



Comprehensive Surface Water Management Plan Update

2015-2021



August 2015

**COMPREHENSIVE SURFACE WATER
MANAGEMENT PLAN UPDATE**

2015-2021

City of Mukilteo

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Management Plan Update

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Mayor: Jennifer Gregerson

Mukilteo City Council: Bob Champion, Council President
Randy Lord, Council Vice President
Christine Cook
Linda Grafer
Steve Schmalz
Emily Vanderwielen
Ted Wheeler

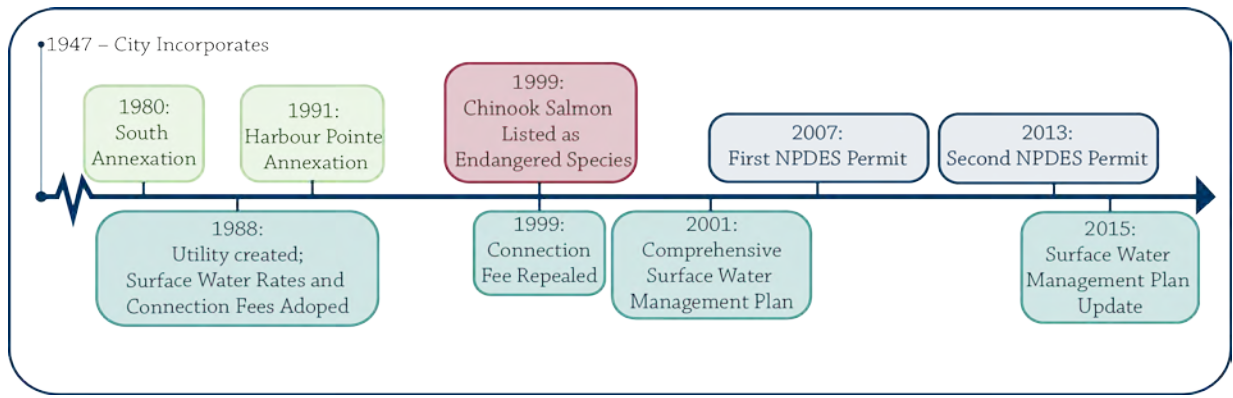
City Staff: Rob McGaughey, Public Works Director
Andrea Swisstack, Assistant City Engineer
Challis Stringer, Senior Engineering Technician
Jennifer Adams, Surface Water Technician

Consultant Team: Brown & Caldwell
ESA
Aspect Consulting
AltaTerra Consulting

Citizen Advisory Committee: Christina Bandaragoda
Iain Draper
Andy Higgins
Eric Hovland
Sylvia Kawabata
William McCredie

Chapter 1: Introduction

1.1 Evolution of the Surface Water Program



Mukilteo's Surface Water Drainage Utility was formed in July 1988 by Ordinance 611, under the authority granted by Chapter 35.67 of the RCW. In 2001, the first Comprehensive Surface Water Management Plan (2001 Plan) was written. The 2001 Plan studied the physical and hydrologic characteristics of the City's 13 watersheds, identified drainage problems, and made programmatic recommendations. Since the formation of the Utility and the 2001 Plan, the way in which surface water and stormwater are managed has changed on both a regional and national scale. There is now a clearer recognition of stormwater impacts to natural resources and aquatic species.

Historically, the goal of stormwater management was to move stormwater off a property as quickly as possible through a series of pipes and, eventually, to a natural water body. This method of stormwater management has proven to degrade natural waterways. Increased peak flows scour and incise stream channels, and contribute to instream instability. Reduced summer flows, through loss of storage and recharge areas (wetlands and groundwater sources, for example), also contribute to loss of flows during summer months.

**Surface Water and Stormwater:
What is the difference?**

Surface water is all the water at the surface of the landscape – streams, lakes, ditches, ponds, and stormwater. Stormwater is a subset of surface water. Stormwater is precipitation that flows off the landscape during or immediately after rain or snow events.

Hard surfaces, like roads and roof tops, change the timing and rate of stormwater flows. Stormwater also picks up pollutants and carries them to surface waters. These altered flow patterns and pollutants on the landscape create problems in the City's streams and Puget Sound.

Pollutants enter our surface waters when stormwater picks up sediment and oils from roadways, washes excess nutrients off fertilized lawns, and then carries these pollutants to our streams and Puget Sound.

In the Pacific Northwest, some of the direct impacts to aquatic habitat are seen as a decline of local salmon populations. In 1999 the Puget Sound Chinook salmon was listed as a threatened species under the Endangered Species Act (ESA). This listing resulted in widespread regional surface water management changes in order to prevent the further decline of the species, and to promote salmon population recovery.

Because there is a better understanding of the drivers of

habitat loss and degraded water quality, surface water programs are moving toward on-site stormwater management. For the region, low impact development (LID) methods (including methods that infiltrate stormwater and retain it onsite before being released to receiving waters), have become mandatory for development projects. The goal is to protect our surface waters from pollutants and to mimic a more natural hydrology by managing stormwater as a renewable resource, rather than a waste product.

The City's Surface Water Utility remains committed to preserving the City's freshwaters and Puget Sound to meet the criteria for all beneficial uses of these valuable resources. This commitment is portrayed in programs that reduce flooding by attempting to mimic natural flow patterns, reduce pollutant loads to stormwater, and provide technical assistance to residents and developers in best management practices for stormwater.

1.2 Need for the Plan Update

There are five areas of need to be addressed in this update.

- 1) A reevaluation of the City's accomplishments and changing stormwater needs in the past 14 years.

- 2) An assessment of new and growing regulatory requirements, and the City's capacity to meet those requirements.
- 3) A new definition of goals and performance measures for the Utility.
- 4) A method to conduct proactive watershed planning, including an asset management component.
- 5) An analysis to assure that the surface water utility rate supports a defined level of service.

1.2.1 Accomplishments and Changing Needs

Since the 2001 Plan was written, the City has:

- Completed a number of capital improvement projects identified in the 2001 Plan.
- Adopted surface water management ordinances, including enforcement mechanisms.
- Adopted a Stormwater Design Manual.
- Enhanced the Public Education Program.

The City has made progress in meeting some of the identified needs of the 2001 Plan. As noted in Section 1.1, stormwater management methods and techniques have shifted since the 2001 Plan. This Update considers past accomplishments and the changing approach to stormwater management.

Currently, the City manages over 55 miles of stormwater pipe, 4,700 catch basins, and 120 water quality and/or flow control facilities. The City has many areas of localized flooding, and has experienced recent catastrophic failures in its aging infrastructure. In 2014, over 47 problem areas were identified by City residents and City staff. To complete only eleven of the most pressing projects would require an estimated \$26 million. While a few of these projects may qualify for outside funding, the majority will need to be funded by the City's Surface Water fund.

1.2.2 Regulatory Requirements

While the 2001 Plan anticipated changes to stormwater regulations, there was not yet a National Pollutant Discharge Elimination System Phase II Municipal Stormwater

Permit (NPDES Permit). The NPDES Permit requirements help support the Utility's goal in preserving our freshwaters and Puget Sound. The first NPDES Permit came into effect in 2007 and a second issuance became effective on August 1, 2013.

An analysis to assure that there is capacity to meet these requirements is warranted. Permit requirements have increased efforts in operations, including higher frequency facility inspections. Development standards and development project review requirements have also changed, requiring more staff review time.

Many of these changes are beneficial to the City. The program changes can allow the City to be more proactive in protecting water quality and maintaining stormwater infrastructure. Identifying maintenance needs on a proactive level can be more cost effective than responding in a reactive mode. However, current City staffing levels and equipment may not support the workload associated with performing many of these new responsibilities.

1.2.3 Define Goals and Performance Measures

Clear performance measures give an understanding of expectations for the Utility. Through annual evaluation of the performance measures, the Utility will be able to recognize whether programmatic changes may be required to meet performance goals. This is a new addition since the 2001 Plan.

1.2.4 Conduct Proactive Watershed Planning

The City has begun some proactive watershed planning with the original hydrologic analysis in the 2001 Plan, the *Mukilteo Watershed-Based Stormwater Strategies Plan* (ESA 2013) (*Strategies Plan*), and the *Mukilteo Stormwater Retrofit Project Identification and Prioritization Report* (ESA 2014) (*Retrofit Project*). Some implementation strategies have been explored under the *Strategies Plan* through a grant from the Washington State Department of Ecology (Ecology), however, a more comprehensive assessment to operationalize the *Strategies Plan* is recommended.

Low impact development methods relying on infiltration have proven challenging in Mukilteo due to underlying geology and the presence of steep slopes. An understanding is needed of where infiltration will safely work and where other solutions are warranted. Mukilteo is committed to low impact development, but site evaluations may prove that underlying geology combined with landslide hazard areas severely limit areas of feasibility, as was the case in the pre-design field investigations done for the Retrofit Project (ESA, 2015) (Retrofit Pre-Design Report). More information on the Retrofit Project can be found on the City's website page at <http://www.ci.mukilteo.wa.us/Page.asp?NavID=336>.

The City's aging stormwater infrastructure should be evaluated. Some of this infrastructure may date back to the turn of the 20th century. The average life expectancy for stormwater infrastructure is 50 years. Most of the Utility's pipe network has not been systematically inspected, and the condition of the infrastructure is unknown. From recent emergency capital projects, it is known that some of the infrastructure is reaching the end of its useful life. A good tool to forecast a maintenance and replacement schedule is via video inspection. Information from this evaluation should be incorporated into a proactive watershed planning process.

Through a proactive and comprehensive watershed planning process, the Utility should be able to target approaches that address specific problem areas. Ecology is currently drafting guidance on a Stormwater Control Transfer program. This program will be an alternative way to manage stormwater under NPDES Permit requirements for flow control and low impact development. The program will allow jurisdictions to target priority watersheds and direct actions to those watersheds to achieve a more immediate benefit. Jurisdictions must get Ecology approval prior to implementing this alternative program. By identifying priorities and directed actions, the City will be poised to take advantage of this new program.

1.2.5 Surface Water Utility Rate

The Surface Water Utility fee should provide the financial resources needed for the Utility to meet its commitment by managing polluted runoff, providing outreach to local

residents and businesses, and maintaining the City's stormwater infrastructure. The Utility should fund all maintenance and operations of the utility (including federal and state requirements) as well as fund capital projects that will repair and/or improve the City's stormwater system and improve surface waters, as they relate to stormwater impacts.

Currently, residential properties in the City of Mukilteo pay \$7.85 per month per equivalent residential unit (the base rate charged to a single family residential property) in surface water utility fees. This rate has remained unchanged since 2006.

This SWMP Update is needed to guide the City's Utility considering the above mentioned factors.

1.3 Goals for the Plan Update

The goals for the Plan Update are to:

- Serve as a management tool to more efficiently manage the capital and maintenance and operations (including NPDES permit compliance) programs of the Surface Water Utility for the next five years.
- Evaluate level of service and existing staffing levels to identify gaps between those required and recommended level of service and staffing levels.
- Evaluate Utility expenses and project surface water management fees for the next five years to ensure the financial viability of the Utility.

1.4 Surface Water Utility Program Transformation

The City's Surface Water Management Program began as a small part of the Engineering Division, designed to provide minimal development plan review, and complete capital stormwater infrastructure projects. The needs of the Surface Water Management Program have grown to encompass a more robust set of duties, including: long range operational and planning capacities; environmental education and outreach; and intensive development review and inspections.

The need for additional staff and the tools to develop more purposeful utility programs have grown with the expansion of the Utility responsibilities. The Surface Water Program must adapt to the changing requirements and techniques of surface water management to more efficiently address capital, maintenance, and NPDES Permit compliance.

The following are examples of how the Utility can make this transition:

- Provide a higher level of sophistication in managing the stormwater infrastructure by developing an asset management system, including information gathered from pipe inspections. This provides better information to cost effectively manage the City's aging infrastructure, and maximize the return on the City's investment.
- Manage surface waters on a watershed basis, to identify needs, limitations, and opportunities.
- Better identify the staffing needs, including technical competencies, to support an improved operations and management program, and development review.

1.5 Process for Plan Update Development & Review

Work on the Comprehensive Surface Water Management Plan Update (SWMP Update) began in July 2013. The City engaged Brown and Caldwell for technical assistance and invited public participation on several levels, including a formation of a continuing Citizen Advisory Committee. Two Open Houses, Four City Council Work Sessions and one City Council Meetings were held during the course of the SWMP Update process. An additional City Council Meeting will be held after finalization of the SWMP Update to address Utility rate changes. Table 1-1 gives a brief timeline of the process.

TABLE 1-1: PROCESS FOR SWMP UPDATE DEVELOPMENT & REVIEW TIMELINE

July 2013	RFQ for Consultant Selection Invitations sent for Citizen Advisory Committee
August 2013	Citizen Advisory Committee (CAC) is formed and meets monthly
December 2013	Brown & Caldwell selected through competitive process and approved by Council
December 2013	Surface and Stormwater Problem Identification Survey mailed to all Mukilteo residents
January 2014- January 2015	Brown & Caldwell and subconsultants provide 3 technical reports
May 2014	Surface and Stormwater Problem Identification Survey results compiled
August 2014	Open House held at City Hall Survey results shared Additional citizen input received regarding existing stormwater issues within the City
September 2014	Stormwater Capital Project List created and ranked
September 2014	Council Work Session on Overview of Stormwater Management Plan
April 2015	Council Work Session on NPDES Permit and CIPs
May 2015	Council Work Session on Rate Study conducted by FCS
June 24, 2015	Open House held to present and receive public input on the Draft Comprehensive Surface Water Management Plan Update
July 6-20 2015	Draft SWMP Update posted for public review and comment SEPA review period begins Submitted to Ecology for Review
July 27, 2015	Council Work Session on Draft Comprehensive SWMP Update
September 21, 2015	Comprehensive Surface Water Management Plan Update Adopted by Council Resolution

1.5.1 Technical Support – Consultant Selection

Through a competitive process, Brown & Caldwell was selected as the consultant for the SWMP Update in December 2013. The technical tasks included assistance with ranking drainage issues, evaluation of geomorphic conditions, evaluation of infiltration feasibility, providing planning level cost estimates for up to 10 Capital Improvement Projects (including hydrologic modeling – Appendix E), and a Utility rate analysis.

Prior work completed in support of the SWMP Update included the *Strategies Plan* in 2013. As a follow on to the *Strategies Plan*, and with the support of Ecology funding, the City completed the *Retrofit Project*, including a pre-design report.

1.5.2 Citizen Advisory Committee

The City established a Citizen Advisory Committee (CAC) in the summer of 2013 to ensure an opportunity for public input throughout the entire SWMP Update process. The CAC met monthly and worked with staff to help establish utility policies and priority direction for this SWMP Update. The insightful input and feedback from the CAC on how the SWMP Update might affect Mukilteans helped shaped the final SWMP Update. The Committee originally consisted of seven Mukilteo residents. Six of those residents stayed with the CAC through the 2-year process.

1.5.3 Open House Events

First Open House – Problem Area Identification: On August 26, 2014, an Open House was held at City Hall to discuss the role of the City’s Surface Water Utility, current challenges in stormwater management, and gather public input on stormwater issues within the City. Over 100 residents attended. City staff addressed any questions.

The City presented maps of known stormwater issues (primarily flooding issues) and invited attendees to report additional stormwater issues. An interactive GIS mapping tool was used to more effectively communicate known problems and locations. Information on the operations program and pollution problems was also addressed.

Opportunities to provide comments on stormwater issues electronically or via mail were given through the City's website and through direct mailings. One hundred thirteen (113) response sheets were received by the City. These responses were incorporated into the list of Identified Surface Water Issues (Appendix A).

Second Open House - Draft SWMP Update: On June 24, 2015, a second open house was held at City Hall to present and receive public input on the draft SWMP Update. The SWMP Update was presented in poster board style, including an overview of the Utility goals, operations programs, engineering programs, and the financial analysis. Approximately 12 residents attended. Opportunities for comment were made available at the Open House and on the City's website.

1.5.4 SEPA

The State Environmental Policy Act (SEPA) requires state and local agencies to consider the likely environmental impacts of a proposal before approving or denying the proposal. This process requires an agency to complete an environmental checklist that identifies and describes potential adverse environmental impacts. The checklist is then made available for other agencies and the public to review and comment. The checklist for the draft SWMP Update was prepared and made available for review and comment on July 6, 2015.

A determination of non-significance (DNS) was issued on July 1, 2015 for the SWMP Update. A copy of the SEPA checklist and DNS is included in Appendix B.

1.5.5 Draft Comprehensive SWMP Update Public Review

Concurrent with the SEPA environmental checklist, the Draft SWMP Update was posted on the City's website on July 6, 2015 and made available for public review. The 14-day review and comment period required by the SEPA process began on July 6, 2015. Every comment received during this period was reviewed and responded to by City staff. Comments and City responses are included as Appendix B. Where appropriate, changes generated by the review comments were incorporated into the Final SWMP Update.

1.5.6 City Council Work Sessions and Meetings

During the course of the SWMP Update, City staff communicated with City Council at four Work Sessions. The goal of these Work Sessions was to provide City Council with information on the process for and the drivers of the SWMP Update, including NPDES permit requirements, identified capital projects, and the proposal for a proactive management approach.

TABLE 1-2: COUNCIL WORK SESSIONS DATES AND TOPICS

Date	Work Session Topic
September 8, 2014	NPDES Permit requirements and their impacts to the Surface Water Program
April 13, 2015	Review programs and operational areas that impact Utility expenses, including NPDES permit requirements, results of an internal NPDES Permit gap analysis, and the list of proposed Stormwater Capital Improvement Projects (CIPs) (Chapter 6).
May 11, 2015	Current surface water utility rates, current and future expenses, and proposed funding strategy for the next five years. Four different rate scenarios were presented by FCS, the City's consultant. Pros and cons of each scenario were discussed
July 27, 2015	Draft SWMP Update Review

Adoption of the SWMP Update is scheduled to occur at the regular City Council Meeting of September 21, 2015. A Public Hearing on the surface water rates is scheduled to occur at a Special City Council meeting of November 9, 2015, followed by formal adoption of Ordinance 1372.

Chapter 2: Watershed Characteristics

The City of Mukilteo is in western Snohomish County on the eastern shore of Puget Sound, between Seattle and Everett (Figure 2-1). It is just over 6 square miles in area. The City is unique in that it has 14 separate fresh water streams and the Puget Sound within its boundaries. These natural features contribute to the high quality of life that Mukilteo residents enjoy. With an understanding of how these water bodies function, and the storm drainage network that contributes to them, the Utility can weigh the potential impacts to the waterbody and make more informed management decisions. A discussion of the current understanding of Mukilteo's surface waters, stormwater infrastructure, natural resources, and geologic conditions follows.

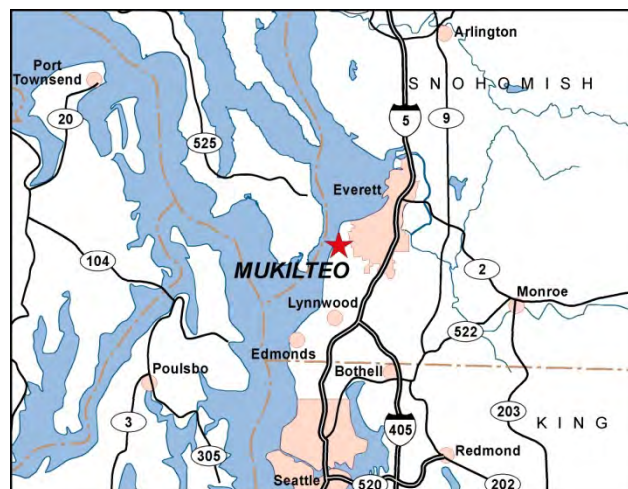


FIGURE 2-1: MUKILTEO VICINITY

2.1 Natural Drainage Basin Characteristics

2.1.1 2001 Watershed Delineation

The City first delineated 13 drainage basins in the 2001 Plan, all of which discharge to Puget Sound. The 13 contributing basins were given basin letters along with the stream names. For example, Basin H contributes to Big Gulch stream. At that time, all of the basins were named, with the exception of Basin E. It has since been named Olympic

View. A City-wide hydrologic analysis was completed for each watershed at that time. Because there were often data gaps on the stormwater infrastructure, topography was often used as a proxy in developing the hydraulic models.

2.1.2 2013 Watershed Delineation

In 2013, as part of the *Strategies Plan*, the basins were re-delineated, using updated mapping of the stormwater network and better local understanding of the basin boundaries. The 2013 delineations encompassed entire drainage basins in order to obtain a complete understanding of the contributing areas. This means that some areas outside of Mukilteo were included in the analysis. As a result of a stormwater pond on the airport, the current mapping shows Swamp Creek as part of the City's inventory. However, that mapping is incorrect. The pond is piped to Big Gulch. The maps will continue to be updated as they are field verified. Table 2-1 outlines the differences in basin areas from the 2001 Plan compared to the 2013 *Strategies Plan*.

TABLE 2-1: BASIN AREA COMPARISONS

	2001 Plan	2013 Study
BASIN NAME (2001 basin ID)	BASIN SIZE (ACRES)	
Big Gulch (H)	1600	1550
Brewery Creek (C)	292	304
Chennault Beach (I)*	125	184
Upper Chennault (J)	145	278
Lower Chennault (K)	507	337
Edgewater (A)	360	340
Goat Trail Ravine (D)	274	382
Hulk Creek (L)	280	375

Japanese Gulch (B)**	615	1149
Naketa Beach (F)	164	160
Olympic View (E)	262	173
Picnic Point Cr (M)	1455	1417
Smugglers Gulch (G)	293	332
*placed portion in Big Gulch in 2013		
**additional acreage mapped is largely outside Mukilteo		

A map of the current watershed delineations is found in Figure 2-2.

In 2014, four stream channels (Brewery Creek, Upper Chennault Creek, Lower Chennault Creek and Smugglers Gulch Creek) were evaluated with regard to the potential for influence of stormwater management actions as part of the *Geomorphology and Critical Slope Evaluation*, (Geomorphic Study) (Appendix C). As part of that effort, a stream walk was conducted for each of the four basins.

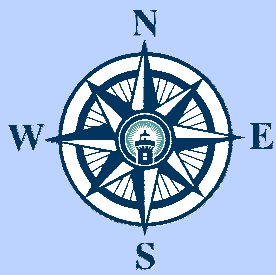
All of the streams or stream segments within the City are fairly small (classified as 1st order in the Strahler system) with many of the drainages beginning in low gradient headwaters (the plateau area) and becoming steeper in the ravines, before discharging to the Puget Sound. Edgewater, Japanese Gulch, and Big Gulch, and small portions of Smugglers Gulch and Brewery Creek have headwaters that lie outside of Mukilteo. Goat Trail Ravine, Olympic View Ravine, Naketa Beach, Chennault, Upper Chennault, and Lower Chennault lie entirely within Mukilteo; with the exception of the outfalls. All streams discharging to Puget Sound cross over the Burlington Northern San Francisco Railroad jurisdiction at some point. Brewery Creek, Edgewater Creek and Japanese Gulch cross under the railroad tracks, but have some piped flow path between the BNSF right-of-way and the Puget Sound. The outfall pipes of the remaining 10 Puget Sound streams lie under the BNSF right-of-way.



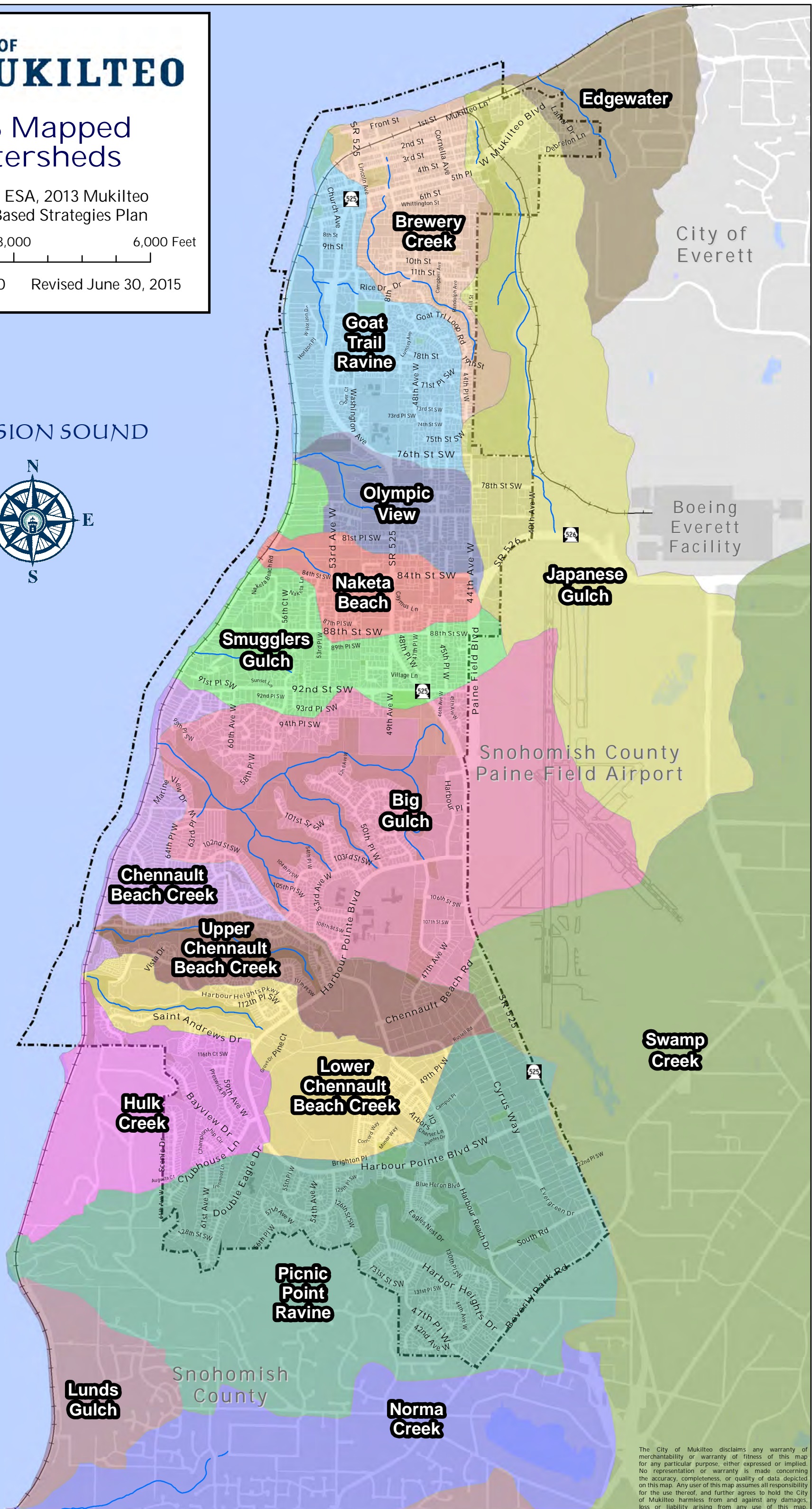
2013 Mapped Watersheds

Data Source: ESA, 2013 Mukilteo Watershed-Based Strategies Plan

Scale = 1:24,000 Revised June 30, 2015



POSSESSION SOUND



The City of Mukilteo disclaims any warranty of merchantability or warranty of fitness of this map for any particular purpose, either expressed or implied. No representation or warranty is made concerning the accuracy, completeness, or quality of data depicted on this map. Any user of this map assumes all responsibility for the use thereof, and further agrees to hold the City of Mukilteo harmless from and against any damages, loss or liability arising from any use of this map.

2.1.3 Watershed Processes

In-stream hydrology is driven by rain events and the condition of the surrounding watershed (for example: geology, effective impervious surface, and tree canopy cover). When rain falls in forested conditions, the vegetation and soils provide water storage. When the land is converted to impervious areas, groundwater recharge is diminished and surface flows are increased. During the dry summer months, the lack of recharge results in decreased stream base flows, which translates to dry streambeds. In winter months, during heavy rain events, surface flows reach streams more quickly and with higher peaks, which translate to scoured stream beds, and undercut ravines.

FIGURE 2-3: HYDROLOGY OF PRE-DEVELOPED CONDITIONS

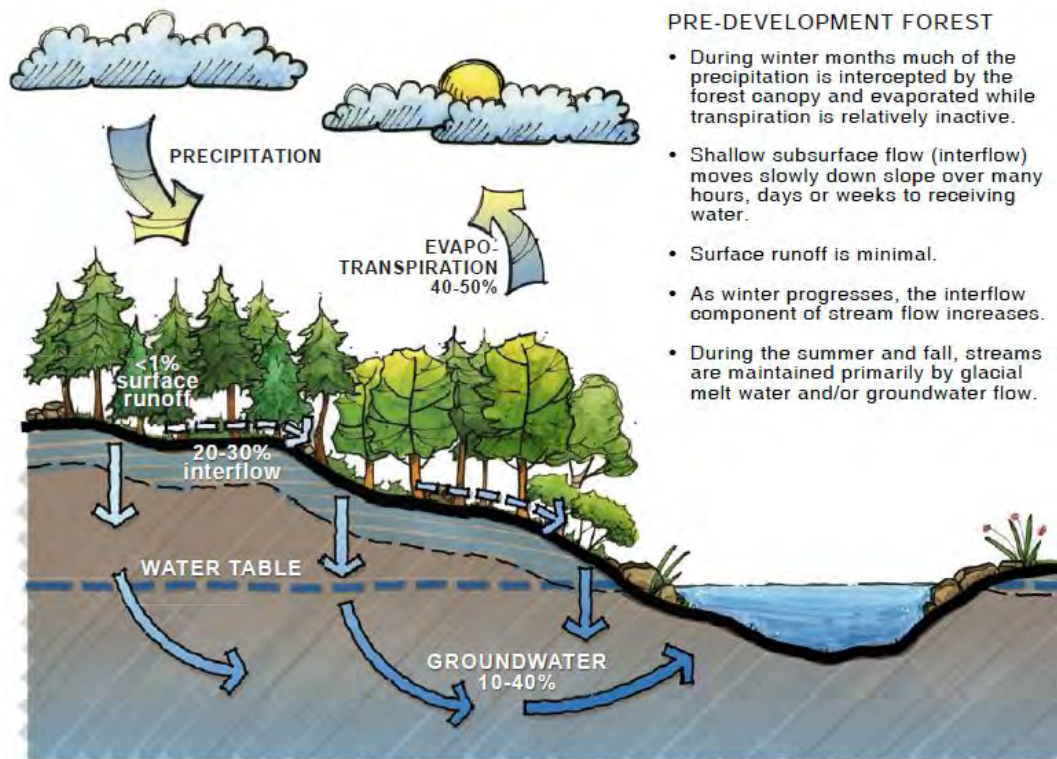
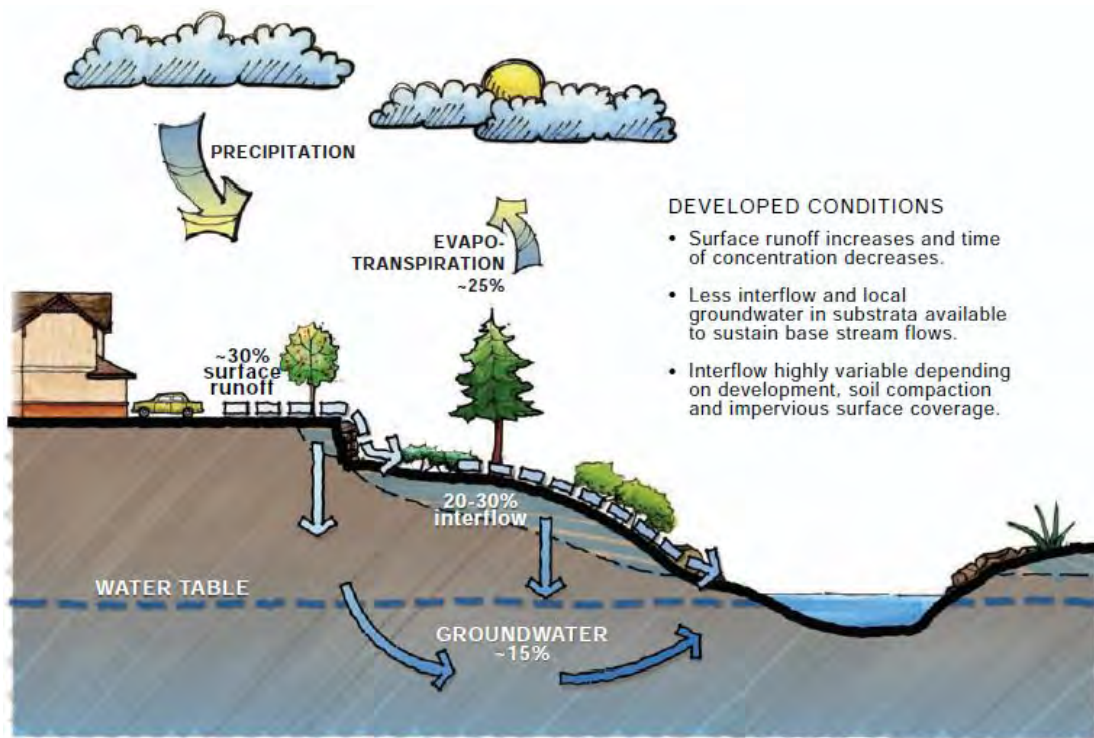


FIGURE 2-4: HYDROLOGY OF DEVELOPED CONDITIONS



The 2013 *Strategies Plan* is based on how watershed processes change in relation to the stream's position on the landscape. Typically, plateau areas are important for storage and recharge. Bluff areas and ravines are important for recharge and discharge. Because Mukilteo's streams are very short in length and much of the surrounding watersheds are developed, the streams respond quickly to heavy rain events. Several of the streams have cut deep ravines and gullies through the underlying glacial deposits.

Recharge processes are an important component to preserving and restoring watersheds. These processes are influenced by groundwater movement, especially in the plateau areas. However, groundwater movement is not well understood in Mukilteo. Because of this, the *Strategies Plan* was unable to evaluate recharge processes as part of their analyses for any of the basins. If recharge is an important driver for the basin, it would not have been identified in the *Strategies Plan*.

2.1.4 Instream Flow Impacts

Many of the drivers of drainage problems discussed in the 2001 Plan remain the same today. The conversion of forested landscape to an urbanized setting changes flow patterns in surface waters. Problems such as increased stream bed scour, sediment loading, increased pollutant loading, and localized flooding are common in urban areas as a result of the conversion of soil and vegetation to impervious surfaces. Urban development results in converting previously forested land to large impervious areas such as roof tops, driveways, parking lots, and roads. This converted landscape results in increased peak flows and reduced base flows.

2.1.5 Water Quality Impacts

Urbanization also impacts water quality. Pollutants such as copper from car brake pads, oils from leaking vehicles, soapy car washing, herbicides, pesticides, and others are deposited on lawns and impervious areas. When rain water falls on these impervious surfaces, it picks up the pollutants and carries them directly to the streams. In addition, anything that is accidentally spilled or purposefully poured into the storm drain system directly impacts surface waters.

The City does not test any streams for water quality. However, Snohomish County has been monitoring Picnic Point Creek over several years for Benthic Index of Biotic Integrity (B-IBI). B-IBI uses in-stream biological communities as an indicator of the health of the stream. When the biotic communities are depleted or not robust, it is an indicator that there is an impairment to the stream. The types and ratios of biota can help determine what is driving the impairment. Snohomish County's B-IBI testing shows two sampling events with low scores, leading Department of Ecology to recommend listing Picnic Point Creek as an impaired water body. As such, in 2015, Ecology recommended putting Picnic Point on EPA's 303(d) list for impaired water bodies. Snohomish County takes exception to this proposed listing, and provided comment to that effect. Additionally, the City of Everett does water quality sampling in Japanese Gulch.

2.1.6 Stormwater Solutions

Stormwater's impact on natural drainage basins can be mitigated to some extent through best management practices during development. Many stormwater solutions are currently moving toward infiltration as a preferred (and required) alternative. The intention is to restore recharge processes and slow the peak flow rates during heavy rain events. Infiltration through a soil column has also proven to reduce some pollutant loads to receiving waters. These methods should improve natural drainage basins. However, challenges for infiltration solutions are not applicable everywhere in Mukilteo (See Section 2.4 for further discussion).

2.2 Stormwater Infrastructure

The City's stormwater system is a network of pipes, catch basins, swales, ditches, flow control facilities and water quality facilities. The stormwater conveyance systems ultimately discharge to a stream or to Puget Sound (the receiving waters). This built infrastructure requires maintenance, repairs, and replacement over time in order to preserve its function, but also to protect the receiving waters.

2.2.1 Conveyance

- *Pipes.* The City has mapped approximately 55 linear miles of stormwater pipe 12" or greater in diameter (not included privately owned pipes) within the City's current boundaries. Pipes are basic conveyance systems. They provide no flow control or water quality. Once stormwater is directed to a piped infrastructure, it is carried downstream.
- *Culverts.* The City has mapped 114 culverts, totaling 8,823 feet. These are most likely undercounted in the City's mapping, because many culverts under private driveways would not be included in large scale mapping. Culverts are generally defined as a structure (typically pipe or concrete box) that drains open channels, swales or ditches under a section of roadway or embankment. As examples, culverts can pipe sections of stream under roads, or pipe sections of ditch under driveways.

- *Ditches.* The City has mapped 270 ditches, totaling 7.2 miles. Like pipes, ditches provide stormwater conveyance, moving water downstream. An advantage to ditches is they can provide some water quality treatment as flows pass through vegetation and / or discharge to groundwater, providing recharge.
- *Swales.* The City has mapped 29 swales. Swales are designed to infiltrate water as the primary purpose, with some water also discharging downstream.
- *Catch Basins / Inlets.* The City has over 4,700 catch basins and inlets mapped within the City's boundaries. These are the drains, visible on the surface, often in the right of way (Figure 2-5). Inlets capture stormwater and move it into the stormwater system. Catch basins can also have a sump to capture pollutant-laden sediment.

FIGURE 2-5: CATCH BASIN IN RIGHT OF WAY



2.2.2 Stormwater Flow Control and Water Quality Treatment Facilities

The City is responsible for 115 known stormwater flow control and/or water quality treatment facilities. There are as many as 100 additional privately owned flow control and/or water quality facilities. While the City is not responsible for maintaining privately owned systems, they do contribute to the overall function of the stormwater network.

Flow control facilities are engineered to release high flows at a slower rate. Water quality treatment facilities can be as simple as an oil/water separator that suspends oil at the top, for easy recapture in the event of a spill. Other water quality treatment

facilities include bioinfiltration facilities, where the stormwater is filtered through a soil media; or other proprietary treatment technologies. Facility types that the City owns include: detention vaults, detention ponds, detention pipes, and bioretention facilities.

The City has two regional detention facilities: a centralized regional detention facility around Harbour Pointe Golf Course and small interspersed wetlands throughout the Harbour Pointe area. The Golf Course regional facility is a collection of manmade ponds and wetlands joined by a network of creeks and swales. A list of the known City operated facilities is included as Appendix F. This list is currently under review to verify accuracy, and is subject to change. The City has many design plans for previously installed privately owned facility, but does not currently have them mapped or have a cataloged list.

2.2.3 Hydraulic Modeling

Hydraulic modeling was done for 13 watersheds as part of the 2001 Plan in order to identify areas with potential lack of capacity in the stormwater network. Basin scale hydraulic modeling was completed for Brewery Creek in 2014 as part of the Mukilteo Lane CIP project. Targeted hydraulic models were updated in 2014 as part of the CIP Summary Description and Cost Estimates (CIP Costs) (Appendix E), and as part of the work for the Retrofit Project completed in 2015.

2.3 Related Natural Resources

2.3.1 Shorelines

In 2011, the City adopted a *Shoreline Master Program* (SMP) (City 2011). The SMP identified three shoreline segments within the City's current boundaries (Segment A, Segment B, and Segment C). These segments total 4.9 miles and were classified based on broad levels of ecosystem function and existing land uses within the segments. Two additional segments within the Mukilteo Urban Growth Area (MUGA) were also identified based on ecosystem function and land uses (Segment D and Segment E). Segments A through D are all marine shorelines; Segment E is Lake Serene Shoreline.

Each segment has identified land use, critical habitat, and public access components. Further, work was done to identify potential opportunities and potential constraints within each segment. The City's surface water programs should help support opportunities in shoreline areas that also serve to improve surface water functions. Known projects are incorporated into the Utility's ranked CIP list.

2.3.2 Mapped Floodplains

The 2011 SMP identifies only a small area within the 100-year floodplain within the City. The floodplain is found within and around Mukilteo Lighthouse Park and the Urban Waterfront Area of downtown.

2.3.3 Wetlands

There are 142 mapped wetlands, totaling 163.7 acres, in the City. (This covers approximately 5% of the City's total area.) In addition to these wetlands, the City has designated 29 "dual function" wetlands, totaling 30.2 acres. These dual function wetlands are used to manage stormwater runoff. It is often the case that wetlands are not accurately mapped. As a result, the City's maps may underestimate the total wetland area.

Wetlands provide numerous ecological functions to the City, including water quality improvement, floodwater storage, fish and wildlife habitat, aesthetic value, and biological productivity. Not all wetlands perform the same functions or at the same level. However, taken together, these are important surface water components on the landscape. Over time, many of the City's wetlands have been replaced with developed land uses. The City's Wetland Regulations (Municipal Code Chapter 17B.52B) help protect important wetlands.

Historically, there is evidence that some estuarine wetlands existed at the outfalls of creeks, such as Japanese Gulch and Brewery Creek. These have since been piped and the hydrology no longer exists to support the wetland (SMP, 2011). The Waterfront Master Plan envisions daylighting these two outfalls, with the possibility of re-

establishing some estuarine wetland functions. These are currently unfunded projects through the Surface Water Utility.

2.4 Geologic Conditions

2.4.1 Geology / Topography

Puget Sound regional topography and geologic formations were shaped by long cycles of erosion and non-glacial sedimentation, punctuated by multiple glacial advances into the Puget Sound lowland. The glacial deposits are derived from several regional glaciations; the most recent, called the Vashon Stade of Fraser glaciation, ended about 13,000 years ago. These glaciers sculpted the landscape, and waterways of Puget Sound. Post-glacial erosion has locally incised the area, creating steep-sided ravines and steep bluffs in coastal areas. Human alterations and activities also influence the existing geologic processes.

The shape of the land defines where runoff goes. Its soils and geology define how fast it gets there. Many of the City's watersheds begin in broad upland plateaus, notably the areas around Harbour Pointe and Paine Field. These plateaus quickly drop through Mukilteo's hilly topography, sloping west and north toward Puget Sound. Many of the hills terminate in bluffs and steep slopes overlooking the Sound. Running through this landscape are many wooded gulches and streams.

The makeup of the soils determines the amount of stormwater infiltration and runoff. The shallow permeability of soils derived from till deposits are moderately rapid in weathered zones and very slow through unweathered, hard glacial till. It is very common for water to infiltrate the surficial, weathered till, and then 'perch' on the underlying unweathered layers, flow laterally, and resurface as springs on slopes, or creek banks. Additional stormwater input to these slope and streambank springs add to the burden on landslide areas.

The primary surface soil type in the Mukilteo area, as shown in the U.S. Soil Conservation Service (SCS) Soil Survey for Snohomish County, is in the Alderwood

series, derived from glacial till. Drainage is restricted by the underlying geology, the Vashon Till, so this soil is classified as generating moderately high runoff. The combination of the moderately high runoff and the steep marine bluffs creates many areas of high landslide hazards.

Mukilteo has published a landslide hazard map (Ordinance 987, 6 March 2000) which shows steep areas in three categories:

- Moderate Landslide Hazard: areas with 15-40 percent slope underlain by sand, gravel bedrock or till
- High Landslide Hazard: areas with 15-40 percent slope underlain by silt and clay and any area with slope greater than 40 percent
- Very High Landslide Hazard Area: areas of known landslide deposits

In addition to landslide hazards along Puget Sound bluffs, the geologic and soil characteristics can affect the volume of runoff and the erosive potential of streambanks. Because many of Mukilteo's streams flow through steep ravines, the potential for landslides also exists around steep stream channels.

2.4.2 Impact of Underlying Geology and Landslide Hazards on Infiltration as a Stormwater Management Technique

The City is committed to implementing all stormwater management techniques that will work to preserve our surface water quality and habitat, including infiltration, where feasible. In an effort to better understand where infiltration as a stormwater management technique will work, the City conducted studies to gain a more complete understanding of the City's geology. The updated geologic information from the 2014 Mukilteo reconnaissance is especially important as it relates to infiltration potential and implementation of low impact development (LID) stormwater solutions. Both shallow and deep infiltration potential were considered as options in the City.

Shallow infiltration relies on stormwater moving vertically through a soil column in a LID facility (such as bioretention) and would be best applied in the City's plateau (flat)

areas. Shallow infiltration requires surface soils to be relatively permeable and some separation to the groundwater table (1-foot separation for small facilities and 3-foot separation for larger facilities).

Deep infiltration does not require permeable surface soils. Instead, the water can be carried through impermeable surface soils to deeper permeable layers. These types of facilities are generally more expensive to construct and require approval from Ecology's Underground Injection Control (UIC) program. (UICs are not required as part of development.)

Field reconnaissance during the Geomorphic Study was conducted in four drainage basins. The reconnaissance showed that the Vashon advance glacial outwash (the Qva layer) is both thinner and more laterally restrictive than indicated on the DNR maps. In some areas, the advance outwash was entirely missing. As a result of an evolving understanding by geologists of geologic units and recent seismic movements, previously understood descriptions and State Department of Natural Resources' (DNR) 2014 maps may be inadequate to describe conditions in Mukilteo.

As an example, from the DNR maps, it was thought that the geology in the Brewery Creek basin included an extensive layer of Vashon advance glacial outwash (the Qva layer), suggesting an infiltrative layer. The impermeable layer of silty and clayey beds (Qtb layer) appears to match the general extent of the DNR maps. However, the field work indicates that the Qva layer is much thinner (50 feet as opposed to 150 feet) than first mapped; and may be only locally present. This sparse coverage of an infiltrative layer reduces potential areas for stormwater infiltration techniques. The City will continue to explore infiltration opportunities through site specific PITs, as required by the *Stormwater Management Manual for Western Washington*.

Originally, it was assumed that there would be an advance outwash available for deep infiltration potential, somewhere between 350 and 400 feet. Based on reconnaissance and localized boring efforts, this assumption was revised to assume that, if present, the advance outwash is deeper than 350 feet or possibly already saturated.

Additional work in the *2015 Mukilteo Infiltration Feasibility Assessment* (Infiltration Assessment) (Appendix D) groundwater, combined with facility size and lateral permeability out of the facility sides, can cause mounding on the glacial till. Mounding can reduce the infiltration capacity of an LID facility over the longer term stormwater loading. These findings may further restrict (in conjunction with steep slopes) locations where infiltration is feasible.

The Infiltration Assessment also found that “Most of the City is not suitable for shallow infiltration due to the presence of low-permeability glacial till soils at the surface and/or proximity to steep slope hazards including landslides. There are small areas considered moderate to good for shallow infiltration throughout the City.”

Based on the findings of the Infiltration Assessment, and through evidence of the City’s Pilot Infiltration Tests and borings, opportunities for infiltration appear to be limited in Mukilteo. Steep slopes (over 20%) and their associated 50 foot buffer in Mukilteo cover approximately 25% of the City. (Infiltration is not recommended within 50 feet of steep slopes). As the City has explored areas for infiltration through PITs, there is ever-growing evidence of an impermeable glacial till (PIT infiltration rates of zero are reported). Groundwater movement, even if over 50 feet away from steep slopes, might still impact landslide hazard areas, but it is not well understood how.

Because the recharge process and how groundwater affects steep slopes are vital to identifying solutions for many of the impacts on natural drainage basins, the City should explore these processes further. The City needs to understand the effects of infiltration on steep slopes, exhaust opportunities for infiltration projects, and/or begin to identify alternative solutions. Some exploration work was completed with the Retrofit Project in 2014. This work should be expanded through a Basin Planning process (See Chapter 7).

Upon review of the Infiltration Assessment, Ecology commented that “the presence of glacial till does not in itself make a site infeasible for LID” under new development and redevelopment requirements. Ecology additionally cautioned that even though the Infiltration Assessment provides a baseline understanding of the City’s geology, that this

does not “take the place of the required site specific investigations required as part of new and redevelopment requirements under the current [NPDES] permit.”

As stated previously, the City is committed to exploring infiltration options to solve stormwater issues, and will continue to follow the regulations for site-specific exploration for new development and redevelopment. The City’s initial assessment indicates that many areas may require more creative solutions to these problems.

Chapter 3: Environmental and Regulatory Factors

The City of Mukilteo's surface water program must comply with a number of state, federal, and local regulations that are pertinent to stormwater. Based on ongoing research related to stormwater runoff impacts on water quality and to native fish populations, the regulations have become more stringent.

3.1 Federal Clean Water Act – NPDES Phase II Municipal Separate Storm Sewer Permit

As authorized by the Federal Clean Water Act, the NPDES Permit is a federal requirement that regulates stormwater and wastewater discharges to waters of the United States. In Washington State, the NPDES Permit program is administered by Ecology. In Western Washington, the Phase II permit requires at least 80 Municipal Separate Storm Sewer System (MS4) operators with populations under 100,000 to implement programs and practices to control polluted stormwater runoff.

In the City of Mukilteo, all stormwater is discharged to surface waters or waters of the state (ground water is included and regulated by Ecology in the State of Washington). Municipalities are required to obtain NPDES permits if their stormwater discharges go directly to surface waters. The programs and practices are clearly spelled out in the Permit (Ecology 2013). By implementing these programs, the municipalities are allowed to continue to discharge stormwater to surface waters.

The first Phase II NPDES Permits were issued in 2007, and the City has operated under a Phase II Permit since that time. The current Phase II NPDES Permit was effective on August 1, 2013 and runs through July 31, 2018. It is expected that another 5-year permit cycle will become effective in August 2018. It is unknown at this time what will be required under any upcoming permits.

3.1.1 Current Permit (2013 - 2018)

The City of Mukilteo is covered under a NPDES Phase II Municipal Stormwater Permit issued by Ecology. The permit has five required program elements under Section 5:

1. Public Education and Outreach
2. Public Involvement
3. Illicit Discharge Detection and Elimination (IDDE)
4. Runoff Controls for New Development, Redevelopment and Construction Sites
5. Municipal Pollution Prevention, Operation and Maintenance

Other requirements include administrative duties, participation in monitoring programs, and coordination with other jurisdictions. While the Permit went into effect in August of 2013, the Permit itself phases new program implementation requirements through July of 2018 (the five-year permit term). This phasing allows jurisdictions to plan and prepare for the new requirements and allocate the appropriate staffing and equipment necessary to meet compliance. Table 3-1 summarizes major components of the permit and the associated deadlines for meeting those components.

Each year, Permittees must complete activities to meet Permit requirements, and complete annual reports on those activities. These documents are made available to the public on the City's Surface Water Management web page. The activities vary in complexity and length of time to complete. The activities can effect entire City operations. Some are ongoing, some activities are one-time actions, and others require new program implementation.

3.1.2 Future Permit Cycles (2018 and beyond)

It is anticipated that Ecology will start drafting the next permit cycle in the next two years. Ecology follows a public review process, at which time City staff will review the proposed requirements and provide comment as necessary. City staff will continue to communicate with Ecology and prepare for any new requirements that may stem from future permit cycles. Additionally, staff will remain engaged in local work groups that help to shape permit requirements.

TABLE 3-1: WESTERN WASHINGTON PHASE II MUNICIPAL STORMWATER NPDES PERMIT OVERVIEW – 2013 TO 2018

S5 Program Component	August 1, 2013 Ongoing program implementation		2014	2015	2016	2017	Jan-July 31, 2018
A. Stormwater Management Plan	Continue to track costs, actions and activities. Continue required internal and suggested external coordination and SWMP Plan submittal w/annual report. Update SWMP Plan annually.			By March 31: annual rpt includes description of internal coordination			
C.1 Public Education and Outreach	Continue public education and outreach program. Measure changes in behavior for 1 audience & 1 topic.		Create or partner w/others to create stewardship.		By February 2:use measures of behavior changes to improve program.		
C.2 Public Involvement	Continue to provide ongoing opportunities for the public to participate in SWMP decision-making. Post online annual reports and SWMP Plan for previous calendar year by 5/31 of each year.						
C.3 Illicit Discharge Detection and Elimination (IDDE)	Continue implementing the enforceable mechanism to prohibit illicit discharges, compliance strategy, IDDE and municipal staff training, citizen hotline and IDDE response, and maintain map of MS4.					By Dec 31: Field screen at least 40% of MS4 & on average 12% each year thereafter.*	By Feb 2: Update ordinance if needed. Storm system map is complete and maps are kept updated.
C.4.a-f Control Runoff from New Develop't, Redevelop't Construction Sites	Continue to implement ordinance addressing construction/post- construx runoff controls; make NOIs for construction, industrial stormwater permits available; site plan review & permitting, requiring long-term maintenance; inspections; training; and enforcement.				By Dec 31: Update SW code to revised Appx 1 standards; review, revise, make effective development codes to make LID preferred approach. **	By March 31: Submit summary of review & revision of codes to reduce impervious surface, protect vegetation, minimize SW.	Achieve at least 80% of scheduled inspections.
C.4.g Water-shed scale stormwater planning (selected permittees***)	By Oct. 31, 2013 Phase I permittee notifies Ecology of selected basin and affected Phase II permittees***			By Aug 13: Submit documentation of the coordination approach for watershed-scale planning. By Nov. 4: Submit scope of work and schedule for the complete watershed-scale planning process			By Apr.4: Submit final watershed-scale stormwater plan
C.5 Municipal Pollution Prevention, Operation and Maintenance	Continue implementation of MS4 maintenance; annually inspect SW trtmt & flow control BMPs/facilities; spot checks; O&M & SWPPPs for municipal lands & facilities; staff training				By Dec 31: Update maintenance standards to revised manual/ code standards.**	By August 1: Inspect all catch basins or document alternatives if used. Plan to complete inspections every 2 years thereafter.*	Achieve 95% of inspections for municipal stormwater treatment/flow control BMPs/facilities and catch basins.

The timelines provide an overview of major program components deadlines (**By Date** means "...no later than...") for implementing permit requirements of S5 Stormwater Management Program (SWMP) for Continuing City, Town and County Permittees. Other permit elements are listed on the next page. This is guidance only; please see the permit for additional detail and related requirements. [January 2015 version]

S8 Monitoring and Assessment

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

Other significant elements of the permit

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

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

*City of Aberdeen completes requirement by 6/30/2018. Report in fifth year annual report.

**Lewis/Cowlitz county permittees complete requirement by 6/30/2017; City of Aberdeen by 6/30/2018. Report in next annual report.

***Watershed-scale Planning applies to Phase II Permittees within King County's selected watershed: cities of Redmond and Woodinville

3.2 Federal Clean Water Act – Total Maximum Daily Load (TMDL) Plans

Under section 303(d) of the Clean Water Act, states, territories, and authorized tribes are required to develop lists of impaired waters. These are waters that are too polluted or otherwise degraded to meet the water quality standards set for beneficial uses. The law requires that priority rankings and cleanup plans be made for waters on the 303(d) list. Clean up plans often specify a Total Maximum Daily Load or TMDL for the water body. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.

What are “beneficial uses”?

The Washington State Legislature has designated uses for protection in fresh surface waters of the state and Marine waters. Beneficial uses include Aquatic Life and Recreational Uses. Different criteria are set in WAC 173-201A-200 for specific water bodies, based on historic use.

Mukilteo does not currently have any listed water bodies on the 303(d) list. However, as of early 2015, Ecology has presented a proposed 303(d) list of impaired water bodies that includes a Category 5 listing for Picnic Point Creek for biotic integrity. A Category 5 listing requires a cleanup plan such as a TMDL. Department of Ecology usually writes the plans, but the City should be working to identify possible causes of, and solutions for the impairment.

Additionally, the beaches at Picnic Point Creek and Lighthouse Park have history of past advisories and closures due to bacterial contamination, particularly after large rain events. These advisories are not the same as 303(d) listings; however they are an indication of degraded water quality.

3.3 Federal Endangered Species Act

The Endangered Species Act (ESA) provides for both the conservation and protection of plant and animal species that face the threat of extinction as well as for the ecosystems upon which they depend. To prevent further decline of the species and to encourage

restoration, the ESA prohibits “take” of listed animals. Take includes any disturbance of the population, including significantly modifying its habitat.

ESA requires a review of listed species every five years. The National Oceanographic and Atmospheric Administration (NOAA) conducts this review. The most recent status review was completed in 2011. In that review, all West Coast salmon and steelhead species retained their previous listing classifications. This means that for the Puget Sound species, Chinook salmon (*Oncorhynchus tshawytscha*) and Steelhead (*Oncorhynchus mykiss*) were found to be at moderate risk of extinction. Both remain listed as threatened species.

To reflect local conditions, individual Watershed Resource Inventory Areas (WRIAs) were created. The WRIAs develop salmon recovery plans for NOAA’s approval. The City of Mukilteo spans two WRIAs, WRIA 7: Snohomish Basin to the north, and WRIA 8: Cedar-Sammamish Basin to the south. The majority of the City lies within WRIA 8. These are very large WRIAs and are dominated by large river systems, none of which themselves pass through Mukilteo. Instead, the City’s contribution to the WRIAs consists of 13 small coastal watersheds, and one Lake Washington tributary.

In 2001, 27 local governments in King and Snohomish counties, including Mukilteo, signed an Interlocal Agreement (ILA) to create the Water Resource Inventory (WRIA) 8 Forum. The most recent update covers 2007-2015 and jointly funds the development of a conservation plan to protect and restore Chinook salmon.

After the development of the WRIA 8 Chinook Salmon Conservation Plan (the Conservation Plan) in 2005, the WRIA 8 Salmon Recovery Council (SRC) was created to oversee the implementation of the Conservation Plan. In the past, Mukilteo Councilmembers have held positions on the WRIA 8 SRC. Currently the seat is vacant.

3.4 Tribal Agreements Related to Case Law

In March 2013, the U.S. District Court ruled that Washington State is not fulfilling obligations to remove barriers that impede fish movement and thus is violating Tribal

treaty fishing rights. This has become known as the “culvert case,” and requires the State to accelerate its program to upgrade and replace State-owned culverts. If the ruling stands, it is anticipated that future rulings may trickle down and apply at a local level. WDFW shows three culverts with fish presences as total barriers in the City. Two are owned by the State and cross under SR525. The third is owned by the City.

3.5 Hydraulic Code – RCW 77-55 (Construction Projects in State Waters)

WDFW requires a Hydraulic Project Approval (HPA) for construction activities that use, divert, obstruct, or change the natural flow or bed of any waters of the state. The purpose of the requirements, which are administered through the HPA permit process, is to protect fish habitat in stream channels, to prevent erosion, and to protect freshwater and nearshore marine aquatic life. Any construction activity such as bridge painting, channel improvements, stream restoration, or culvert replacements within the ordinary high water mark of any stream would fall under the HPA permit requirements.

On March 28 2014, the Governor approved Senate House Bill (SHB) 2251 that requires all fish barrier removal projects sponsored by local governments to use a streamlined HPA permit review process in Revised Code of Washington (RCW) 77.55.181. The bill also establishes a fish barrier removal board to coordinate efforts to identify and prioritize fish barrier removals.

3.6 Floodplain Management RCW 86.16

Chapter 86.16 RCW Floodplain Management establishes statewide authority Ecology for the floodplain management regulation elements of the National Flood Insurance Program (NFIP). Under Chapter 173-158 WAC, local governments must adopt and administer regulatory programs compliant with the minimum standards of the NFIP. Ecology provides technical assistance to local governments for both identifying the location of the 100-year (base) floodplain and in administering their floodplain management ordinances.

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. The City currently does not participate in the Community Rating System (CRS) as the City's only FEMA mapped floodplains are located in a very small area of the Puget Sound coastline of the City.

3.7 Other Related Regulations and Drivers

3.7.1 Shoreline Management Act

The Washington State Shoreline Management Act (SMA) of 1972 (RCW 90.58), as implemented through WAC 173-26, requires all counties and municipalities located along the shorelines of Washington or with waters of statewide significance to develop Shoreline Master Programs (SMPs). The legislation required certain counties and their municipalities to update their SMPs as set forth in SSB 6012, with additional updates to be conducted every seven years thereafter.

The City's Shoreline Management Program was updated in 2011 with the adoption of City of Mukilteo Ordinance 1295. Many of the goals and policies identified in the plan relate to surface water management and support the protection of water quality. In addition to updating the SMP, the Ordinance:

- Created a new MMC Title 17B - Waterfront Development and Shoreline Management Regulations;
- Amended certain sections of MMC Title 17 - Zoning; and
- Repealed MMC 16.28 - First Class Tidelands and Shorelands and MMC 16.28 - Shoreline Management.

3.7.2 Puget Sound Partnership

The Puget Sound Partnership is a state agency created by the Washington State Legislature in 2007. The Partnership works collaboratively with all levels of

government, tribes, businesses and citizen groups to lead and coordinate efforts to restore Puget Sound.

The Puget Sound Partnership:

- Has a firm deadline for its efforts—recovery of the Sound by 2020.
- Has lead responsibility for salmon recovery in the Puget Sound basin and the duty to ensure a sufficient water supply for people and wildlife.
- Has authority to establish and update an Action Agenda with actions and benchmarks needed for all levels of government and watershed groups.
- Is required to oversee the work toward these priorities, with tools and the responsibility to hold entities accountable.
- Geographic scope includes the entire Puget Sound basin.
- Has the responsibility to collaborate with local watershed groups and work within the existing watershed framework.
- Must use independent science advice and expertise in its work.

The Partnership created a long-term plan called the Action Agenda. The Action Agenda, first developed in 2008, explains what a healthy Puget Sound is, describes the current state of Puget Sound, prioritizes cleanup and improvement efforts, and highlights opportunities for federal, state, local, tribal and private resources to invest and coordinate. By statute, the near-term strategies and actions described in the Action Agenda must be updated every two years.

3.7.3 Climate Change & Sea Level Rise

Based on the findings of ongoing studies of current trends in climate change, winter rain events are becoming more severe, and summers are tending toward more drought. Increases in winter precipitation would likely have an effect on localized flooding frequency and also result in an increase of stream flows and susceptibility to erosion in natural water courses. Summer droughts will result in dry stream beds, unless groundwater sources are recharged (UW Climate Group).

Coastal zones are particularly vulnerable to changing conditions. Coastal hazards are associated with higher sea levels during El Nino winter and spring events, more precipitation, and increased southwesterly storms. Impacts include bluff erosion, shifting beach berms and flooding of coastal areas. Modeling efforts have shown that climate-induced drivers of changes in coastal water quality are also expected.

Key concerns with sea level rise include land loss and increased flooding of coastal areas. Most of the western Mukilteo shoreline is bordered by the BNSF railroad tracks and steep hillside bluffs. These bluffs are at increased risk for erosion and landslides due to climate change. Portions of the northern Mukilteo shoreline, particularly at and around Lighthouse Park lie at a relatively low sea level and climate change is predicted to increase the likelihood of flooding and could have an effect on property in those areas.

3.7.4 Growth Management Act

The State of Washington mandates that the City must periodically review and, if needed, revise its comprehensive plan and development regulations - every eight years - to ensure that they comply with the GMA, as per the schedule provided in RCW 36.70A.130. Cities planning under RCW 36.70A.040 must complete such a periodic update for their entire comprehensive plan and development regulations.

The City's most recent *The City of Mukilteo Comprehensive Plan 2035 (Comprehensive Plan)* update is expected to be adopted in August 2015. Due to the fact that there are only a few remaining undeveloped parcels in the City, the focus of the *Comprehensive Plan* has shifted from managing rapid growth towards sustaining and enhancing the City as it currently exists. The *Comprehensive Plan* sets the goals and policies to ensure that Mukilteo remains safe, vibrant, and sustainable for the next twenty years. Surface Water Utility Policy Priorities are identified in the *Comprehensive Plan*.

3.7.5 Critical Areas

Critical areas include: (a) wetlands, (b) areas with a critical recharging effect on aquifers used for potable water, (c) fish and wildlife habitat conservation areas, (d) frequently flooded areas, and (e) geologically hazardous areas. These critical areas are often

explicitly linked to the built and natural surface water and stormwater system. The City's wetlands, streams, and open spaces provide beneficial surface water functions, and stormwater regulations are designed to protect these important functions.

Some of the City's most problematic areas from a surface water and stormwater operation and maintenance standpoint are located in or adjacent to geologically hazardous areas, such as steep slopes. These areas are prone to erosion and landslides, especially when the earth becomes saturated from prolonged or heavy rain events.

3.7.6 City Land Use Codes and Requirements

Land use activities conducted in Mukilteo directly affect surface water and stormwater management through the creation of impervious surfaces and pollution-generating activities. The City's development code is designed to ensure that development is carried out in locations using methods that are safe, do not negatively impact public resources, and fit within the City goals and visions. Chapters 13.12 and 13.16 of the Mukilteo Municipal Code (MMC) outline the Surface Water Management, Storm Drainage Design Standards and Storm Drainage System code elements. The City has adopted the most recent version of Ecology's *Stormwater Management Manual for Western Washington* (SWMMWW) as the standard for storm water development requirements. The City of Mukilteo follows standard plans in the City's Development Standards.

The City's codes and development standards are required to be reviewed, under Section 5.4.f of the NPDES Permit. The City has begun its review of the code and anticipates adoption of any code modifications as they pertain to LID by the required date of December 31, 2016.

Chapter 4: Achievements since the 2001 Plan

In 2001, the Utility was required to adopt *basic* and *comprehensive* stormwater programs under the 1987 Puget Sound Water Quality Management Plan (the PSWQ Management Plan). The PSWQ Management Plan directed the Department of Ecology to develop minimum standards for controlling stormwater discharges. Even though the regulatory mechanism has changed through the adoption of an NPDES Permit process, many of the general categories of requirements have remained the same.

The *basic* program outlined areas of prevention, stressing source control as a first priority. The *comprehensive* programs added inspections, enforcement, and adequate funding, among other program elements. The 2001 Plan analyzed the Utility's programs at the time and compared them to the basic and comprehensive programs that were required. In the 2001 analysis, the City had met some of Ecology's requirements through its Drainage Management Code (Chapter 13.12 of MMC), but it was noted that many elements were deficient.

Since the 2001 Plan, many requirements have evolved, and the Surface Water Management code has been revised several times. Because of this, no comparison of accomplishments to rectify the deficiencies is made here. Since 2001, many Program accomplishments were made, maintenance goals were met, and capital improvement projects were completed.

4.1 Staffing

The Utility hired its first Surface Water Technician in 2013 to help meet the 2007-2013 NPDES Permit requirements and assist with development review for stormwater. In 2015, a full time Senior Administrator was hired in Public Works; 0.5 FTE is allocated to Surface Water. Additionally, since 2001, the Surface Water Utility began supporting a 0.25 FTE GIS / CAD Technician.

4.2 Surface Water Program Achievements

The City has accomplished a number of noteworthy advances in surface water management since 2001.

Accomplishments are categorized under:

- Stormwater Management Program Plan
- Coordination among NPDES Permittees and Other Agencies
- Public Education and Outreach
- Public Involvement and Participation
- Water Quality Hotline Calls and Illicit Discharge Detection and Elimination
- Stormwater Regulation Updates and Development Review
- Municipal Operations and Maintenance

4.2.1 Annual Stormwater Management Program Plan

An Annual SWMP Plan is developed, per NPDES Permit requirements. The Annual SWMP Plan outlines a set of actions and activities which the City intends to accomplish within the year to meet NPDES Permit requirements. Each year, a draft of the Annual SWMP Plan is posted on the City's website and is available for public comment for at least 60 days. After public comment and Ecology submittal, the final SWMP Plan is posted at <http://www.ci.mukilteo.wa.us/Page.asp?NavID=292>. The SWMP Plan addresses the requirements of each NPDES Permit component (see Section 3.1).

4.2.2 Coordination with NPDES Permittees and Other Agencies

Permit coordination with other NPDES Permittees is essential to surface water management. Through sharing of ideas and combining resources, the Utility is able to leverage regional efforts and provide input to future Permit requirements. The City actively participates on the NPDES Permit Coordinators Group, NPDES North Sound Coordinators Group, Stormwater Outreach for Regional Municipalities (STORM), Snohomish County Stormwater Outreach for Regional Municipalities (SnoSTORM)

Group, and the Stormwater Working Group Caucus. The intent of these groups is to share resources, lessons-learned, and coordination efforts on a regional basis.

In addition, the City is part of the Landslide Working Group which is a partnership between BNSF, WSDOT, Sound Transit, and the Cities of Everett and Edmonds. This facilitates the combination of resources. Resource sharing for steep slope stabilization projects benefits the railway operators and the Utility. Additionally, because many of the steep bluffs are directly managed by private landowners, the education of homeowners on private stormwater system maintenance and BMP's is beneficial to all of the entities. Recently, there has been a sharing of outreach materials and resources directed at private bluff property owners.

The City has an excellent working relationship with the Mukilteo Water and Wastewater District which has enabled us to complete joint capital projects, as well utilize their vector truck for investigation and emergency situations.

4.2.3 Public Education and Outreach

The 2001 Plan identified the need for a more active Public Education program. The Utility has made great strides in this area; often by partnering with other regional programs. The Utility uses behavior change strategies and educational opportunities to complete its education and outreach programs.

Behavior Change

Scoop the Poop: In 2007, the City began public education and outreach surrounding pet waste management and disposal. The City posted "Scoop and Bag" signs in public access areas around the City, and installed "Mutt Mitt" pet waste stations at City parks. The City partnered with Snohomish County in a regional program to provide "scoop your poop" materials to the public. Staff provided materials to local veterinarians for their clients, and offered materials at the opening of the City's off-leash park adjacent to Japanese Gulch. In addition, the City passes out doggie bags and bone carriers at City events and has them available during the summer at the front counter at City Hall.

Natural Yard Care: In 2013, the City partnered with Snohomish County and neighboring municipalities to apply for the FY2013 Municipal Stormwater Grants of Regional or Statewide Significance (GROSS) grant funding. The grant was awarded, and is being managed through Snohomish County and an Interlocal Agency Agreement with all of the participating municipalities. The grant's goal is to measure residents' understanding and adoption of natural yard care techniques by comparing and evaluating two stormwater management outreach and education approaches specific to natural yard care practices targeting homeowners. North Puget Sound partner communities will conduct lecture series, while South Puget Sound partners will host small group workshops. The partnership allows for sub-regional evaluation, fielding, and refinement to administer an effective program for natural yard care practices.

In 2013, the City entered into an Interlocal Agency Agreement with the Snohomish Conservation District to provide public outreach activities using natural yard care practices and low impact development techniques. This partnership continued into 2015 with the addition of educational outreach to teachers and students through the use of the Snohomish County's Water Lessons in 2014.

Public Awareness

Puget Sound Starts Here: In 2009 the Puget Sound Starts Here (PSSH) public awareness campaign began as a result of STORM and the Puget Sound Partnership through funding from the Washington State Department of Ecology and the Puget Sound Partnership's Action Agenda for the recovery of Puget Sound. The City is part of this collaborative effort of over 750 organizations, which include federal, state and local governments, tribes and non-governmental organizations dedicated to protecting Puget Sound. The goal of the PSSH is to raise awareness of how everyday actions impact the Puget Sound and demonstrate how each individual has a vital role in the regional goal of improving the health of Puget Sound.

Telephone Survey: The City conducted a telephone survey in 2010 to measure the public's knowledge and practices regarding stormwater in Mukilteo. The goal of this

survey was to understand the public's comprehension of stormwater and determine which areas could use more public outreach to educate the public on stormwater issues. Results of this survey indicated that Priority 1 issues for public outreach should be focused on how individual actions affect water quality.

Beach Watchers: In 2015, the City connected with the Snohomish County Beach Watchers to integrate stormwater messaging into its existing program, conducted at Lighthouse Park. The Beach Watchers already provided outreach and education services for City residents primarily around the marine environment. They now incorporate a stronger stormwater message into the program.

Newsletter: The City has a quarterly newsletter which has been used to get the word out about the practices that benefit stormwater.

Public Involvement and Participation

The City encourages involvement in surface water issues. The City established a Citizen Advisory Committee made up of 7 residents who were actively involved in the development of this Plan. As part of this plan, a citizen survey was sent out to all City residents to inquire about their stormwater issues and ideas, and several open houses were held to gather additional input.

Each year the City solicits public input on the Annual SWMP Plan prior to finalizing the SWMP Plan.

4.2.4 Technical Assistance

Water Quality Hotline Calls / Illicit Discharge Detection and Elimination

In 2009, the City Council adopted Ordinance 1222 which included Title 13.12.080 *Discharge of polluting matter – Illicit Connections – prohibited* and Title 13.12.310 *Enforcement*. With these regulations in place, and as required by the NPDES Permit, the City set up an Illicit Discharge Detection and Elimination (IDDE) hotline for the public to report suspected illicit discharge activities. In 2009, we received one hotline

IDDE related call and it has increased only slightly to three in 2014. Staff followed up on each of these calls. Often the only response required is outreach to the spiller. However, in some cases, clean-up of the spill is required.

Drainage / Flooding Service Requests

The City has provided technical assistance to private property owners, Homeowner's Associations, and businesses to help solve stormwater and surface water issues. The number of service requests has only begun to be tracked, during dry months in 2015. In that time period, the City responded to an average of 5 drainage complaints per month. This is presumed to be a low estimate since it encompassed some of the driest months on record.

4.2.5 Engineering - Stormwater Regulation Updates and Development Review

The City's Development Standards were updated in July 2009 by Resolution 2009-15. In addition, the MMC Chapter 13.12 *Drainage Management* was repealed in its entirety and MMC 13.12 *Surface Water Management* was adopted and MMC 17.08.020 *Definitions* was amended through Ordinance 1222.

In 2001, the Utility had no way to track its plan review and development inspection program. The Utility now uses a database (SmartGov) to track both of these. The Engineering Development staff reviewed 78 site plans in 2014, and performed 97 inspections during construction. In 2013, 55 site plans were reviewed and 79 inspections were done during construction. From 2009 to 2012, staff reviewed 35 site plans, and performed 89 inspections during construction. One reason for the increasing number of reviews since 2009 is the economic recovery from the 2008-10 recession.

Another driver of increased staff time is that the required reviews have increased. Under the Development Standards, the MMC Amendments, and the *2012 Stormwater Management Manual for Western Washington* (SWMMWW), smaller projects require stormwater review and stormwater project designs have become more complex (see Chapter 6 for further discussion). This has translated to an increase in the number of

hours spent on review per site plan as well as an increase in the number of site plans reviewed.

4.2.6 Municipal Operations and Maintenance

The Stormwater Operations Division of Public Works cleans and maintains the stormwater infrastructure. One of the deficiencies noted in the 2001 Plan was a lack of documentation for maintenance activities. Because of the lack of documentation, data is only available since 2007. The division has conducted the following activities since 2007:

- Cleaned and inspected 6,381 catch basins;
- Maintained 36 detention ponds, including vegetation management and sediment removal;
- Inspected 73 structural BMPs, including ponds and vaults

In addition, the division has constructed small localized improvements to the City's drainage system.

4.2.7 Stormwater Infrastructure - GIS Database

With assistance from a Consultant, the City created a geodatabase of the stormwater assets in the City and the surrounding growth area. The City followed up with a geodatabase of the known outfalls located in the City. The information in the database has never been field verified, and is being continually updated. The City posts a Stormwater Atlas on the City's website, making maps of the public stormwater infrastructure available to the public. This is often useful to developers as a starting point for designing their stormwater project.

Benefits of the database to the City include collection and storage of key attributes for each asset in the system. The mapped network can help City staff trace suspected illicit discharges. Finally, the City can use the geodatabase to model stormwater and understand the hydrologic impact of management decisions. For example, the geodatabase was used in modeling the Capital Projects for this Plan Update.

4.2.8 Stormwater Pollution Prevention Plan (Public Works Shop)

In 2011, the City developed a Stormwater Pollution Prevention Plan (SWPPP) for the Public Works Shop. The objectives of the SWPPP are to:

- Identify locations of all materials that could cause pollution if spilled or otherwise released into the environment;
- Identify all storm conveyances, treatment facilities, and discharge points to aid in the isolation of contaminants should any be spilled into the system;
- Identify locations of spill containment equipment and materials;
- Implement and maintain best management practices (BMPs) that identify, reduce, eliminate, and/or prevent the discharge of stormwater pollutants;
- Prevent violations of State surface water quality, groundwater quality, and sediment management standards;
- Eliminate unpermitted discharges and other illicit discharges to storm drainage systems;
- Provide information to staff on BMPs for the Public Works Facility.

4.2.9 Capital Projects Completed

The 2001 Plan identified 74 problem areas, and ranked nine of the “Top-priority Citywide Problems,” shown in Table 4-1. This table has been updated to reflect the current status of the previously identified high-priority projects. In some cases, the problem areas were not mapped or documented with exact locations. With the change in personnel, it is unknown whether the project was completed. These are noted as “unknown.” Projects identified as “not completed” since 2001 were rolled into the Capital Project analysis for this Plan Update. Conversely, the City has completed several capital projects that were not on the original high-priority list.

TABLE 4-1: 2001 RANKING OF TOP-PRIORITY CITYWIDE PROBLEMS

2001 Problem ID	Description from 2001 Plan	Current Status
M1	At 126th Street SW cul-de-sac, in ravine below, there is erosion from outfall. Water from outfall flows along road into creek. Road is eroding causing siltation in creek.	Development project resolved the problem.
E1	At 53rd Avenue W, north end of street past 80th Street SW, the area floods due to lack of drainage.	Not addressed
M4	West of Cyrus Way, upper end of creek, there is vehicular traffic across creek bed.	Unknown
CB11	At intersection of First Street and the Mukilteo Speedway, storm water flow off ferry holding area in front of Ivar's is a problem. Stormwater flows east down the middle of road to Park Ave. No water quality control or oil/water separator. Type 2 on First St. inadequate capacity, which all connects to State Park next to bulkhead on First St. Floods street and parking on First St. up to Buzz Inn.	Addressed through Ivar's remodel and other development projects
CB10	No tide gate on the Park Street outfall. Water depth of 1.5 feet at high tide and runoff. Water backs up to First Street during high tide events (only).	Currently on Tier 2 list for 2015
I19	Pipe collapsing or groundwater transporting the pipe bedding material. Creating pond on 59th Ave. W.	Maintenance of local detention pond solved this issue
D13	There is no outfall on the system. It dead-ends at the Bell property.	Completed in 2001 as part of Horizon Heights
G11	Inadequate capacity due to open ditch, shallow pipe, steep grade, and small pipes.	Not addressed
H12	Sheet flow over all properties west of 63rd Place W.	Completed 2004

Completed projects are described below in table format, for the following categories:

- Flood Reduction Projects
- Emergency Projects
- Water Quality Improvement Projects
- Habitat Improvement Projects
- Other Projects

TABLE 4-2: FLOOD REDUCTION PROJECTS SINCE 2001

YEAR	PROJECT TITLE	PURPOSE / DESCRIPTION
2001	Horizon Heights Outfall	Install detention pipe, storm drain pipe and outfall at the northernmost portion of East and West Horizon Drive, conveying down the adjacent steep slope.
2001	2 nd Street / Prospect Ave to 3 rd St / Cornelia Ave	Install storm drainage on Cornelia Avenue and Prospect Avenue from the alley south of 3 rd Street to the existing storm drainage facilities on 2 nd Street.
2002	Olympic View	Install new control structure and redirected flow to new pipe system on Clover. Extended curb on Mukilteo Speedway from Clover Lane to Horizon Heights. Inlet pipe upsized on 19 th Court to reduce flooding.
2002	64 th Place W	Install infrastructure to collect stormwater from 64 th Pl W and surrounding residences; conveyed to facilities on Marine View Drive.
2002	89 th Place SW	Enclosed open ditch and upgraded existing system to match the downstream system on 89 th Place SW. Installed a new control structure and improved access to a detention pond on 46 th Place W.
2004	63rd Pl West	Enclosed existing drainage ditches along 63rd Place West; conveyed it to the bottom of the adjacent steep slope and Big Gulch Creek through an energy dissipater. Extruded curb installed to direct roadway surface water to catch basins.
2004	19th Drive	Enclosed drainage ditches along the north side of 19th Dr. Installed extruded curb.
2004	46 th Place W	Installed storm drain lines and a slight swale along the back of properties abutting 46 th Place W.
2005	2393 MSW	Replaced and extended an existing outfall pipe, and installed an energy dissipater at the outlet at 2393 Mukilteo Speedway.

2005	91 st Pl SW	Intercepted the storm drainage pipe under 91st Place SW. Conveyed it along the roadway to the existing outlet point for the 'decorative' ponds. Installed energy dissipater at the outlet of the system to minimize erosion.
2005	Webster Way, 63 rd Pl W / 64 th Pl W	Installed piping and a stormwater outfall to convey stormwater off of Webster Way, 63rd Place West, and 64th Place West to the bottom of the adjacent steep slope and Big Gulch Creek.
2006	Misc. Pipe installation	Installed stormwater pipe and new pavement on 45th Place, 48th Avenue W., and 49th Avenue W to better capture runoff. Routed it to the City's 76th Street storm system.
2006	Bayview Pond Pipe	Installed new storm drainage pipe to provide better runoff conveyance to the Bayview Detention pond, and to help alleviate erosion in the existing ravine.
2006	Pine Crest Detention Pond	Expand and retrofit the Pine Crest North detention pond (1000 Block of Hill Street) to increase the storage capacity and reduce downstream flooding.
	92nd Street Park Drainage Improvements	Installed drainage to capture the water and direct it to the existing storm drainage system, reducing local flooding problem.

FIGURE 4-1: FLOOD REDUCTION PROJECT - PINE CREST DETENTION POND



TABLE 4-3: EMERGENCY PROJECTS SINCE 2001

YEAR	PROJECT TITLE	PURPOSE / DESCRIPTION
2007	Big Gulch Emergency Sewer Line Repair Project	200 feet of exposed sewer pipe was damaged during a November storm and posed an imminent threat to Big Gulch. The Mukilteo Water and Wastewater District reconstructed the sewer line and enhanced Big Gulch Creek through the addition of appropriate embankment materials, hydraulic controls, woody debris, and riparian vegetation.
	Mukilteo Lane Slide Repair	Installed a soldier pile wall to correct a road base failure; fill behind the wall; and repave the road. Installed curbing and storm drainage conveyance facilities.
	63rd Street Slide Repair	A slide off the end of 63rd Street SW above the Mukilteo Water and Wastewater District's Wastewater Treatment Plan put the City's storm drain line and the District's sewer line at risk. The District and the City entered into an ILA and shared in the cost of the project. Added an additional storm drain line and swale to catch water prior to the slide area.

2013	Edgewater Outfall	Installed catch basins, above ground HDPE piping, and an outfall with energy dissipation at Edgewater Creek. Emergency declared by Council in October of 2013 for the slide repairs at Mukilteo Boulevard and Edgewater Creek.
2013	Wastewater Treatment Plant Road Drainage Improvements	On August 29, 2013, a large storm event caused the road to the Wastewater Treatment Plant to wash out. Installed new piping, catch basins and a culvert under the road into Big Gulch Creek; changing the drainage route to prevent future occurrences.
	92nd Street Slide	The project installed a soldier pile wall to prevent failure of the roadway in the 6100 block of 92nd Street. Enclosed an open ditch and installation of an interceptor pipe.
2015	Harbour Heights Parkway	The 36" stormwater pipe was impacted by a small slide within the ravine. The project stabilized the pipe throughout the entire section of the ravine.

FIGURE 4-2: EMERGENCY PROJECTS

**Big Gulch High Flow Pipe
Treatment Plant Road Drainage**



TABLE 4-4: WATER QUALITY IMPROVEMENT PROJECTS SINCE 2001

YEAR	PROJECT TITLE	PURPOSE / DESCRIPTION
2012	Watershed-Based Stormwater <i>Strategies Plan</i>	Developed the <i>Strategies Plan</i> Outreach effort to help combat increased erosion in gulches, degradation of habitat and deterioration of the health of Puget Sound related to high stormwater flows.
	Lighthouse Park Phase II	Constructed LID features to treat stormwater from Lighthouse Park, as part of the Park Improvement project.

2012	Mukilteo Estates Pond Retrofit (Smugglers Gulch LID Projects)	Graded pond to increase capacity. Water quality enhancement made. Funded by Ecology to retrofit pond and construct LID projects within the Smuggler's Gulch drainage basin (the Smugglers Gulch Grant).
2015	50th Place Pond Retrofit (Smugglers Gulch LID Projects)	Retrofit an existing stormwater pond located in the 9000 block of 50th Place W. Redirected streamflow around the detention pond and increased the capacity of the pond, improving flow control and enhancing water quality. Two of 4 constructed with the Smugglers Gulch Grant.
2015	44th Ave W. and 49th Ave W. Bioretention Swales (Smugglers Gulch LID Projects)	Retrofit existing ditches with bioretention swales, increasing the capacity and providing water quality treatment. Third and 4th of four projects with the Smugglers Gulch Grant. Design phase paid with 2013 Stormwater Capacity Grant from Ecology.
2013	Olympic View Middle School Bioretention Swales (Design only)	Designed bioretention swale to be located on the west side of the property, between the drive lane and the development to the west through the 2013 Stormwater Capacity Grant from Ecology.
2013	56th Ave. W. Bioretention Swales (Design Only)	Designed bioretention swale to be located on the 56th Avenue West within the existing shoulder on the west side just south of the intersection with 92nd Street SW.

FIGURE 4-3: WATER QUALITY IMPROVEMENT PROJECTS

**Lighthouse Park Phase II
Mukilteo Estates Pond
50th Place Pond Retrofit**



TABLE 4-5: HABITAT IMPROVEMENT PROJECTS SINCE 2001

YEAR	PROJECT TITLE	PURPOSE / DESCRIPTION
2009	Japanese Gulch Fish Passage – Phase I: Box Culvert Improvements	In 2009, the City, Snohomish County Airport, and WDFW partnered to remove fish passage barriers in Japanese Gulch. Phase I added a combination of baffles and boulder placements to concentrate and deepen the flow of water through the existing box culvert.
	Japanese Gulch Fish Passage – Phase II: Fish Ladder	Phase II of the project was located at a perched culvert approximately 260 feet upstream of the railroad crossing. Installed a fish ladder to provide access to the perched culvert under the Boeing Railroad spur. Placed baffles in the culvert to make fish-passable.
2011	Japanese Gulch Fish Passage – Phase III : Stream Relocation/Reconstruction	Phase III of the project realigned the stream south of the Boeing Railroad spur. Moved the creek from the engineered channel to the historical, included placing cobble substrate and Large Woody Debris (LWD) for fish habitat.
2010	Japanese Gulch Fish Passage – Phase IV: Fish Passage Weirs to the Pond	Reports of salmon in the creek were made during the fall of 2010. The Tribes requested investigation of the possibility of connecting the Japanese Gulch wetland, just south of Mukilteo Lane, to Japanese Gulch Creek to further improve salmon rearing habitat. The project built a fish ladder out of natural log materials on the upland sides of the outfall.

FIGURE 4-4: JAPANESE GULCH HABITAT IMPROVEMENT PROJECTS



TABLE 4-6: OTHER PROJECTS SINCE 2001

YEAR	PROJECT TITLE	PURPOSE / DESCRIPTION
2015	Bayview Stormwater Pond Fence Replacement	The project replaced an existing fence surround the detention pond. The fence provides safety and security for the facility.
	Fence Replacement 108th St. & 53rd Ave. Pond	The City replaced an existing wooden fence around a .33 acre detention pond.
	Fence Replacement 107th St. & Chennault Beach Pond	The project replaced a rotten fence around a detention pond.
2012	GPS Field Equipment	The City purchased a GPS Trimble Unit and a Tablet Computer which allows staff to collect data in the field and input it into our GIS base map. This equipment has helped track maintenance efforts over the past three years.

FIGURE 4-5: BAYVIEW POND FENCE



Chapter 5: Surface Water Utility Policies and Goals

5.1 Surface Water Utility Policies

The *Comprehensive Plan* lays out seven Goals to Achieve a Livable Mukilteo, and identifies seven Utility Policies, three of which apply to the Surface Water Utility. This Plan Update directly supports several City-wide goals and operationalizes the Policies. Figure 5-1 shows how the Utility has a direct role in supporting the City Goals outlined in the *Comprehensive Plan*.

FIGURE 5-1: HOW UTILITY PROGRAMS SUPPORT CITY GOALS



The Utility Supports a FLOURISHING NATURAL ENVIRONMENT. The Utility strives to ensure the natural environment flourishes and thrives. The Utility works to *protect environmental resources & habitat* through development review and implementing and enforcing local and regional stormwater regulations. The Utility's Stewardship, Outreach and Involvement program provides Mukilteans direct access to information on how they can reduce their negative environmental impacts *through minimizing the*

use of toxic products. Staff training includes procedures on best management practices that *model environmentally-friendly practices.*

The Utility Supports a HEALTHY BUILT ENVIRONMENT. As part of the stormwater operations and maintenance, the Utility proposes to evaluate and maintain existing infrastructure to achieve and *maintain a quality built environment.* This means that new infrastructure is built to appropriate standards, ensuring that our surface waters are managed as a renewable resource.

The Utility Supports a VIBRANT ECONOMY. The Surface Water Utility is funded through stormwater utility fees, paid by residents and businesses. The Utility strives to keep the fees as low as possible, while still meeting the Utility's needs in a fiscally responsible manner. This is achieved through a planning process yielding a *budget that manages long term revenues & expenditures.* The Utility evaluates the resources required to provide stormwater services that benefit the public, plan for the future, and appropriately balance risks with costs. The Utility *supports and promotes innovative industries* through the use of emerging technologies in stormwater.

The Utility Supports AUTHENTIC PARTICIPATION. Public involvement and education is an integral part of stormwater management in Mukilteo. City staff actively solicit public feedback on the direction of the Utility through a *collaborative community planning* process that included Open Houses and a Citizen Advisory Committee. The Utility strives to provide opportunities, both large and small, for public engagement in surface water issues. Many of the defined performance standards and processes recommended in this plan support a *transparent and responsive leadership.*

The Utility Supports a HEALTHY COMMUNITY. A healthy community should have *clean water.* The Utility's goal is to manage surface water and stormwater water so that it doesn't negatively impact the City's aquatic natural resources. The Utility also provides outreach and tools for residents to make behavior changes that can help reduce water pollution. The utility promotes stewardship over water resources.

The Utility Supports INNOVATION: The Utility can set an example of *creative problem solving partnerships*. Examples include working with residents to solve issues to the City's surface waters, considering innovative development proposals, and partnering with neighboring jurisdictions working toward the same goals of sustainability and clean water.

The Surface Water Utility adopts the following Policies found in the *Comprehensive Plan*.

UT1: The location, construction, operation, and maintenance of utilities shall minimize impacts to the natural and human environment by using current best management practices to ensure safety and protection of public health, safety, and welfare.

UT6: Surface water management planning and operations shall comply with City, State, and Federal surface water regulations and be consistent with the City of Mukilteo *Comprehensive Plan*.

UT6a: New and reconstructed stormwater collection, conveyance, and treatment systems and the construction and reconstruction of streets shall comply with all NPDES requirements and City design standards.

UT6b: Periodic updates of the City of Mukilteo Surface Water Management Plan (or its equivalent) shall be undertaken as needed to ensure the stormwater management utility is effective and rates are adequate to finance the operation of the utility.

UT6c: Only stormwater shall be allowed to be discharged into the stormwater system

UT6d: Drainage, flooding, and stormwater run-off impacts shall be minimized to the maximum extent practicable in land use development proposals and City operations.

UT7: Streams and wetlands should be an integral part of the stormwater management system provided they are protected from the negative impacts created by altered flow regimes and pollutant sources.

UT7a: A stormwater management program using best management practices should be implemented for flow control and water quality treatment that protects wetlands and streams from impacts generated by upstream development and should include planning at the watershed basin scale.

UT7b: The preferred development and redevelopment stormwater management alternatives are low impact development strategies and the protection of critical areas, major wetlands and drainage functions.

UT7c: Techniques that protect wetlands and other critical areas which play a positive role in improving water quality and mitigating peak flows should be considered, including but not limited to, delineating their locations, adopting additional land use regulations to protect them, and purchasing of development rights.

5.2 Surface Water Utility Goals

The Surface Water Utility supports the City's goals and policies through operational, technical, and outreach programs that are geared toward stewardship of the Utility and of the City's surface waters. This stewardship is realized through achievement of the Utility's six goals explained below.

5.2.1 Reduce Localized Flooding

Flood reduction involves reducing flood hazard safety risks, flood damage to public and private properties from public drainage, and disruption of critical City services. Contributing factors for flooding can include each of the following, either separately or in conjunction, depending on the event:

- Changing hydrology due to development

- Deferred maintenance of the stormwater infrastructure
- Storm events that exceed the designed capacity of the stormwater infrastructure

The Utility can reduce the risk of flooding through its Operations and Maintenance Program, Engineering Development Services, and Capital Projects by:

- Completing scheduled maintenance on the stormwater infrastructure
- Regulating development and redevelopment projects in a sustainable fashion
- Identifying opportunities for improvements of the stormwater network, and establish a financially sustainable plan for capital projects

5.2.2 Mitigate Stormwater Impacts to Steep Slope Areas

Mitigating stormwater impacts to steep slope areas involves maintaining the stormwater network to its design and maintenance standards, and reducing upstream localized flood hazard safety risks. Contributing factors for stormwater impacts to steep slope areas can include each of the following, either separately or in conjunction, depending on the event:

- Changing hydrology due to development
- Deferred maintenance of the stormwater infrastructure
- Storm events that exceed the designed capacity of the stormwater infrastructure
- Underlying geology and steep slopes

The Utility can reduce the impact of stormwater on steep slopes through its Operations and Maintenance Program, Engineering Development Services, and Capital Projects by:

- Regulating development and redevelopment projects in compliance with State regulations
- Completing scheduled maintenance on the stormwater infrastructure
- Providing technical assistance to property owners on stormwater facility maintenance and stormwater management on steep slopes

- Identifying areas of risk based on underlying geology

5.2.3 Protect and Improve Water Quality

The protection and improvement of water quality is a complex undertaking for the Utility, and requires a multi-pronged approach. To add to the complexity of addressing the problem, the Utility must also be sure to meet regulatory requirements, especially as they relate to protecting Beneficial Uses and its NPDES Phase II Permit. Examples of contributing factors to degrading water quality include cumulative deleterious impact from:

- Unregulated and/or unmonitored industrial practices
- Residential practices such as fertilizer application
- Pet waste left unattended
- Unmaintained stormwater infrastructure (both public and private)
- Illicit spills and dumping down storm drains

The Utility can protect and improve water quality through its Operations and Maintenance Program and Public Outreach by:

- Conducting technical assistance to businesses whose practices may impact stormwater
- Operating a comprehensive outreach program on how individuals can effect change
- Completing scheduled maintenance on Public stormwater facilities
- Ensuring that Private stormwater facilities are maintained
- Operating a comprehensive Illicit Discharge Detection and Elimination Program

5.2.4 Educate Public on Surface Water Issues

Because many of our surface water pollution issues are a direct result of every day actions taken by individuals, it is important to have a robust public outreach program. The outreach program should address a number of specific issues, and should reach the entire community, through different avenues. Efforts should:

- Be socially equitable
- Promote behavior change (not just education)
- Provide positive alternatives to promote behavior change

The Utility's Community Stewardship, Outreach and Involvement Program should have outreach programs focused on:

- Pet waste clean up
- Natural yard care
- Business outreach
- Mobile business outreach
- Others as identified and as partnerships arise

5.2.5 Protect and Enhance Stream and Wetland Functions

The City has many areas with streams, wetlands, and natural habitat that provide value to the City's surface water Utility, water quality, and the City's residents. While there are many regulations related to stream and wetland habitat enhancement, especially where salmon habitat is concerned, the Utility benefits from preservation of native vegetation, natural habitat, and habitat enhancement projects. Efforts should continue to:

- Identify and preserve existing healthy habitat,
- Enforce development standards that mimic natural hydrology and preserve native species and habitats, and
- Provide public education and help coordinate efforts to protect or enhance habitat.

The Utility may support stream and wetland enhancement capital projects where there is a direct linkage to stormwater flooding, water quality, or erosion.

5.2.6 Manage Programs with Long Term Planning

The Utility's Programs should be managed through long term planning processes. Basin analyses can provide long term solutions to identified problems. Asset management can increase infrastructure longevity. Regular inspections and maintenance can assure structural integrity of stormwater facilities to assure the designed flow control and pollution control objectives are being met. Pipe maintenance assures flow is directed into predicted flow paths, reducing flooding. With regular maintenance, the City will require fewer capital improvement projects over the long term. Financial planning assures that the Utility's rates meet the Utility's needs and that the dollars are aligned with Utility goals.

Long term basin planning, financial planning, and asset management of stormwater infrastructure benefit the City by:

- Prolonging the life of the infrastructure,
- Identifying emerging issues prior to failure,
- Reducing the overall cost of improvement projects,
- Providing a financially sustainable rate structure for the Utility, and
- Reducing negative impacts to water quality.

Long term planning efforts should include:

- Routine maintenance programs with defined schedules and standards,
- Watershed basin planning to identify opportunities and barriers to stormwater improvements,
- Asset management program to prioritize asset repairs and define a replacement schedule,

- Annual evaluation of the Utility's Performance Measures, including appropriate adjustments to meet changing needs, and
- Evaluation of the Utility rate structure in 2021.

5.3 Relationship between Utility Goals and Programs

The Utility supports the *Comprehensive Plan* by meeting the Utility's specific goals outlined above. These goals are met through various programs and activities conducted by the Utility. These programs are outlined in Chapters 6 and 7. Chapter 8 then outlines a method to evaluate the Utility's program achievements through Performance Measures. The Utility expects that if it has met the Performance Measures, as laid out in Chapter 8, during the term of this Plan, it will have met the goals above.

There is overlap between the different goals, policies, and programs outlined above, but Table 5-1 below highlights the major points of intersection among them.

TABLE 5-1: RELATIONSHIP BETWEEN CITY GOALS, POLICIES, AND SW UTILITY GOALS

City Goal	City Utility Policy	Utility Goal	Utility Programs
Flourishing Natural Environment	UT1: Minimize impacts to human and natural environment UT6c: Only rain down the drain UT6d: Reduce negative stormwater impacts UT 7: Protect streams and wetlands from negative impacts of surface water	1: Reduce Localized Flooding 2: Mitigate Stormwater Impacts to Steep Slopes 3: Protect and Improve Water Quality	→ Operations and Maintenance → Engineering Development Services → Technical Assistance → Capital Projects → Community Stewardship, Outreach and Involvement → Capital Projects
Healthy Built Environment	UT1: Minimize impacts to human and natural environment UT6a: Stormwater development must meet City and State standards	1: Reduce Localized Flooding 2: Mitigate Stormwater Impacts to Steep Slope	→ Operations and Maintenance → Engineering Development Services → Technical Assistance → Community Stewardship, Outreach and Involvement → Capital Projects
Vibrant Economy	UT6b: Update Comp SW Plan Update and evaluate surface water rates	6: Manage Programs with Long Term Planning	→ Basin Planning → Asset Management
Authentic Participation	UT6c: Reduce negative stormwater impacts	4: Educate Public on Surface Water Issues	→ Community Stewardship, Outreach and Involvement
Healthy Community	UT1: Minimize impacts to human and natural environment	3: Protect and Improve Water Quality	→ Operations and Maintenance → Engineering Development Services → Technical Assistance → Community Stewardship, Outreach and Involvement
Innovation	UT7c: Use all methods available to protect streams and wetlands	1-6: Incorporated into all Goals	→ Incorporated into all Programs

Chapter 6: Level of Service Analyses to Meet Utility Goals

This section includes an evaluation of level of service (LOS) alternatives for the Utility's current programs. For many, but not all, of the programs within the Utility, staff examined two LOS alternatives. The two levels of service are referred to as Level of Service 1 (LOS 1) and Level of Service 2 (LOS 2).

LOS 1 options are defined as meeting the NPDES Permit requirements, or keeping up with basic maintenance. LOS 2 options include meeting NPDES Permit requirements, and include a long range programmatic approach. A financial analysis was run for all LOS options considered. In programs where a higher level of service was needed to bring the current program up to a LOS 1 standard, a LOS 2 option was not considered. This decision was made to reduce the financial impact to the rate payers. Expanding the Utility's program to meet NPDES requirements is mandatory. Any current LOS that did not meet minimum regulatory requirements was not considered a viable option.

6.1 Introduction

The LOS options were weighed against the Utility goals outlined in Chapter 5. Recommendations are made that meet those Goals. This chapter only reviews LOS options for existing programs. Any proposed new programs are included in Chapter 7.

This analysis was conducted based upon the current (2013-2018) NPDES Phase II permit requirements. In 2018, there will be a new NPDES Phase II Permit. It is possible that new permit requirements could vary from this analysis. The Utility should reevaluate the programs impacted by the Permit. If the revised permit requirements significantly differ from the current Permit, the Utility should make appropriate adjustments.

The following sections describe the Utility's existing programs and a LOS analysis for each of the Utility's major programs. The identification of what each LOS included was

developed by Utility staff. The cost implications are evaluated in Chapter 9, Financial Analysis.

The Surface Water Utility manages a suite of programs that reduce flooding, protect and improve water quality, and protect and enhance aquatic streams and the Puget Sound. Meeting these surface water management goals as well as compliance with the NDPES Phase II Permit requires coordination of activities in several City departments. For this report, the collection of current surface water management activities are organized into the following programs, with staffing considerations included at the end of the Chapter:

- Operations and Maintenance
- Engineering Development Services
- Technical Assistance and Code Enforcement
- Community Stewardship, Outreach & Involvement
- Monitoring and Research
- Capital Improvement Program
- Staffing

These programs are carried out largely by the Public Work Department, with assistance from Planning and Community Development and Finance.

6.2 Operations and Maintenance (O&M)

The Public Works Department provides operations and maintenance services to the City's Utility. The operations staff identify needs and respond to citizen drainage concerns. Infrastructure maintenance needs are identified by staff through regular maintenance activities and citizen reports.

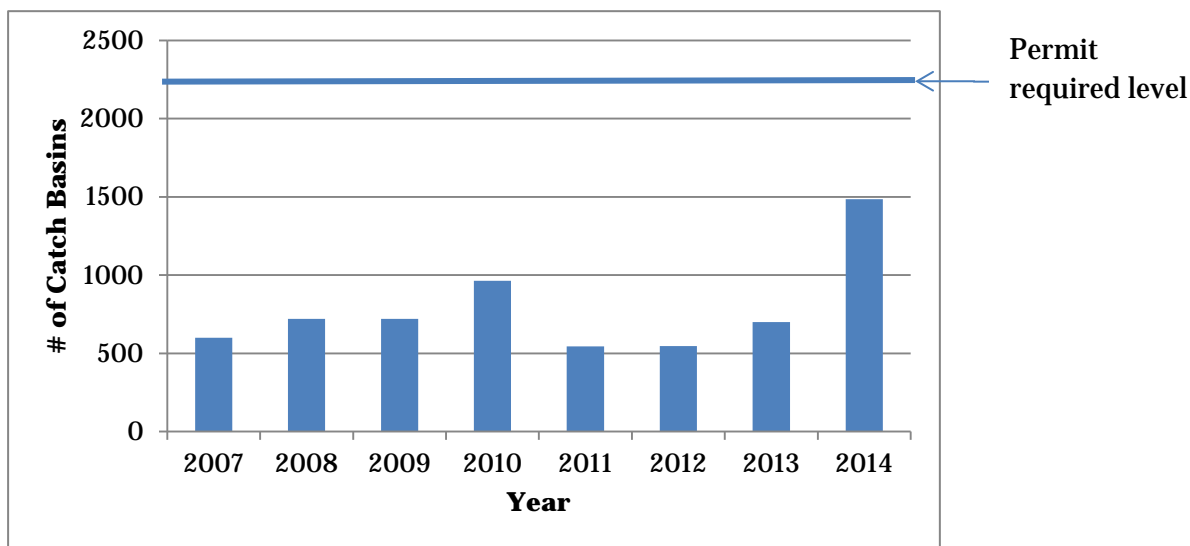
An emphasis on asset management, pipe inspections, and maintenance of the infrastructure is a major change proposed for the Utility. Chapter 7 includes a summary of the benefits of an asset management program and a level of service analysis for this program element.

6.2.1 O&M Existing Program

The existing O&M Program is largely reactive in nature. Maintenance and repairs are handled on a complaint driven basis. Often, a resident will create a Service Request and, upon inspection, it will be determined whether the Utility has the resources to repair or remedy the maintenance issue. Projects are handled on a case-by-case basis and priorities are made based on whether staff has capacity to complete the project combined with how large of an impact the issue has on roads, private property, and other infrastructure. There are no written procedures on when Utility funds are spent on drainage issues and when they are not, leading to an appearance of inconsistency.

Catch Basin Inspections: The City is responsible for approximately 4,700 catch basins. Since record keeping began in 2007, an average of 17% of the City's catch basins have been have inspected (and cleaned) per year (see Figure 6-1). The City rents a vactor truck annually to complete this work. Because of the condensed timeframe of the vactor truck rental, staff are dedicated to only catch basin work during the rental time period. This leads to inflexibility in staff to attend to other items for up to two months per year.

FIGURE 6-1: PUBLIC CATCH BASIN ANNUAL INSPECTION



Publicly Owned or Operated Flow Control/Water Quality Facilities: Some of the City's ponds have had regular vegetation maintenance and a few have had

sediment removal over the past several years to return them to their design function. In 2014, it was recognized that there was outdated and inconsistent documentation of existing Public stormwater flow control and water quality facilities.

In early 2015, the Utility compiled a comprehensive list of public flow control and water quality facilities for annual inspections, including ponds, vaults, and detention tanks (Appendix F). This list may evolve as further investigations are conducted. In the 2001 Plan, there were a total of 69 facilities identified; with only 23 positively identified as belonging to the City. Currently, there are 115 identified publicly owned or maintained facilities; at least doubling the Utility's responsibility for maintenance and repairs.

Ditch Maintenance: From 2001 to 2014, ditch maintenance was not a high priority for the Utility. In 2014, the Utility changed direction and removed excess sediment from many of the City's ditches that had reduced capacity. The goal of the 2014 effort was to address all ditches in need of maintenance. It is anticipated that no major maintenance will be required over the next two years. Scheduled inspections to determine maintenance needs are not completed at this time.

Street Sweeping: In 2008, the City purchased a street sweeper. In 2011, a sweeping plan was drafted for the City, which outlines sweeping frequencies based on road type. In 2014, the street sweeper operated 502 hours and cleaned 2,554 lane miles of roads in Mukilteo. No records were kept prior to 2014, but it is estimated that 2014 was approximately a 25% increase over past sweeping efforts.

GIS Stormwater Inventory – Field Operations: The City first mapped its stormwater infrastructure in GIS in 2011. The O&M Program began using mobile GIS devices to track catch basin inspection and cleaning efforts in 2013. With the infrastructure mapped in GIS, field staff have the ability to make on-the-spot map changes as part of a regular inspection routine. This allows for easy reporting on annual maintenance efforts (an NPDES Permit requirement).

6.2.2 O&M Program Level of Service Alternatives

The current level of service does not meet the metric for LOS1. Because the Utility was striving to keep costs low, only one level of service alternative was considered for O&M. LOS 1 includes augmenting the current program outlined above to be NPDES compliant. Table 6-1 summarizes the elements of LOS 1.

Catch Basin Inspections: The LOS 1 program increases the catch basin inspection and maintenance program to be consistent with the NPDES requirement of 50% per year (currently 17% per year). It considers maintaining consistent documentation of work done. Tracking of sediment loading should be implemented to further refine an inspection and maintenance program. Tracking helps understand where source control measures may be a more effective tool than sediment removal. Tracking also helps identify how resources can be best allocated to areas with higher sediment loading rates. This is an increased level of effort and will require additional staffing.

Public Stormwater Facilities: The LOS 1 program would increase the inspection program of flow control and water quality facilities to an annual program. The NPDES Permit requires that all publically owned facilities be inspected annually; with maintenance deficiencies to be rectified within 6 months of discovery. The intent of the requirement is to identify maintenance issues early to assure that the facilities are functioning as designed.

This inspection approach is beneficial to the utility for three reasons. First, the Utility is able to rectify small maintenance needs at little cost, but with great benefit to water quality or flow control. For example, often flow control structures need minor repair to function properly. Properly functioning structures help protect the downstream receiving water from scouring flows. Secondly, recognizing and repairing minor maintenance needs can prevent larger system failures in the long term. Finally, aging infrastructure or other deficiencies are more likely to be recognized with a consistent inspection program. These larger deficiencies can then become part of a repair and replacement program.

There are several stormwater vaults on SR525 that were installed as part of a WSDOT road project. WSDOT has provided its interpretation of RCW 47.24.020, subsequent clarification provided by the Association of Washington Cities, and WAC 468-18-050. The City should continue to work with WSDOT and come to a final decision on whether it agrees with WSDOT's claim that the City is responsible for inspection and maintenance of these vaults. If the City agrees with this interpretation, this will be an increased level of effort, and require additional staffing, and potentially additional equipment.

Ditch Maintenance: Over time, sediment loading from roads can fill in ditches, decreasing conveyance capacity. Ditch maintenance assures that the design capacity of the conveyance system is operating properly. The City should evaluate the need for a ditch inspection and maintenance program. Based on initial inspections, a rotating schedule of some percentage of the City could be inspected and maintained each year. This is an increased level of effort.

Street Sweeping: While street sweeping provides benefits to street maintenance, and City aesthetics, it is also an important part of stormwater management. By picking up sediment before it enters stormwater infrastructure, it reduces the need for more labor intensive removal with a vactor truck. Sweeping also helps improve water quality. Many pollutants are picked up in road sediment, and the sweeper keeps those pollutants from entering the stormwater system. Sweeping in the fall months removes leaf litter that can plug stormwater inlets, reducing localized flooding. Sweeping can also be a good response tool to an unanticipated spill in the City.

It is recommended to review the current level of service outlined in the 2011 Street Sweeper Plan and determine whether the plan still fits the City's needs. The 2014 efforts exceeded the total hours outlined in the 2011 Sweeping Plan. Staffing levels for the street sweeper function should be adequate to meet any sweeper needs during the next five years.

Pipe Maintenance Program: The City currently does not have a pipe maintenance program. A comprehensive inspection is recommended in Chapter 7. Once this is

complete, the Utility should develop a pipe maintenance program. This will not result in a higher level of service, until the inspections are complete. It is recommended that the initial pipe inspection be conducted via contract because the inspections are an infrequent event, equate to a large enough temporary increase in workload to strip staffing capacity, require specialized training, and expensive specialized equipment, and software programs for analysis.

GIS Field Programs: Continue to support field staff with GIS-based technologies to track and report inspection and maintenance efforts. This will require an analysis of software that has a field component, or of programming the GIS to be field friendly. See Section 6.5 below for more discussion on GIS needs.

Other NPDES Requirements – Trainings: Complete regular trainings for O&M staff on inspection and maintenance of Low Impact Development projects, and BMP implementation for City operations.

TABLE 6-1: O&M - LEVEL OF SERVICE SUMMARY

LOS 1 - Current Program Plus Meet Regulatory Requirements
<p>Current Program: Maintain current O&M program including:</p> <ul style="list-style-type: none"> • Annual city owned catch basin inspection & maintenance (approximately 17% of system per year) • Water quality and flow control facilities: Inspection/maintenance as identified and budget allowed • Ditch maintenance (no programmatic approach) • Street sweeping (per 2011 plan) • Maintain new infrastructure as it is constructed • GIS field applications; used for catch basin maintenance records <p>LOS1 Program Elements:</p> <ul style="list-style-type: none"> • Update maintenance practices/frequencies to meet NPDES requirements (catch basins 50% of system per year; public water quality and flow control facilities annually) • Develop ditch inspection and maintenance program that identifies need and standards for maintenance. • Street sweeping – Analyze level of service outlined in 2011 Sweeper Plan • Adopt infiltration facility inspection and maintenance practices to meet new LID facility requirements (vegetation management, soil replacement) • Develop regular pipe cleaning program resulting from video inspection

program element of Asset Inventory and Management. Implementation of this program should be considered as part of the next financial evaluation of the Utility.

- Provide required trainings to staff for best management practices for clean water in City operations
- Add 2.0 FTE Maintenance Level I

6.2.3 O&M Recommended Level of Service

LOS 1 is recommended for the O&M Program. This option helps achieve the Utility goals of meeting current regulations. It emphasizes preservation of the existing infrastructure while balancing the desire to keep utility rates low by avoiding new costs. Due to the increased level of inspections and maintenance work, it is recommended that 2.0 FTE Maintenance Level I positions be added to stormwater operations.

6.3 Engineering Development Services

The Engineering Development Services programs provide assistance, review, and inspections services to the development community for projects with stormwater components. The level of service options are discussed below and summarized in Table 6-2.

6.3.1 Engineering Development Services Existing Programs

Stormwater Development Standards: Chapter 13.12 Surface Water Management of the City of Mukilteo Municipal Code and the City's Development Standards guide and define stormwater development requirements for the City. In Chapter 13.12.040, the City has adopted the most recent version of Ecology's SWMMWW as the standard to which all development projects need to comply. Because the SWMMWW and the City's Development Standards are not updated concurrently, the City defers to the SWMMWW as the prevailing document. The Development Standards were last updated in August 2012, prior to the release of the 2012 SWMMWW. The 2012 SWMMWW has some significant differences from the 2005 version; therefore there is a gap between the City's Development Standards and the 2012 SWMMWW.

Development Review and Inspections: The City's Surface Water Technician reviews the stormwater components of permit applications. With the Assistant City

Engineer, the Surface Water Technician develops new surface water design regulations and presents them to Council for adoptions. The Engineering Division, in coordination with the Planning and Community Development Division, develops methods, tools, and policies for increasing implementation of Low Impact Development in the City.

Depending on the level of development activity in any given year, surface water staff may review over 75 applications. Due to the fact that Mukilteo is nearly built out, many of the applications are smaller single family residences, commercial tenant improvements, additions and deck permits, engineering or right-of-way permits, or redevelopment projects. On the surface, these may not seem to trigger heavy review. But staff has had increase in workload for permit review for the following reasons:

- The current NPDES Permit requires stormwater review of smaller projects. This increases the number of project types that require review.
- The City's development standards have made low impact development (LID) the preferred alternative. Many project applicants are not familiar with the newer requirements. As a result, projects frequently require several no-charge pre-application meetings and increased review time due to incomplete or inaccurate first submittals.
- The project sites themselves can present development challenges. Many of the available parcels for development left in the City have unique stormwater characteristics and challenges. Often properties have wetlands, geologic hazards, or other constraints that increase review time. The geologic hazards coupled with the new low impact development standards require staff to provide detailed review and comments.

Engineering staff strives to complete review of development permits within four weeks of receiving the files. The typical review takes 6 to 12 hours, and, increasingly, reviews take more time as explained above.

As development projects go to construction, the Surface Water Technician provides inspection services. Typical stormwater inspections include initial temporary erosion and sedimentation control (TESC) inspection and clearing and grading limit inspection. All stormwater infrastructure and connections are also inspected. Many times, additional inspections are required when permit requirements aren't being met.

Recently the City's Building Official and an Assistant Planner in the Planning and Community Development (P&CD) Department completed training to become Certified Erosion and Sediment Control Leads (CESCLs). They now provide assistance to the Engineering division in the required TESC inspections for small projects.

Low Impact Development Code Review and Update: The current NPDES Permit requires the City to evaluate its Code and all development documents to assure that they are not in conflict with the principles of LID. The P&CD Department has taken the lead on this task. It is required to be completed by December 31, 2016. This review will require increased participation by the Surface Water Utility to meet the timeline and Permit requirements, including review by Council.

6.3.2 Engineering Development Services Level of Service Alternatives

The 2012 SWMMWW is 5 volumes thick, and over 1,000 pages. There is a recognized need for the City to provide project applicants with clear guidance sheets on regulations, but currently Engineering lacks the capacity to create these documents. Examples of guidance sheets include: a Stormwater Pollution Prevention Plan template for small projects and guidance on LID requirements. The Utility should also consider a Stormwater Covenant and Grant of Easement template to allow staff to inspect private facilities for proper maintenance, per the NPDES requirement.

It is the recommendation of the Utility to create a separate Stormwater Connection Permit, as allowed in Chapter 13.12.160 of Mukilteo Municipal Code. Currently, the Stormwater Permit is combined with the Engineering Permit. Due to the newer complexities of stormwater review, the Engineering Permit does not adequately cover stormwater requirements and, in some instances, a stormwater permit may be required without a full engineering permit.

Currently, the City has one stormwater review staff (the Surface Water Technician) responsible for review tasks alongside multiple other surface water activities. Development review has strict timelines, and is susceptible to public pressures. This results in review taking precedence over other work, decreasing the level of service elsewhere in stormwater, including NPDES Permit required programs.

The current level of service for Development Services was determined to be LOS 1, meeting Permit requirements. However, there is a need to provide better information to the public. This can be achieved, in part by, providing better templates and guidance documents. Including this service to the public is considered a LOS 2 option.

6.3.3 Engineering Development Services Recommended Program

Increase to a LOS2 program. The Development Services Program is aligned with Section 5.4 of the NPDES Permit. It is recommended that the City's Stormwater Development Standards be updated, and new templates and guidance documents be created.

Because other Utility programs are being sacrificed to meet the level of service for Development Services, there is a staffing need in other areas to meet this LOS2 recommendation. If the additional staff are not hired to alleviate other pressures, then a lower level of service for Development Services should be reconsidered, which may include longer review times. With the overall proposed recommended staffing, the Utility should be able to meet this level of service.

TABLE 6-2: ENGINEERING DEVELOPMENT SERVICES LOS SUMMARY

LOS 2 - Current Program Plus Provide Public with Guidance Documents
<p>Current Program: Maintain current Engineering Development Services Program</p> <ul style="list-style-type: none"> • Provide timely project proposal review • Revise development standards, as necessary • Implement regulations found in the most current SWMMWW • Conduct timely development inspections on erosion control practices to assure compliance with SWPPPs • Conduct timely development inspections on stormwater infrastructure to assure construction is according to plans <p>LOS2 Program Elements:</p> <ul style="list-style-type: none"> • Update Development standards to be consistent with State requirements • Provide guidance documents to project applicants • Create template covenant and access for inspection of permanent stormwater facilities • No additional staffing considered, if other areas are more fully staffed

6.4 Technical Assistance

The existing technical assistance and code enforcement program led by the Utility has seven areas of service; NPDES Permit coordination, staff training programs, GIS stormwater inventory, private stormwater facility inspections, IDDE, assistance with drainage issues/service requests, and code enforcement. The level of service options are described below and summarized in Table 6-3 below.

6.4.1 Technical Assistance Existing Programs

NPDES Permit Coordination: The Utility is responsible to ensure that City programs necessary for regulatory compliance (such as the NPDES Phase II Permit) are understood, and provide guidance when needed, on how to achieve compliance. The Surface Water Utility staff coordinate the City's efforts, and meet regularly with staff from other departments to insure that on-going and planned activities meet Permit requirements. Several areas of the NPDES Permit also require coordination among other jurisdictions. The Surface Water Technician is responsible for this coordination and annual reporting.

Reporting requires tracking results of any program required by the NPDES Permit. Some examples include: all development related inspections, and all O&M programs. Because Engineering is under-resourced, some of this effort has been taken by the P&CD Department over the years. For example, the Low Impact Development Code review is being led by Planning.

Staff training programs: The NPDES Permit requires that the City has a training program for municipal staff. The City does not currently have a training program. The training program covers illicit discharge identification and tracing, Best Management Practices for all City operations, and trainings associated with development review and inspections. Some pieces of the training program have been completed since the 2001 Plan and the Utility will be providing additional trainings in 2015. Due to inadequate staffing, these programs will be completed by a contractor. The Utility has made implementation of a training program a high priority to be completed by first quarter 2016.

GIS Stormwater Inventory: The GIS serves as a database, housing details regarding assets in a spatial and network context. The City contracts out large GIS efforts to map the stormwater network. These efforts have created a good starting place, based on flow models. However, at the site level, the models do not provide enough detail to effectively manage the network. In the past year, some ground truthing of the network has been completed by operations staff during inspections. There is currently no operational method for getting updates from staff into the GIS.

Staff and field personnel consult a static map book to locate assets. This map book is available online to residents and developers; however it is often found that the map book is incorrect. Even if staff record changes in the field, the published map book is not easily updated, even if new information is known.

The GIS is important for the field staff for catch basin inspections. They use a mobile device to conduct inspections, using script that was written within the GIS software by a contractor for that purpose.

Private Stormwater Facility Inspections: The NPDES Permit requires that the City has an inspection program for private stormwater facilities permitted after July 29, 2009. The intent of the program is to assure that the required maintenance is being completed on these private facilities. The Utility is working on developing a program, and anticipates implementation of the program by August 31, 2015. This program would only cover the bare minimum of inspections on private stormwater facilities, and not include any facilities permitted before 2009. Currently, the Surface Water Technician runs the program and will complete the inspections.

Illicit Discharge Detection and Elimination (IDDE): The City has a Spill Hotline and an IDDE program. The Surface Water Technician, with assistance from the Public Works crews, is responsible for following up on any reports of suspected illicit discharge and/or illicit connections. The Utility does not have its own source tracing equipment. Instead, the Utility operates under an Interlocal Agreement with the Mukilteo Water and Wastewater District to provide services in source tracing. Services include laboratory analysis of fecal coliform samples, analysis of other chemical and pH

samples, closed circuit TV inspections of suspected illicit connections, and limited vactoring services in emergency situations. The City is required under the NPDES Permit to inspect 40% of its MS4 for illicit connections and discharge by the end of 2016. This will be accomplished as part of the catch basin inspection program.

Drainage issues / service requests: The Surface Water Technician and the Public Works crew respond to resident drainage issues and concerns. No records are kept to record average response time to service requests. Drainage issues that are the City's responsibility (carry right of way run off or are part of a Public stormwater facility) are maintained by the City. If maintenance deficiencies or minor infrastructure deficiencies of the public system are found to be the source of the problem, then City staff remedies them. Where major infrastructure deficiencies are found, the Utility determines the best course of action. When drainage issues are determined to be private property issues, City staff offers technical assistance and can provide avenues for resources.

Code Enforcement: Code enforcement pertaining to the Utility typically involves improper stormwater management and illicit discharges and illicit connections. Currently, the Utility assists the P&CD Department with Code Enforcement cases by reviewing drainage records, conducting site visits, and providing technical opinions on the drainage issue in question. Escalating measures of enforcement are required for IDDE under the NPDES Permit. Section 13.12.310 Enforcement of the City of Mukilteo Municipal Code states that any violation of Chapter 13.12 is treated as a misdemeanor and is subject to the provisions of Chapter 1.32, General Penalties.

6.4.2 Technical Assistance Level of Service Alternatives

Because a LOS 1 option is an increase over the current level of service, the Utility only considered the basic Level of Service for this Program (LOS 1).

NPDES Permit Coordination: More effort should be put into effectively meeting NPDES Permit requirements and developing programs that can easily track and report the City's efforts towards compliance. While cooperation with other City departments is essential for the City to maintain compliance, the Utility should be fully staffed to lead the effort. Currently, the Surface Water Technician is responsible for this effort. Due to

Engineering Development Services' needs, it is recommended to augment staffing in this area.

Staff Training Programs: Augment the current level of service by adding the required training program that is managed and coordinated through a new position in the Surface Water Utility. This training program should identify all staff who require training under the NPDES Permit, provide training programs for IDDE and Spill response, and document all staff trainings that apply to the program. Each Department should understand their training requirements and seek out appropriate trainings to fulfill these requirements. Trainings should be tracked in a central location.

GIS Inventory: The NPDES Permit requires updated maps of the stormwater infrastructure, including a new requirement to map all known discharge points to waters of the state, including groundwater. The database has the capacity to conduct hydrologic analysis, provide infrastructure information to developers and citizens, and track asset information. The current GIS staffing level does not meet the operational needs of the Utility. The Utility requires additional GIS support for consistent data management and better defined processes for updates.

Future asset management will be heavily reliant upon the GIS as the backbone upon which it will be built. The Utility should update the existing GIS asset inventory to include all private and public stormwater facilities. In addition, the inventory needs to be ground truthed. The Utility should research and develop a recommendation on how to best track maintenance efforts, service requests, and asset condition information. Options include a GIS-centric software or using existing mobile capabilities by writing code within the GIS. By using a GIS-centric application, the information can be meaningful to field staff and help schedule work.

It is recommended to add an additional 0.5 FTE GIS Technician and a 0.25 GIS Coordinator to support the Utility's infrastructure database and program field data collection interface systems.

Private Stormwater facility inspections: The Utility should implement the program that was developed in 2015. Once this program is implemented, the Utility

should explore the possibility of expanding the inspection program to include all private stormwater facilities within the City to provide equitable application of the program, and to help assure better water quality for the City.

Illicit Discharge Detection and Elimination (IDDE): The Utility should augment the current level of service from a reactive to proactive level. One advantage of the proposed pipe inspections is that the City will be better able to identify illicit connections. The Utility should also invest in simple sampling devices to be able to conduct in situ testing for suspected illicit discharges.

Assistance with drainage issues / service requests: The current level of service should be augmented with more clear direction on the Utility’s response to situations where no easement exists on private property for public drainage. This will require review by City Counsel.

Code Enforcement: The Utility should augment its current level of service. The Utility should review its Enforcement Code to determine whether it is administratively the best alternative for enforcing accidental spills. One alternative to consider is a simple fine, to be determined based on the threat posed by the spill.

TABLE 6-3: TECHNICAL ASSISTANCE - LEVEL OF SERVICE SUMMARY

LOS 1 - Current Program Plus Meet Regulatory Requirements
<p>Current Program: Maintain current Technical Assistance program including:</p> <ul style="list-style-type: none"> • Internal and inter-jurisdictional coordination of NPDES Permit requirements • Intermittent staff trainings on Permit requirements • Large-scale contracted mapping of the stormwater infrastructure • IDDE Hotline and spill response • Respond to drainage service requests • Assist in drainage code enforcement cases <p>LOS1 Program Elements:</p> <ul style="list-style-type: none"> • Coordinate better tracking mechanisms for NPDES Permit reporting • Develop staff training program, as required by NPDES Permit • Field verify stormwater network • Provide mechanism to continually update stormwater network, making it available in “real time” to staff and public • Prepare GIS data for “GIS-centric” asset management approach • Conduct private stormwater facility inspections

- Track service request responses
- Provide clear procedure on how service requests are prioritized
- Determine whether current enforcement mechanism is best approach
- Add 1.0 FTE Engineering Staff (Stormwater Programs Coordinator)
- Add 0.5 FTE GIS Technician
- Add 0.25 FTE GIS Coordinator

6.4.3 Technical Assistance Recommended Program Level of Service

Upgrade to a LOS 1 program, which includes the Existing Programs and adds the components discussed under Level of Service Alternatives. Only LOS 1 was considered, but that is an increase in service from the current program. The Technical Assistance Program covers several areas of the NPDES Permit, but also specifically applies to Section 5.3 of the NPDES Permit. This LOS1 option requires 1.75 additional FTE. 1.0 FTE will be required to manage the surface water program elements (including Section 6.5 below) and 0.75 FTE is recommended to manage the GIS needs.

6.5 Community Stewardship, Outreach and Involvement

The Engineering Division provides outreach services regarding stormwater to the residents of Mukilteo. Many of the program elements are a result of partnerships with other agencies. A level of service analysis is discussed below.

6.5.1 Community Stewardship Existing Programs

The current LOS is a LOS 1 alternative.

The Utility has three areas for stewardship and outreach: water quality, drainage issues, and bluff management. Several programs meet NPDES requirements to help residents and business owners understand stormwater pollution as a significant water quality concern. The Utility provides outreach to residents, schools, businesses, and its employees on ways to reduce impacts to our environment. The Utility is involved in education programs both locally and regionally, leveraging other successful outreach campaigns. This method assures continuity of message across the region, and reduces City costs to create programs and materials. The City tailors existing programs to fit the needs of our residents and stormwater needs. Examples of continuing partnerships include: Snohomish County Health Department, Snohomish County, Snohomish

Conservation District, Burlington Northern Santa Fe (BNSF) Railway, Washington Department of Transportation (WSDOT), Sound Transit, and neighboring municipalities. The Utility has outlined Outreach programs to meet Permit requirements for the term of the NPDES Permit, shown in Table 6-4.

Topic	2015	2016	2017	2018
<i>Audience: General Public and Businesses</i>				
Pet Waste Management and Disposal				
Car Washing				
Natural Yard Care				
Youth Stormwater and Water Quality Awareness Education				
Bluff and Vegetation Management				
Low Impact Development Techniques				
Private Stormwater System Maintenance and BMPs				
Prevention of Illicit Discharge				
<i>Audience: Engineers, Contractors, Developers, and Land Use Planners</i>				
Low Impact Development Techniques				
Stormwater Treatment and Flow Control BMPs				
Technical Standards for Stormwater Site and Erosion Control Plans				

Key:

Research and Development

Implementation

Adaptive Management

6.5.2 Community Stewardship Level of Service Alternatives

A LOS 2 alternative would include development of a technical assistance and/or incentive program for existing properties to retrofit their stormwater to provide higher water quality or flow control treatment. Options could include a rain garden program for homeowners or businesses. This need was identified due to Mukilteo's unique geology. Because steep slopes and existing geology can present risks caused by misplaced infiltration facilities, the Utility should provide guidance to those wishing to retrofit their properties with infiltration facilities (rain gardens, for example).

The NPDES Permit requires that education be provided to a specific group. Additionally, Phase 1 Permittees were required in the last permit cycle to include a Local Source Control / Business Outreach program. The combination of this program with a

proactive IDDE program has proven to lead to successful source tracing in other jurisdictions. It is sometimes the case that if Phase 1 jurisdictions have program success, the subsequent Phase II NPDES permit will require similar programs. The LOS 2 alternative includes a technical assistance program for small quantity waste generators in the City.

The Utility should explore partnering with the Department of Ecology's Local Source Control (LSC) Program to assist with funding and structure for this program. Ecology's LSC Program is a partnership where the jurisdiction applies for funding. Staff salary or a contractor can be supported through the funding. The intent of the LSC program is to provide businesses with a site visit and follow up on recommendations for waste management and handling practices that may have an impact on stormwater, as well as other regulatory implications related to waste storage and handling. Often, the technical assistance is as simple as providing a Spill Plan and a Spill Kit.

6.5.3 Community Stewardship Recommended Program

The LOS 2 alternative is recommended by Utility staff. The Utility recommends providing assistance and oversight to infiltration retrofit projects, not covered under the development review process. Additionally, the Local Source Control program has proven to have a positive impact on water quality. The staffing recommendation for Technical Assistance incorporates the additional needs for Outreach under stormwater programs management.

6.6 Monitoring and Research

6.6.1 Monitoring and Research Existing Programs

The current program is a LOS 1. The City does not currently have any programmatic monitoring or research related to stormwater. Under Section S7 of the current NPDES Permit, the City can choose to run its own monitoring programs and studies, or to opt-in to Regional programs in three categories: Status and Trends, Effectiveness, and Source Identification and Diagnostic Monitoring. The City has opted-in to the NPDES

Regional Stormwater Monitoring Program (RSMP). The current rate for the opt-in option is \$13,787 per year for the Permit term.

The City conducts infrequent opportunistic monitoring around stormwater illicit discharge tracing. This is considered under the Technical Assistance section.

Snohomish County conducts Benthic Index of Biotic Integrity (B-IBI) monitoring in Picnic Point Creek, both at the headwaters and at the mouth. Currently, the B-IBI indicates that there is compromised water quality in this watershed. The City of Everett monitors several water quality parameters and B-IBI near the mouth of Japanese Gulch since 2008. These efforts indicate poor to very poor water quality in this watershed.

Currently, several partners are conducting monitoring on steep slopes along the railroad. This monitoring includes rain gage stations and soil monitoring to help better understand slope movement during rain events.

Utility staff are involved in the Stormwater Group Caucus, which helps shape the monitoring requirements under the NPDES Permit.

6.6.2 Monitoring and Research Level of Service Alternatives

No Level of Service Alternatives were considered for this program.

6.6.3 Monitoring and Research Recommended Program

The Current LOS 1 Alternative is recommended by the Utility staff. This level of service allows the Utility to take part in regional efforts and reduce costs to the Utility. During the next Permit Cycle, the City should review this level of service and determine whether the opt-in option is still the best alternative for the Utility, or if these programs should be brought in-house.

6.7 Capital Improvement Program

6.7.1 Capital Program Existing Program

The existing capital program has made accomplishments since the 2001 Plan. There have been a wide array of projects, including flood hazard reduction, stream

improvement projects, and retrofit of water quality and flow control facilities. (See Chapter 4 for a complete list of projects.) From 2002 to 2014, the existing program has spent, on average, approximately \$330,000 per year on capital projects. The existing program has relied on grant funding and outside partnerships to implement many of the projects.

6.7.2 Capital Program Level of Service Alternatives

During the next several years, the Utility will be exploring basin planning, maintenance programs and asset management programs that should reduce capital expenditures. Currently, however, some capital projects are required that address capacity and misaligned infrastructure. The City developed a list of capital projects in 2014. These projects were identified by reviewing the 2001 Plan, conducting staff interviews, residential surveys, and comments received at an Open House.

Two hundred thirteen (213) issues were identified. Of these, 125 were determined to be City responsibility. Sixty of these were maintenance issues; and the remaining sixty-four (64) required public capital. In 2014, 17 of the projects had been completed, or were in process. Working with the Citizen Advisory Committee, the City developed a weighted scoring scheme (matrix) to determine priority for the remaining 47 projects. The matrix considered flooding hazard reduction, environmental improvement, community support, impacts to the maintenance program, and risk associated with the projects. The projects were assigned a “Rank #” based on the results of the matrix. The matrix can be found in Appendix H. The results of the ranked projects are in Table 6-5.

TABLE 6-5: RANKED CAPITAL IMPROVEMENT PROJECTS

RANK #	Capital Improvement Project	Total Matrix x Score	Planning Level Estimated Costs (2015 Dollars)
In Progress*	Decant facility, Naketa Beach, 61st culvert	N/A	\$3,309,824
1	Chennault Beach Street Drainage Improvements	60.392	\$3,811,000

2	Mukilteo Lane Storm Drainage Improvements	58.56	\$6,591,000
3	84th St SW (West) Storm Drainage Improvements	57.064	\$1,240,000
4	64th Pl W Street Drainage Improvements	55.888	\$1,202,000
5	66th Pl W Street Drainage Improvements	55.384	\$1,425,000
6	Central Drive Storm Drainage Improvements for Big Gulch Basin	55.056	\$5,267,000
7	62nd Pl W/Canyon Drive Storm Drainage Improvements	54.384	\$2,852,000
8	10th & Loveland Storm Drainage Improvements	48.88	\$794,000
9	Horizon Heights Storm System Extension	48.72	\$150,000
10	Lighthouse Park Storm Drainage Improvements	47.544	\$581,000 (not in financial analysis)
11	Whisper Wood Pond W	47.048	\$190,000 (not in financial analysis)
12	Upper Chennault Culvert Improvement (Access Road)	45.552	not in financial analysis
13	Central Drive Storm Drainage Improvements for Chennault Beach Basin	43.208	not in financial analysis
14	92nd/Hargreaves Storm Drain Extension	38.872	not in financial analysis
15	88th St (East) Storm Drainage Improvements	38.536	not in financial analysis
16	5th Street Storm Drainage Improvements	37.536	not in financial analysis
17	Park Avenue Storm Drainage Improvements	31.032	not in financial analysis
18	Park Avenue Tide gate	29.192	not in financial analysis
19	63rd Pl W Storm Drainage Improvements for Big Gulch Basin	27.528	not in financial analysis

20	63rd Pl W Storm Drainage Improvements for Chennault Beach Basin	27.36	not in financial analysis
21	Japanese Gulch/Brewery Creek Headwater Wetland Creation/Enhancement	25.36	not in financial analysis
22	88th St (West) Storm Drainage Improvements	25.36	not in financial analysis
23	Goat Trail Pipe Restoration	25.024	not in financial analysis
24	Lamar Drive Road Reconstruction	25.024	not in financial analysis
25	2nd Street Pipe Restoration	24.856	not in financial analysis
26	Smugglers Gulch/Big Gulch Basin Analysis	23.528	not in financial analysis
27	Centralized Storm Drainage Facilities for Bluff properties - formed through LID	23.36	not in financial analysis
28	Cornelia/3rd Storm System Extension	23.36	not in financial analysis
29	63rd Pl W Slope Stabilization	22.528	not in financial analysis
30	53rd Ave Traffic Calming Improvements	20.52	not in financial analysis
31	Brewery Creek Outfall	20.52	not in financial analysis
32	92nd St Park Wetland Restoration & Expansion	18.688	not in financial analysis
33	Daylight Japanese Gulch Creek	18.352	not in financial analysis
34	2nd Street Storm Drainage Extension	18.184	not in financial analysis
35	92nd/50th Pl Wetland Restoration & Expansion	17.016	not in financial analysis
36	102nd St SW Storm Drainage Improvements	13.848	not in financial analysis
37	Upper Smugglers Gulch Restoration	11.68	not in financial analysis
38	Upgrade Culverts for Fish Passage (Japanese, Big Gulch, Picnic Pointe) - Include Evaluation of culverts for fish passage in those Basins not currently designated as fish bearing streams	11.512	not in financial analysis

39	Bioremediation Site	10.84	Not in financial analysis
40	North Fork of Big Gulch Stream Restoration & Wetland Creation (privately owned)	9.68	not in financial analysis
41	44th Ave Storm Drainage Improvements	9.512	not in financial analysis
42	53rd Ave Storm System Extension	8.848	not in financial analysis
43	Purchase vacant property @ 106xx 56th Ave W (work with Mukilteo School District)	5.68	not in financial analysis
44	Lower Big Gulch Creek Restoration (privately owned)	5.512	not in financial analysis
45	Cyrus Way Wetland Preservation (privately owned)	3.008	not in financial analysis
46	Purchase vacant land to restore natural detention areas (can apply to all basins)	0.504	not in financial analysis
47	Harbour Pointe Blvd & 47th Pl W Stream Corridor Enhancement (privately owned)	0.504	not in financial analysis

* PROJECTS IN PROGRESS: The financial plan includes projects that were already underway or had secured funding at the time this ranking was completed. These projects are not included in the ranking, but are projected to be completed. Other projects initially considered were not ranked because they were determined to not be the Utility's responsibility.

*	61st Culvert Replacement	IN PROGRESS
*	City Decant Facility retrofit	IN PROGRESS
*	Naketa Beach Outfall	IN PROGRESS

*	49th Ave W Bioretention Swale	Complete
*	44th Ave W Bioretention Swale	Complete

Not ranked	56th Ave W Bioretention Swale	Initial project scope exceeded budget; need grant funding
Not ranked	86th Place Evaluation	Complete as Roads project
Not ranked	61st Pl W Road Stabilization	Determined to be roads project

The City had previously prepared planning level cost estimates for three projects (Ranks 10, 11, and 12). Additional planning level cost estimates were completed by Brown & Caldwell for the top 8 ranked projects, and projects that were already in process, but not completed (Appendix E). These figures are represented in Table 6-7 and discussed further in the financial analysis in Chapter 9. Implementation of the CIP projects is planned over a 15 year timeframe, to reduce increases to the Utility rate. A map of the project locations is included as Figure 6-2.

The capital project list should be continually re-evaluated to determine whether higher levels of maintenance and asset management will help resolve identified localized flooding areas. A summary of the LOS alternatives for this program area is provided in Table 6-6.

TABLE 6.6: CAPITAL PROGRAM - LEVEL OF SERVICE SUMMARY
LOS 1 – Implement CIPs in next 15 years
<p>Capital Program</p> <p>Current program has included an average of \$330,000 per year to solve critical flooding problems, and to a much lesser extent water quality problems, and stream/wetland enhancements.</p> <p>Maintain proposed level of CIP funding for next six years. Reevaluate the CIP list as basin planning comes on board.</p> <p>The intent is that with an asset management plan, the Utility would not be responding reactively to as many emergency repairs. Eventually, regular maintenance practices and projects in the basin plans may override the need for the current CIP list.</p> <p>Staffing: Funding for staffing is included within the CIP project in the Financial Analysis.</p>

6.7.3 Capital Program Recommended Program

The minimum LOS 1 is recommended by staff. LOS 1 was considered to address the projects with highest need. The recommended program does not include any debt service, but instead spreads out the cost of the CIPs over 15 years. The LOS1 provides capital projects at a rate that is sustained by the new Surface Water Utility rate. With the proposed basin planning (see Chapter 7), the CIP list should be reevaluated with each completed basin plan.

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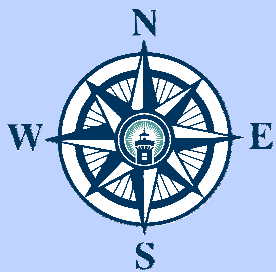


Capital Projects Areas, Identified by Priority Rank

☐ All Other

Rank #	NOTE
26, 27, 38, & 46	These projects are conceptual in nature, and cover a wide geographic range. They do not have specific mapped locations.

Scale = 1:21,000 Revised June 30, 2015



POSSESSION SOUND

City of
EverettBoeing
Everett
Facility

Snohomish County Paine Field Airport

Snohomish County

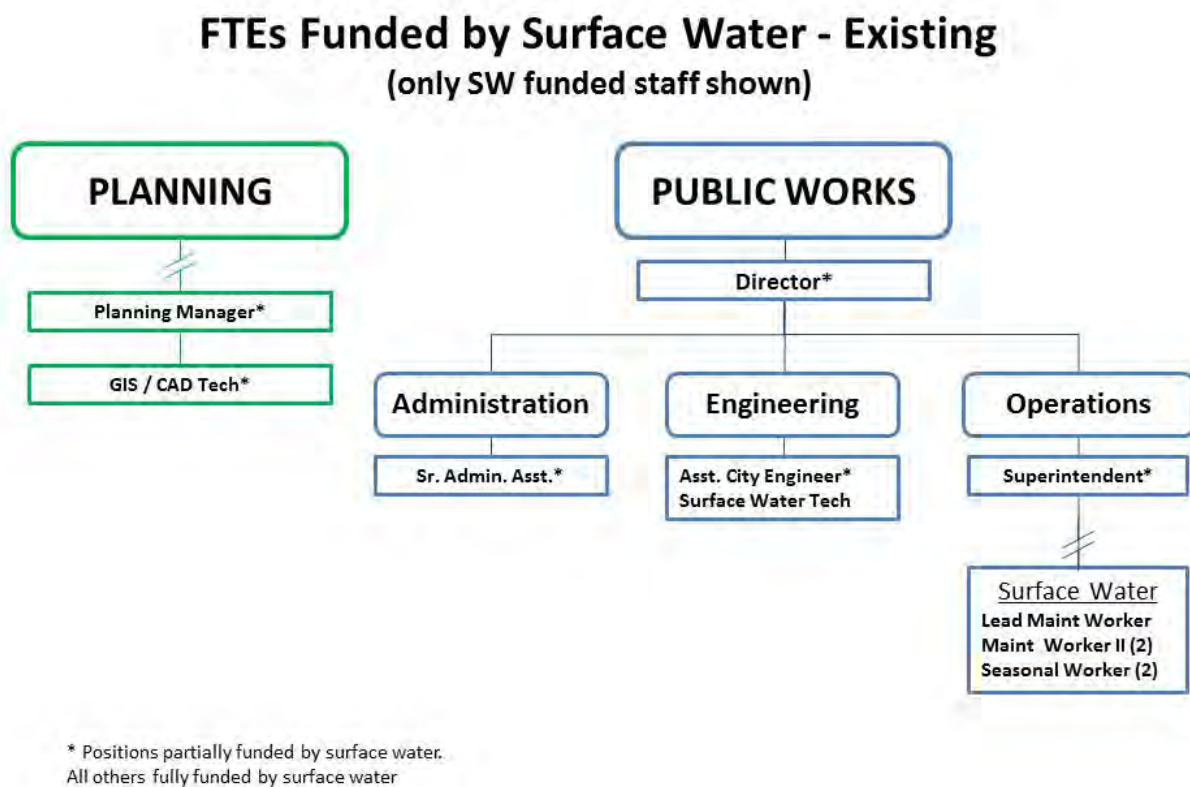
The City of Mukilteo disclaims any warranty of merchantability or warranty of fitness of this map for any particular purpose, either expressed or implied. No representation or warranty is made concerning the accuracy, completeness, or quality of data depicted on this map. Any user of this map assumes all responsibility for the use thereof, and further agrees to hold the City of Mukilteo harmless from and against any damages, loss or liability arising from any use of this map.

6.8 Utility Staffing and Organization

6.8.1 Current Staffing

The Surface Water Utility is staffed in the Public Works Department which provides management and administrative support, engineering, capital project delivery; NPDES permit monitoring and reporting, and field operations. The Surface Water Utility fund also supports staff in the Planning and Community Development Department.

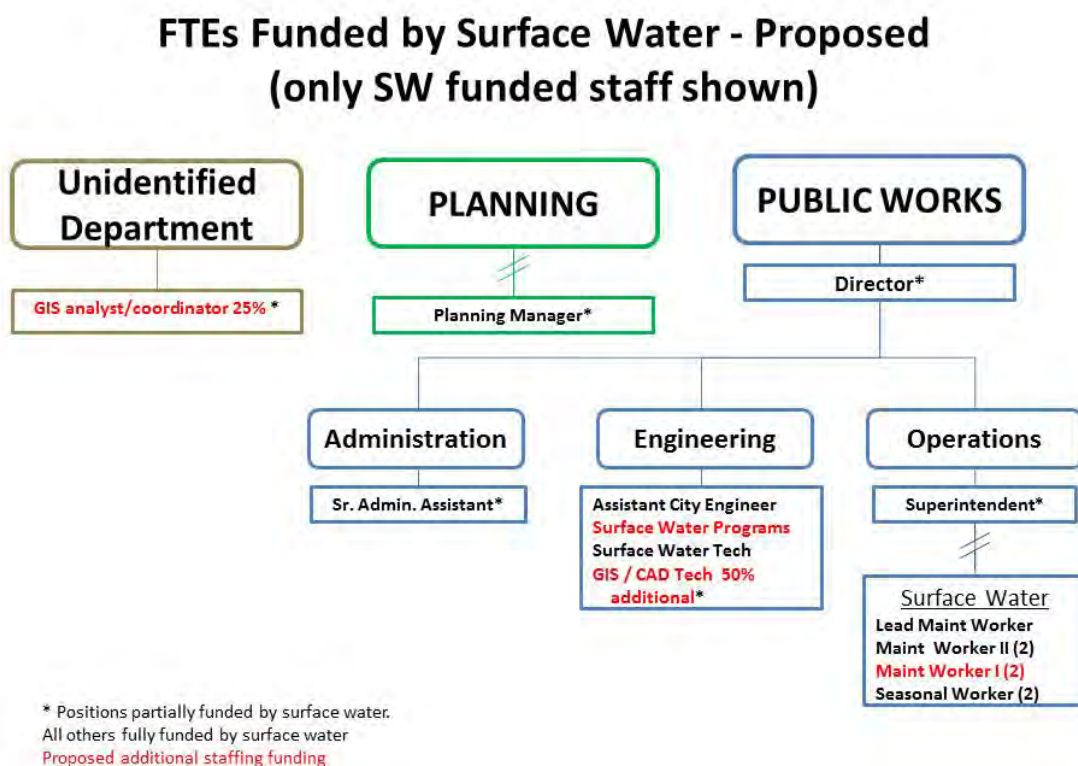
FIGURE 6-3: FTES FUNDED BY SURFACE WATER – EXISTING



6.8.2 Proposed Staffing

The Surface Water Utility staff in 2014 prepared a gap analysis for the current NPDES Phase II requirements. Staff identified numerous areas within the permit requirements where the City had difficulty meeting minimum requirements with the current staff level. As a result of this analysis, staff is recommending 3.75 FTE be added to the Surface Water Utility. This analysis fits within the Financial Analysis in Chapter 9.

FIGURE 6-4: FTES FUNDED BY SURFACE WATER - PROPOSED



Operations and Maintenance: Due to the increase in inspection and maintenance responsibilities (discussed in Section 6.2), it is recommended that 2 additional Level 1 Maintenance Staff be added.

Engineering: In order to allow the Surface Water Technician to focus on engineering development services, conduct facility inspections, and business outreach, it is recommended that a new 1.0 FTE position be created. This position would manage many of the surface water programs, act as coordinator for the NPDES Permit, provide technical support to residents and staff, and manage the outreach program. This position would report to the Assistant City Engineer.

GIS: In order to support the growing GIS needs for the Utility, it is recommended that the Utility support an additional 0.5 FTE GIS Technician. It is also recommended the Utility support a 0.25 FTE GIS Coordinator (or equivalent). The GIS Coordinator would be instrumental in developing appropriate GIS asset management tools and supporting

the Utility GIS infrastructure by developing processes for version updates and published data. If the Utility managed the GIS Technician, the position would report to the Assistant City Engineer. The Utility does not anticipate managing the GIS Coordinator because it is assumed this position will provide City-wide GIS support, with 0.25 FTE being paid for by the Utility. Table 6.5 gives an overview of the proposed staffing plan.

TABLE 6-7: OVERVIEW OF PROPOSED STAFFING PLAN

Position	Division	Additional Surface Water FTE	Total Surface Water FTE	Major Responsibilities
GIS Technician*	Undetermined *	0.5	0.75	<ul style="list-style-type: none"> • Georeference public and private stormwater facilities • Maintain GIS stormwater database • Make GIS asset updates • Assist with asset management implementation • Create stormwater maps
GIS Coordinator*	Undetermined *	0.25	0.25	<ul style="list-style-type: none"> • Create GIS Program • Manage stormwater database structure • Recommend asset management implementation solutions
Surface Water Programs Manager	Engineering	1.0	1.0	<ul style="list-style-type: none"> • NPDES Permit coordination • Manage Outreach programs • Manage Technical Programs • Coordinate NPDES related trainings
Maintenance Staff	Operations	2.0	5.0	<ul style="list-style-type: none"> • Perform inspections and maintenance on stormwater assets

* Currently, the City staffs a 0.75 FTE GIS /CAD Technician. How the additional Surface Water GIS positions are integrated into the City's larger GIS Program remains to be determined. The Surface Water GIS needs require both basic and advanced skill sets.

In addition to the recommended 3.75 FTE for existing operations, the implementation of the Capital Project program may require additional staffing to support project development, permitting, engineering, contract administration and construction inspection. Funding for this effort has been budgeted separately for each proposed CIP project. A staffing capacity analysis should be reviewed at the time the Capital Projects are scoped.

6.9 Summary of Recommended Programs Level of Service

The recommended level of service for each program is one that balances the Surface Water Utility needs over the next six years and the desire to minimize the financial impacts to the residents and businesses of Mukilteo. The recommended level of service, LOS 1, reflects the minimum programs necessary to meet NPDES requirements.

For Utility programs, the current level of service and a LOS 1 alternative were considered. In two instances, a LOS 2 alternative was considered. Only these few options were considered in order to balance the increase in regulatory requirements with utility costs. Utility staff recommends implementation of LOS1 for all program areas, with the exception of Public Outreach and Engineering Development Services, where a LOS 2 option is recommended. Another factor in selecting LOS 1 is the Utility will be collecting significant information about the future needs throughout the City after completing the basin plans and asset condition assessments. After compiling and assessing all of this data, the Utility will have much better information to prioritize needs.

Chapter 7: New Programs to Meet Utility Goals

7.1 Introduction

The City and the Utility value a flourishing natural environment, a healthy built environment, and clean air and water as evidenced in the Goals set forth in the *Comprehensive Plan*. The Surface Water Utility plays a major role in developing sustainable strategies for the City's natural resources. As mentioned in Chapter 5, by managing surface waters as a renewable resource, the City can support the goal of a flourishing natural environment

Several additional programs to achieve sustainability are outlined in Sections 7.2-7.8. The Utility's intent is to formalize these programs, with appropriate funding levels to provide a framework for future operations. These programs are necessary to achieve the Goals outlined in Chapter 5, and will eventually bring many of the City's stormwater programs to a LOS2 alternative. Appropriate Performance Measures for each of these Programs are outlined in Chapter 8.

7.2 Basin Planning

Chapter 13.12.070 Studies and basin plans of City of Mukilteo Municipal Code outlines that:

The city may, as appropriate or necessary, conduct studies and develop basin plans for review and adoption by the city council. Basin plans shall be developed according to adopted engineering standards. Once a basin plan has been adopted and implemented, such plan shall supersede the requirements of this chapter; provided, that the basin plan and basin-specific requirements provide an equal or greater level of water quality and stormwater control protection. (Ord. 1222 § 2 (Exh. A) (part), 2009)

There are several factors that make basin planning a compelling approach for the City:

- The City is largely built out, with few large areas remaining for development stormwater facilities that meet today's standards.

- The preferred method for stormwater management is through onsite infiltration. While the City fully supports infiltration as a preferred alternative, the City's recent experience with exploring infiltration indicate that these methods may be of limited value in Mukilteo due to steep slopes and our understanding of underlying geology.
- The Department of Ecology recently released draft guidance on a Stormwater Control Transfer Program that is applicable to Phase I and Phase II NDPES Permittees. The Transfer Program will require a watershed planning process.

Each of these factors is considered in more detail below.

7.2.1 Limited Stormwater New Development Opportunities

The *Comprehensive Plan* gives a detailed analysis of the development potential within the City. Generally speaking, new development potential is limited in the City as many parcels have been developed. Some redevelopment projects will be required to meet the current development standards. However, there are few opportunities to address stormwater issues through the development process.

7.2.2 Onsite Infiltration

The City will continue to explore infiltration as its first option, but the geologic studies conducted by Aspect Consulting and the City's retrofit project PITs indicate that the original geologic classification of soils is outdated. Where mapping originally assumed Vashon Basal Till of being few tens of feet thick, the field explorations have shown Subglacial Meltout Till that is over 100 feet thick, making even deep infiltration infeasible in the tested areas. The City intends to follow the 2012 SWMMWW for infiltration feasibility testing at the site level. If the results of these site-scale tests continue to show that infiltration is infeasible, other options will need to be identified and considered to reduce flows and protect water quality.

7.2.3 Stormwater Control Transfer Program

From Ecology's website:

The draft guidance document lays out features of an alternative program (a Stormwater Control Transfer Program) that Western Washington State municipal stormwater Permittees (Permittees) can implement to satisfy permit requirements associated with flow control, runoff treatment,

and/or low impact development triggered at new and redevelopment sites. This stormwater management approach directs rehabilitation efforts to watersheds within a jurisdiction (referred to as priority watersheds) where they will provide more immediate environmental benefit. Permittees establishing a Stormwater Control Transfer Program that includes out-of-basin transfers must seek Department of Ecology (Ecology) approval of their alternative program (through Appendix 1, Section 7 of the Western Washington Municipal Stormwater Permits).

Ecology does not propose relaxing the requirements, but allowing local governments to use a strategy to shift stormwater improvements triggered by the existing requirements to higher priority watersheds. The anticipated advantage of this type of program is that efforts will focus on priority watersheds at a rate greater than the default site-by-site application of the municipal permits' minimum requirements.

If Mukilteo chooses to use this approach, basin plans will need to be developed to identify higher priority watersheds. The *Strategies Plan* is a good start to this work.

In 2013, the City began a basin-wide approach to stormwater management when it developed the *Strategies Plan*. The *Strategies Plan* used Department of Ecology's Puget Sound Characterization (Stanley et al. 2011) and further divided each watershed into 36 Project Analysis Units (PAUs) in Mukilteo (and several in surrounding jurisdictions). Each PAU was ranked into management categories of "Preserve," "Repair," and "Targeted Management." The *Strategies Plan* then recommends a suite of actions for each PAU based on the rankings.

The recommended suite of actions are general and do not identify specific projects for implementation. In 2014, the City began to implement the *Strategies Plan* with the *Retrofit Project*. The Retrofit Project identified, prioritized, and selected stormwater retrofit projects in three PAUs; Big Gulch North, Big Gulch South, and Picnic Point Ravine. These PAUs had been identified as the highest priority for stormwater retrofits in the *Strategies Plan*.

Ecology funded the design of the retrofit projects. During site specific explorations through Pilot Infiltration Tests (PITs), it was discovered that the sites do not infiltrate. Even deep infiltration was deemed infeasible after explorations up to 100 foot depths.

The basin plans should continue to build on the *Strategies Plan* and continue to use an integrated approach to evaluate and address problems related to flooding, water quality and stream degradation. These plans will require more detailed system assessments, a comprehensive analysis of existing infrastructure conditions, localized flooding problems, steep slopes, and potential for regional facilities, both large and small.

7.3 Asset Inventory (Address Aging Infrastructure)

The City's stormwater infrastructure is of varying age and, presumably, of varying condition. The average life expectancy of stormwater infrastructure is 50 years. Parts of Old Town have infrastructure that dates back to the original settlements. Even though some of the newer portions of Mukilteo were incorporated in the 1980s, the infrastructure was in place long before that, making it 40 to 50 years old. The Utility does not currently project future needs for asset replacement. As a result, the Utility responds to infrastructure failure in a largely reactive approach. This means that when the Utility responds to unexpected failures, the funding is pulled from other projects or programs.

The Utility has never done a comprehensive analysis of pipe conditions. The Utility recognizes the need to move toward proactive asset management as a higher level of service and to provide better financial management of the Utility. The initial steps to building an asset management program include data gathering, documentation of the system, and condition assessment. The City has made efforts over the past several years to inventory its assets in GIS. However, much of the work has not been field verified. A new GIS Technician, in combination with the Public Works crews can begin to verify stormwater asset mapping.

7.3.1 Condition Assessments

Condition assessment of the City's infrastructure is the first step to building an asset management program. The condition assessment would include videoing the Utility's underground stormwater pipes. These videos would provide the age and condition of pipes, catch basins, manhole structures and culverts. This information can then be used to provide condition rating scores on the assets. The condition rating scores are then used to determine risks associated with failure and a prioritization list can be developed for replacement, which would include a recommended schedule. Based on the prioritization and recommended schedule, a long term plan will be built. The condition assessment data would be housed in the GIS. This effort would help update the City's stormwater inventory maps to locate the Utility's entire drainage infrastructure.

The condition assessment will inform the basin plans by providing a comprehensive look at the needs within the basins and should be done as part of the basin planning efforts. Additionally, the mapped infrastructure will help better define basin boundaries, as they have shifted with development. The condition ratings will further help identify possible solutions to existing water quality problems and act as a tool in completing illicit connection inspections.

The Utility should research tools to incorporate asset management planning, including the purchase of GIS-based asset management software, with mobile field applications. Other options could include writing programs within the GIS, but this alternative requires high-level GIS staffing. The GIS-based software allows for updates to condition assessments through regular inspections, and gives staff the access to the most recent data. As noted in Chapter 6, field staff currently use outdated paper map books to trace lines and complete their work.

The objective is for the Utility to perform inventory and condition assessments over the next five to ten years, through contracted services. This information would allow the Utility to better schedule repairs and replacements of existing infrastructure. This method of managing aging infrastructure would be more cost effective in the long term.

Table 7-1: What is Asset Management and What Does it do for the City?

Asset Management is a suite of practices that maximizes the cost-effective use of capital assets over the life of the asset. It gives the Utility the ability to get the most use of an asset at the lowest long-term cost. It allows the Utility to provide the defined level of service at the lowest cost. Asset Management is not just an evaluation tool. It helps preserve the system by reducing premature failure through regular maintenance.

An Asset Management Program Can:

1. Outline consequences of funding shortfalls and associated risks
2. Give predictability, transparency, and easily understood funding needs
3. Give sound basis for prioritizing work
4. Identify the risk exposure by asking what is the probability of failure and the consequence of failure?

7.3.2 Balance Maintenance and Preservation of Existing Infrastructure with Capital Projects

The Utility has identified over 45 capital improvement projects, 11 of which are proposed for implementation during the term of this Plan. As the Utility moves to a more proactive level of service and begins to implement an asset management plan, the Utility should begin to reevaluate the current capital improvement projects. Many Utilities that adopt a proactive asset management program find that the improved maintenance solves some of the previous flooding issues. Revisiting the list of capital projects and conducting follow up interviews is recommended before beginning any capital project. It should be recognized that some of the effects of an asset management program may take 5 years or more to be realized.

7.4 Low Impact Development

While low impact development is not new to the City of Mukilteo, it was not a program considered in the 2001 Plan. It's incorporation into City practices are shown throughout this document, especially in Chapter 6. It is highlighted here to give more comprehensive guidance for the Utility.

7.4.1 Preferred Alternative

Low impact development is the preferred alternative for all new development and redevelopment projects. The City follows the most current SWMMWW. The Utility supports this as the preferred development alternative. However, underlying geologic

conditions within the City may make many areas unsuitable for infiltration. Additionally, many areas within the City have landslide hazards due to steep slopes, precluding infiltration as an option. In these areas, amended soils and appropriate vegetation may be a viable alternative.

Through site specific PITs, it is commonly been the case that an impermeable glacial till prevents adequate infiltration. For these reasons, the Utility recommends that all low impact development or retrofit projects are carefully vetted prior to implementation. Suitable soils and PITs should be verified prior to implementation.

7.4.2 Rain Gardens and Natural Yard Care Incentive Programs

The Utility supports rain garden retrofit projects, in appropriate areas, where no risk of landslides exist. The Utility may consider a no-cost rain garden permit in order to provide technical assistance to residents wishing to retrofit their property with a rain garden. This Rain Garden Permit would help residents identify areas of steep slopes and other factors that may pose risks to the Utility, a downslope landowner, or the project proponent.

The Utility fully supports natural yard care techniques and recommends future consideration of incentive programs for compost amended soil applications, native plantings, and large conifer tree retention. The City partnered with Snohomish County and other jurisdictions to conduct a behavior change study on yard care practices. The results of this study will be used in any future programs. These incentive programs would not be available to development projects, where these techniques are required as part of the development project.

7.4.3 Emerging Technologies

Low impact development includes use of emerging technologies to help manage surface water. Much of the emphasis for emerging technologies is focused on urban drainage water quality treatment. Recent research provides compelling evidence that stormwater run through a column of bioretention media is an effective water quality treatment option (McIntyre et al 2015). Many LID practices such as bioretention and rain gardens use this as a primary method for effectiveness. Additionally, there are new proprietary

systems coming on the market every year. These proprietary systems are tested through Department of Ecology's Technology Assessment Protocol – Ecology (TAPE).

The Utility should consider the use of technologies under the General Use Level Designations (GULD) and, in some cases the Conditional Use Level Designations (CULD), if the CULD technology is in the current process of approval for GULD and has enough field evidence of effectiveness. The Utility should look for opportunities to use the full suite of emerging technologies in its own applications and in private development projects. Because of the nature of Mukilteo's geology, every option should be considered, including:

- Pervious pavements (both asphalt and concrete),
- Several types of water quality filter systems available through different manufacturers. One type includes underground vaults and above ground plantings of trees and shrubs to filtrate stormwater through a soil/plant media.
- Chemical treatment of construction site runoff to help sediment drop out from turbid water (now being evaluated by Ecology's C-TAPE program)
- Underground injection of stormwater into the ground after sufficient water quality treatment
- Small, dispersed infiltration projects in public right of way.

The objective of the Utility is to allow the best stormwater treatment possible, while recognizing that infiltration in Mukilteo may present design challenges.

7.4.4 Staffing

These new program areas will require additional staff in some areas in the short term, especially in GIS. The additional staff are considered in Chapter 6 and have been accounted for in the Financial Analysis (Chapter 9). Once the initial investigations and results are complete for each of these new programs, the City should determine whether staffing levels are appropriate.

7.5 Private Property and Public Drainage Systems

Historically, there has been uncertainty regarding the City's responsibilities with respect to drainage on private property. The uncertainty is most often created because of

incomplete system ownership records. In cases where the City has drainage easements, it is clear the City is responsible for maintenance of these systems. Conversely, where the City has no easements, these systems are considered private (i.e., there is a presumption that the system is not publicly owned if there is no easement). Some of these systems carry primarily (if not entirely) right-of-way water through private properties. Other systems enter and exit city right-of-way, with the network traveling through private property.

City staff routinely receive questions from citizens when problems occur on these private drainages. Most often, a citizen or a group of citizens will request that the City solve a problem that exists on private property. From a legal perspective, when there is no easement granted to the public entity, the City is not responsible for solving problems on private property. However, there may be situations where there is an overriding public benefit to the City maintaining these segments (such as solving flooding for an entire neighborhood, or a City street). In these cases, the City should consider accepting improvements on private property as a public work and assume responsibility, if not ownership, of the system for future maintenance.

As part of the asset inventory process described in Section 7.3, the Utility should begin to record in the GIS database where easements exist currently. This process will help assist staff in answering public questions. Further evaluation of areas where the system carries public water with no easements could then be made. This evaluation would allow the Utility to determine whether it is in the public interest for the City to obtain easements and take on the responsibility. These determinations would be based on clear and consistent decision guidelines. These guidelines require attorney review, but a draft guidance policy has been created for consideration below.

Three decision outcomes are considered, and should be applied to each situation:

1. There is clear documentation of an easement and City responsibility: Use of utility funds is appropriate.
2. There is no clear documentation of an easement AND there is public benefit to providing assistance:
 - a. An operational decision is made that use of utility funds is appropriate AND
 - b. A formal easement is pursued at no cost to the City.

3. There is no public benefit to providing assistance: Use of utility funds is not appropriate.

The Draft Decision Guidelines presented above can help determine the three possible decision outcomes. These draft guidelines should consider the financial impact to the Utility and be reviewed further by the City Attorney and City Council. It is anticipated this will not happen until after completion of this Plan Update.

7.6 Looking Forward

The following is a list of other recommendations to guide the Utility beyond the next five years, plus some areas that the Utility has explored since 2001 and should continue to explore:

- Incentive programs for surface water retrofits (e.g. rain gardens)
- Tree canopy as a surface water benefit in the Urban Forestry Management Program Plan; incentive program for tree retention
- Continue to support and implement green stormwater infrastructure
- Continue green stormwater infrastructure use (e.g. rain gardens) in the right-of-way
- Have clear decision guidelines regarding the use of Utility funds for work on private property
- Have clear decision guidelines on use of public funds to correct illicit connections
- Continue to pursue grant funds for capital projects

Chapter 8: Surface Water Utility Performance Measures

8.1 Introduction

This section describes performance measures to assess the Surface Water Utility's progress towards meeting the goals outlined in Chapter 5, the level of service recommendations made in Chapter 6, and new program recommendations made in Chapter 7. Performance measures are a tool for the Utility to assess whether or not it is achieving its goals, and to provide an opportunity to address any identified needs. The performance measures are intended to be assessed by the Utility annually. Based on these annual assessments, the Utility can make any necessary program adjustments to better meet the performance measures. Programs and performance measures that are regulatory requirements are indicated with an asterisk.

Performance measures are identified as either qualitative or quantitative, as dictated by the type of program being assessed. Some programs lend themselves well to quantitative measurements, while other programs can be assessed with qualitative measures. For qualitative performance measures, the evaluation may simply be whether work items identified in the plan were completed. Some performance indicators are set out as one-time goals (for example, implementing a new program). Some performance measures have a target deadline within the planning timeframe.

Performance measures are outlined by Utility Program areas, and are aligned with the level of service analyses in Chapter 6 and new programs in Chapter 7.

8.2 Operations and Maintenance (O&M)

The performance measures for operations and maintenance are primarily based on comparing inspection and maintenance activities scheduled for each asset type versus the actual maintenance accomplished, and the timeframe within which it was accomplished. Specific key performance measures are as follows:

8.2.1 O&M Implementation Measures

- Research and make recommendation on GIS-based software that allows field tracking and reporting of inspection and maintenance work that is tied to the asset (by December 2018)
- * Restore decant facility to be in compliance with regulatory requirements (by December 2017)
- * Revise and update Stormwater Pollution Prevention Plan (SWPPP) for Public Works facility, within 3 months of decant facility being operational (March 2018)
- Add two additional Stormwater maintenance staff by December 2018, or sooner
- Develop regular ditch inspection and maintenance program
- One-time field verify GIS locations and vertical data for 50% of catch basins per year as part of inspection program (by end of 2018)
- One-time field verify GIS locations and vertical data for permanent stormwater treatment and flow control BMPs/facilities at 50% per year (by end of 2018).
- * Re-evaluate program status upon issuance of the new NPDES Permit to assure continued compliance, anticipated in 2018

8.2.2 O&M Annual Key Performance Indicators

- * Inspect ½ of City-owned catch basins per year, maintaining those that exceed the maintenance threshold.
- Document sediment levels in catch basins in order to build a database that captures sediment loading rates. This data will help build evidence for adjusted maintenance frequencies specific to those assets, rather than generic standards.
- * Record street sweeping efforts (in lane miles per year) and identify which streets are swept at which frequencies.
- * Record inspections of publically owned or operated permanent stormwater treatment and flow control BMPs/facilities, maintaining those that exceed the maintenance threshold. Permit requires records of 95% of completed inspections.
- * Record ditch inspection and maintenance efforts
- * Track and record number of stormwater service requests completed (that are not part of regular maintenance items)

- Track and record length of time to initial response on service requests
- * Record spot check of potentially damaged permanent stormwater treatment and flow control BMPs/facilities after major storm events.

Items noted with an asterisk are a current regulatory requirement. Maintenance frequencies may need to be adjusted to meet any new frequency requirements in the upcoming 2018-2023 NPDES Permit.

8.3 Engineering Development Services

Performance indicators for Development are primarily based on adequate standards that comply with regulatory requirements, providing guidance to the developers, and reasonable response time in development review.

8.3.1 Engineering Development Services Implementation Measures

- Revise the Mukilteo Development standards and Mukilteo Municipal Code for stormwater to be consistent with the SWMMWW (by December 2017).
- Update standard plan designs, to be consistent with new standards, where necessary (by December 2017).
- Develop tools for City staff and the development community to use in determining LID feasibility (ongoing, as part of Basin Planning, at rate of 1 basin per year).
- Revise development inspection schedule tracking to align with regulatory requirements for easier tracking (by December 2016).
- Develop a separate stormwater permit (by December 2016).
- Develop a short-form Stormwater Pollution Prevention Plan for small projects (by December 2016).
- Develop guidance documents for development on stormwater requirements (ongoing; by December 2016)
- Research and consider a no-cost retrofit rain garden permit.
- * Complete review of Development Codes and Standards to assure there are no barriers, or unnecessary competing needs, to implementing Low Impact Development (LID) as the preferred alternative (by December 2016).

8.3.2 Engineering Development Services Annual Key Performance Indicators

- * Track number of development projects needing stormwater review
- * Track number of stormwater inspections on development projects
- * All development permit applications meet the most current SWMMWW
- Track and record review time of development permit applications. Standard is stormwater review completed within 4 weeks of receipt by Engineering Department.

8.4 Technical Assistance

Technical assistance is provided both internally and externally. Performance measures for regulatory requirements are based on the NPDES Permit minimum requirements versus actual implementation. In some cases, the Utility may find it beneficial to establish program elements that are beyond minimum requirements.

8.4.1 Technical Assistance Implementation Measures

- * Purchase and implement training on Illicit Discharge Detection and Elimination (IDDE) equipment to fully implement the City's current IDDE Guidance document Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments, Center for Watershed Protection, October 2004 (by July 2017)
- * Implement training programs for City staff in areas identified in the Permit (e.g. IDDE, BMPs) (March 2016)
- Develop and implement a Local Source Control Program (December 2017)
- Review and implement business outreach program (December 2017)
- Research potential to join Department of Ecology's Local Source Control Partnership to supplement Business Outreach program (December 2017)
- * Evaluate City programs in light of new NPDES Permit, anticipated in 2018, and adjust performance measures, if necessary
- Hire and train a 0.75 FTE in Engineering (in conjunction with the 0.25 FTE identified in Outreach)

8.4.2 Technical Assistance Annual Key Performance Indicators

- * Track and record number of NPDES deadlines and requirements not met (as specified in the NPDES Annual Report to Ecology). The target is zero
- * Number of meetings with other City Departments to review permit compliance (for example Public Works, Planning). Target is 6 per year per department
- * Complete Ecology's required Annual Surface Water Management Program Plan and post on website annually by March 31
- * Track and record number of surface water service requests where technical assistance is provided
- * Track and record time it takes to respond to surface water service requests where technical assistance is provided
- * Track and record number of investigations (and initial responses) to all non-emergency (i.e. non-spill related) water quality and drainage complaints
- * Track and record number of investigations (and initial responses) to all emergency (i.e. spill related) water quality events
- * Track and record the response time to abate emergency water quality events
- * Track and record number of water quality code enforcement cases
- * Track and record number of drainage code enforcement cases
- per year)
- * Continue to attend Stormwater Working Group Caucus meetings (as scheduled)
- * Continue coordination with City departments to ensure other departments are meeting NPDES Permit requirements (monthly meetings with Public Works; through Planning/Engineering meetings)
- * Continue to attend quarterly NPDES Permit Coordinators meetings (at least 3 per year)

8.5 Community Stewardship*

Over the past several years, the City has participated in regional and local outreach efforts designed to educate and foster behaviors that protect the environment. A recommendation of this plan is to enhance programs that provide a direct link to protection and improvement of water quality.

8.5.1 Community Stewardship Implementation Measures

- Adapt regional outreach examples to develop a comprehensive stormwater outreach program for Mukilteo
- Partner with groups already active in the community, such as BeachWatchers and Snohomish Conservation District to integrate stormwater messaging into their existing programs
- Develop a business outreach program (Local Source Control)
- Support natural yard care techniques
- Support tree retention and preservation programs in the City
- Support low impact development retrofits in areas that are suitable
- * Implement recommendations found in the study completed in partnership with Snohomish County on Natural Yard Care
- Hire and train a 0.25 FTE (in conjunction with the 0.75 FTE identified in Technical Assistance)

8.5.2 Community Stewardship Annual Key Performance Indicators

- Number of residents involved in outreach programs

8.6 Monitoring and Research*

The City primarily participates in monitoring and research through contribution to the Regional Monitoring Program through the NPDES Permit.

8.6.1 Monitoring and Research Implementation Measures

- * During the 2018 Permit cycle, the City should evaluate the Opt-in option for the RSMP Program to assure that the regional program is providing locally relevant information
- * At the next NPDES Permit cycle, the City should evaluate the RSMP Program and whether it wants to continue to opt-in to the RSMP
- Collaborate with neighboring jurisdictions in their monitoring program, where possible
- * Help identify and implement solutions to degraded water quality

8.6.2 Monitoring and Research Annual Key Performance Indicators

- * Contribute to Regional Water Quality Monitoring efforts under the Permit

- Continued partnership and meeting attendance with Landslide Working Group

8.7 Capital Improvement Program

This program includes capital projects to reduce flood hazards, protect and improve water quality, and enhance aquatic stream/wetland areas that are impacted by stormwater runoff. The performance measures for capital projects will be to compare recommended projects with those that have been completed. Project priorities may shift from year to year due to a number of factors. The performance indicators should always be evaluated against the current priorities.

8.7.1 Capital Improvement Program Implementation Measures

- Annually review and rank the existing CIP list to assure that newly identified projects are added (July, or during draft budget preparation)
- Periodically solicit input from community about stormwater issues in their neighborhoods (every five years)
- Determine method to assure equitable distribution of projects across the City (December 2020)

8.7.2 Capital Program Annual Key Performance Indicators

- Number of identified drainage projects completed
- Number of water quality projects (including LID) completed
- Number of stream / wetland enhancement projects completed

8.8 Basin Planning

Basin planning is a new program area for the Utility. Implementation measures for this program are considered below.

8.8.1 Basin Planning Implementation Measures

- Conduct basin plans that follow the *Strategies Plan* (average of 1 per year, although cost savings are realized by combining efforts)
- Develop basin plans in a way that capitalizes on existing information
- Complete basin plans in a timely manner, so that existing information does not age out and become obsolete (requiring additional cost to re-create)

- The basin plans reflect the uniqueness of each basin and include specific recommendations that address the unique needs of each basin
- The basin plans identify opportunities, large and small to address problems

8.9 Asset Inventory

Asset inventory and management is a new area for the Utility. The performance measures are mostly tied to the recommendations of this plan, capitalizing on existing resources and other NPDES inspection requirements.

8.9.1 Asset Inventory Implementation Measures

- Review and recommend a GIS-centric asset management software system (proprietary or in-house) that meets the needs of the Utility (both in Operations and Engineering) (December 2020)
- Implementation of an inventory and condition assessment program (can be as part of a basin plan) (December 2021)
- Update GIS mapping to include all stormwater facilities (public and private) (December 2017)
- Update GIS mapping to include stormwater easement information (December 2019)
- Develop a process that captures newly developed stormwater facilities in the GIS (December 2017)
- Utility has hired an additional 0.5 FTE for GIS Technician- level position (December 2016)
- Utility supports a 0.25 FTE for GIS Coordinator-level position
- An electronic map book (or alternative) with asset information that is available to field staff in real time (December 2020)
- *Update GIS mapping to include all discharge points (February 2018)

8.9.2 Asset Inventory Annual Key Performance Indicators

- Lineal feet of storm assets inventoried with condition assessments
- Number of stormwater facilities mapped in the GIS
- Number of easements mapped in the GIS

8.10 Low Impact Development

8.10.1 Low Impact Development Implementation Measures

- Support tree retention and preservation programs in the City
- Support LID retrofits in areas that are suitable
- * Complete Code review
- * Implement recommendations found in the study completed in partnership with Snohomish County on Natural Yard Care

8.10.2 Low Impact Development Annual Key Performance Indicators

- Number of LID retrofit projects installed in the City

8.11 Private Property and Public Drainage Systems

8.11.1 Private / Public Implementation Measures

- Development of a clear process (by October 2016)
- Identify all major stormwater pipes carrying right of way runoff with no easement (December 2019)
- Map all easements in GIS (December 2021)
- Development of an easement acquisition process, with no cost to the Utility (by December 2018)

8.11.2 Private / Public Annual Key Performance Indicators

- Number of easements mapped
- Number of easements acquired

Chapter 9: Financial Plan

9.1 Introduction

This financial plan is intended to ensure the viability of the surface water management program during the planning period. This financial plan considers the historical financial condition, current and identified future financial and policy obligations, operations and maintenance needs, and the capital projects identified in this Comprehensive Surface Water Management Plan (SWMP) Update. Furthermore, this chapter provides a review of the utility's current rate structure with respect to rate adequacy and customer affordability. Appendix H presents backup documentation related to this financial plan.

The City's Surface Water Utility (Utility) is responsible for funding all of its costs. The primary source of funding is derived from ongoing monthly charges for service, with nominal additional revenues coming from interest earned on the reserves. The City controls the level of user charges and, subject to City Council approval, can adjust user charges as needed to meet financial objectives.

The financial plan can only provide a qualified assurance of financial feasibility if it considers the total system costs of providing stormwater services, both operating and capital. This financial plan considers resources from rate revenues and reserve interest only. The following elements have been completed for this financial plan:

1. **Capital Funding Plan.** Identifies the total capital improvement plan (CIP) obligations of the planning period. The plan defines a strategy for funding the CIP including an analysis of available resources from rate revenues, existing reserves, general facilities charges, debt financing, and any special resources that may be available (e.g. grants, developer contributions, etc.). The capital funding plan impacts the financial plan through the use of the assumed rate revenue available for capital funding.
2. **Financial Forecast.** Identifies future annual non-capital costs associated with the operating, maintenance and administration of the stormwater system. Included in the financial plan is a reserve analysis that forecasts cash flow and fund balance activity along with testing for satisfaction of actual or recommended minimum fund balance policies. The financial plan ultimately evaluates the sufficiency of utility revenues in meeting all obligations, including cash uses such as operating expenses, capital outlays, and reserve contributions. The plan also identifies the future adjustments required to fully fund all utility obligations in the projection period.

9.2 Available Funding Assistance and Financing Resources

Long-term capital funding strategies must be defined to ensure that adequate resources are available to fund the CIP identified in this SWMP Update. In addition to the City's resources such as accumulated cash reserves, capital revenues, and rate revenues designated for capital purposes, capital needs can be met from outside sources such as grants, low-interest loans, and bond financing. Although the City currently only funds capital from rate revenues, all resources will be discussed. The following is a summary of the internal and external resources available to the City.

9.2.1 City Resources

Resources appropriate for funding capital needs include accumulated cash in the construction fund, rate revenues designated for capital spending purposes, and capital-related charges such as the General Facilities Charge (GFC). The first two resources will be discussed in the Fiscal Policies section (9.3.2) of the Financial Forecast. Capital-related charges are discussed below.

9.2.1.1 General Facilities Charges

A connection charge such as the GFC refers to a one-time charge imposed on new customers as a condition of development. The purpose of the GFC is two-fold: to promote equity between new and existing customers and to provide a source of revenue to fund capital projects. Revenue can only be used to fund utility capital projects or to pay debt service incurred to finance those projects. The City does not currently charge a stormwater GFC. Since the City is near build-out it would not be a sustainable revenue source if the City began to charge new customers.

9.2.1.2 Local Improvement Districts

A local improvement district (LID) is another mechanism for funding infrastructure that assesses benefited properties based on the special benefit received by the construction of a specific facility. Most often used for local facilities, some LIDs also recover related general facilities costs. Substantial legal and procedural requirements can make this a relatively expensive process, and there are mechanisms by which an LID can be rejected. LIDs have proven to be an awkward fit for surface water facilities because of the challenge of linking the special benefit to specific properties. The City may want to consider LIDs for bluff properties in the future, where there may be a more direct link of the benefit.

9.2.2 Outside Resources

This section outlines various grant, loan and bond opportunities available to the City through federal and state agencies to fund the CIP identified in the SWMP Update.

9.2.2.1 Grants and Low Cost Loans

Historically, federal and state grant programs were available to local utilities for capital funding assistance. However, these assistance programs have been mostly eliminated, substantially reduced in scope and amount, or replaced by loan programs. Remaining miscellaneous grant programs are generally lightly funded and heavily subscribed. Nonetheless, even the benefit of low-interest loans makes the effort of applying worthwhile. The major funding sources are as follows:

Department of Ecology Grants and Loans – The Washington Department of Ecology (Ecology) administers an integrated funding program for projects that improve and protect water quality throughout the state. The combined funding cycle generally begins September 1, and applicants must submit the final application by the first week of November. Ecology rates and ranks applications based on the highest-priority needs. Projects include stormwater control and treatment, nonpoint pollution abatement and stream restoration activities, and water quality education and outreach. The amount of available grant and loan funding varies from year to year based on the state's biennial budget appropriation process and the annual congressional federal budget. The sources of funding for water quality projects include:

- ◆ Centennial Clean Water Fund State Grant Program
- ◆ Clean Water Act Section 319 Federal Grant Program

- ◆ Clean Water State Revolving Fund (CWSRF) Loan Program
- ◆ Stormwater Financial Assistance Program (SFAP) beginning in FY2016

Further detail is available at <http://www.ecy.wa.gov>.

Public Works Trust Fund (PWTF) – Cities, counties, special purpose districts, public utility districts, and quasi-municipal governments are eligible to receive loans from the PWTF. Eligible projects include repair, replacement, and construction of infrastructure for domestic water, sanitary sewer, stormwater, solid waste, road, and bridge projects that improve public health and safety, respond to environmental issues, promote economic development, or upgrade system performance. Due to current funding restrictions and funding allocations, the Public Works Board has suspended the non-Construction Programs. As the economy builds, it is hoped that the Board will attempt to reinstitute these programs.

PWTF loans are available at interest rates ranging from 1.28 percent to 2.55 percent depending on the repayment term, with reduced interest rates available for all projects located in “distressed” communities. The standard loan offer is 2.55 percent interest repaid over a 5 to 20 year term. All loan terms are subject to negotiation and Board approval. Currently no local match is required and the maximum loan amount is \$7 million per jurisdiction per biennium. Information regarding the application process as well as rates and terms are posted on the PWTF website in early spring.

Further detail is available at <http://www.pwb.wa.gov>.

9.2.2.2 Bond Financing

General Obligation Bonds – General Obligation (G.O.) bonds are bonds secured by the full faith and credit of the issuing agency, committing all available tax and revenue resources to debt repayment. With this high level of commitment, G.O. bonds have relatively low interest rates and few financial restrictions. However, the authority to issue G.O. bonds is restricted in terms of the amount and use of the funds, as defined by Washington constitution and statute. Specifically, the amount of debt that can be issued is linked to assessed valuation.

RCW 39.36.020 states:

“(ii) Counties, cities, and towns are limited to an indebtedness amount not exceeding one and one-half percent of the value of the taxable property in such counties, cities, or towns without the assent of three-fifths of the voters therein voting at an election held for that purpose.

(b) In cases requiring such assent counties, cities, towns, and public hospital districts are limited to a total indebtedness of two and one-half percent of the value of the taxable property therein.”

While bonding capacity can limit availability of G.O. bonds for utility purposes, these can sometimes play a valuable role in project financing. A rate savings may be realized through two avenues: the lower interest rate and related bond costs; and the extension of repayment obligation to all tax-paying properties (not just developed properties) through the authorization of an ad valorem property tax levy. The Utility does not anticipate issuing any general obligation bonds in this financial forecast.

Revenue Bonds – Revenue bonds are commonly used to fund utility capital improvements. The debt is secured by the revenues of the issuing utility. With this limited commitment, revenue bonds typically bear higher interest rates than G.O. bonds and also require security conditions related to the maintenance of dedicated reserves (a bond reserve) and financial performance (added bond debt service coverage). The City agrees to satisfy these requirements by resolution as a condition of bond sale.

Revenue bonds can be issued in Washington without a public vote. There is no bonding limit, except perhaps the practical limit of the utility's ability to generate sufficient revenue to repay the debt and provide coverage. In some cases, poor credit might make issuing bonds problematic. The Utility does not anticipate issuing any revenue bonds in this financial forecast.

9.3 Financial Forecast

The financial forecast, or revenue requirement analysis, forecasts the amount of annual revenue that needs to be generated by user rates. The analysis incorporates operating revenues, operations and maintenance (O&M) expenses, debt service payments (if applicable), rate-funded capital needs, and any other identified revenues or expenses related to operations. The objective of the financial forecast is to evaluate the sufficiency of the current level of rates. In addition to annual operating costs, the revenue needs to also include any applicable debt covenant requirements and specific fiscal policies and financial goals of the City.

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 tests have been developed to reflect the financial goals and constraints of the City: cash needs must be met, and debt coverage requirements must be realized. In order to operate successfully with respect to these goals, both tests of revenue sufficiency must be met.

Cash Test – The cash flow test identifies all known cash requirements for the City in each year of the planning period. Typically these include O&M expenses, debt service payments, depreciation funding or directly funded capital outlays, and any additions to specified reserve balances. The total annual cash needs of the City are then compared to projected cash revenues using the current rate structure. Any projected revenue shortfalls are identified and the rate increases necessary to make up the shortfalls are established.

Coverage Test – The coverage test is based on a commitment made by the City when issuing revenue bonds and some other forms of long-term debt. As a security condition of issuance, the City would be required per covenant to agree that the revenue bond debt would have a higher priority for payment (a senior lien) compared to most other expenditures; the only outlays with a higher lien are O&M expenses. Debt service coverage is expressed as a multiplier of the annual revenue bond debt service payment. For example, a 1.0 coverage factor would imply that no additional cushion is required. A 1.25 coverage factor means revenue must be sufficient to pay O&M expenses, annual revenue bond debt service payments, plus an additional 25 percent of annual revenue bond debt service payments. The excess cash flow derived from the added coverage, if any, can be used for any purpose, including funding capital projects. Targeting a higher coverage factor can help the City achieve a better credit rating and provide lower interest rates for future debt issues.

In determining the annual revenue requirement, both the cash and coverage sufficiency test must be met and the test with the greatest deficiency drives the level of needed rate increase in any given year. Since the Utility does not have any current or forecast debt, the cash test drives the level of needed rate increases in all years of this financial forecast.

9.3.1 Current Financial Structure

The City maintains a fund structure and implements financial policies that target management of a financially viable and fiscally responsible stormwater system.

9.3.2 Fiscal Policies

A brief summary of the key financial policies employed by the City, as well as those recommended and incorporated in the financial program are discussed below.

Operating Fund Reserves – Operating reserves are designed to provide a liquidity cushion to ensure that adequate cash working capital will be maintained to deal with significant cash balance fluctuations such as seasonal fluctuations in billings and receipts, unanticipated cash expenses, or lower than expected revenue collections. The City’s current policy is to maintain a minimum balance in the Operating Fund equal to 60 days, or about 16 percent, of O&M expenses.

Capital Fund Reserves – A capital contingency reserve is an amount of cash set aside in case of an emergency should a piece of equipment or a portion of the utility’s infrastructure fail unexpectedly. The reserve also could be used for other unanticipated capital needs including capital project cost overruns. Industry practices range from maintaining a balance equal to 1 to 2 percent of fixed assets, an amount equal to a 5-year rolling average of CIP costs, or an amount determined sufficient to fund equipment failure (other than catastrophic failure). The final target level should balance industry standards with the risk level of the City. This forecast is based on maintaining a minimum balance in the Capital Fund equal to \$300,000. Although this balance is higher than industry standards, it is consistent with the cost of emergency repairs incurred in the last several years.

Currently the Surface Water Utility revenue is grouped under one line item; however, it is recommended that the City set up a separate Capital Fund for this utility, and this forecast has assumed that this will be done.

System Reinvestment – System reinvestment funding promotes system integrity through reinvestment in the system. Target system reinvestment funding levels are commonly linked to annual depreciation expense as a measure of the decline in asset value associated with routine use of the system. Particularly for utilities that do not already have an explicit system reinvestment policy in place, implementing a funding level based on full depreciation expense could significantly impact rates. This impact can be mitigated by phasing the funding in over a multi-year period, or by establishing a lower upfront funding target. A common alternative benchmark is annual depreciation expense net of debt principal payments on outstanding debt. This approach recognizes that customers are still paying for certain assets through the debt component of their rate, and intends to avoid simultaneously charging customers for an asset and its future replacement. The specific benchmark used to set system reinvestment funding targets is a matter of policy that must balance various objectives including managing rate impacts, keeping long-term costs down, and promoting “generational equity” (i.e. not excessively burdening current customers with paying for facilities that will serve a larger group of customers in the future). A separate financial policy for ongoing system reinvestment is not contemplated at this time. It is recommended to review this option once the asset inventory is complete.

Capital Funding - The City will fund prioritized capital projects on a pay-as-you-go basis, without the use of debt. In the financial forecast, these monies will be put directly into the Capital Fund and will be made available for capital project costs. We recommend that the City add a separate line item for capital in the budget to show this amount as projected. More specifically, the capital funding strategy developed to fund the CIP identified in this SWMP assumes the following funding resources:

- ◆ Accumulated cash reserves
- ◆ Transfers of excess cash (over minimum balance targets) from the Surface Water Operating Fund to the Surface Water Capital fund.
- ◆ Annual cash from rates earmarked for rate funded capital

- ◆ Interest earned on Capital Fund balances and other miscellaneous capital resources

Debt Management – It is prudent to consider policies related to debt management as part of broader utility financial policy structure, in case the City ever chooses to use debt. Debt management policies should be evaluated and formalized including the level of acceptable outstanding debt, debt repayment, bond coverage and total debt coverage targets. Generally bond covenants require a minimum 1.25 debt coverage test, however since there are no current or forecasted bonds, this is not applicable in the current study.

9.3.3 Financial Assumptions

The financial forecast is developed from 2015 budget documents along with other key factors and assumptions to develop a complete portrayal of the utility's annual financial obligations. The following is a list of the key revenue and expense factors and assumptions used to develop the financial forecast:

- ◆ **Revenue** – The utility has two general revenue sources: revenue from charges for service (rate revenue) and miscellaneous (non-rate) revenue. In the event of a forecasted annual shortfall, rate revenue can be increased to meet the annual revenue requirement. Non-rate revenues are forecast to not escalate based on the nature of the revenues.
- ◆ **Growth** – Rate revenue is escalated based on 0.25 percent customer growth per year, which is just over half of the 0.40 percent growth rate provided in the City's *Comprehensive Plan*, and allows for more conservative financial forecasting.
- ◆ **Expenses** – O&M expense projections are based on the 2015 budget and are forecast to increase with general cost inflation of 2.50 percent, construction cost inflation of 3.26 percent, labor cost inflation of 2.87 percent and benefit cost inflation of 3.91 percent. Budget figures were used for 2015 taxes; future taxes are calculated based on forecasted revenues and prevailing tax rates. All scenarios prioritize NPDES compliance in 2016 and forecast the General Fund Reserve reimbursement to cut in half in 2016 and zero out in 2017.
- ◆ **Existing Debt** – The City's Surface Water Utility Fund currently has no outstanding debt.
- ◆ **Future Debt** – The capital funding strategy developed for this SWMP indicates no new debt issuance is required.
- ◆ **Transfer to Capital** – Any Operating Fund balance above the minimum requirement is assumed to be available to fund capital projects and is projected to be transferred to the Capital Fund each year. In order to allow a transfer of \$234,000 to the Capital Fund, the 2015 Operating Fund balance is expected to end the year below the target of 60 days of O&M expenses. With currently secured grant revenue and capital expenses, the Capital Fund balance is expected to be approximately \$13,000 at the end of 2015. The length of time it takes to replenish both the operating and capital funds to their target balances is dependent on the City's actions (i.e., rate increases) in subsequent years.

9.4 Level of Service Analysis

The City considered four scenarios in the financial analysis. Each analysis considered all funding resource options, the Utility's financial policies and targets, and current operating needs. The forecast scenarios only considered options that were compliant with current regulatory requirements. The current surface water rate is \$7.85 per Equivalent Residential Unit (ERU). Resulting rate revenue

is projected to be \$1.33 million in 2015. Total 2015 budgeted expenses for the utility are \$1.52 million, which shows that the utility is currently underfunded.

9.4.1 Level of Service Options

The financial plan developed for this SWMP identifies four scenarios. Consistent in all four scenarios are:

- ◆ The \$646,000 that was included in the 2015 adopted capital budget
- ◆ The \$302,000 Smuggler's Gulch LID project that was carried over from 2014 to 2015
- ◆ Additional O&M costs that are necessary to meet NPDES regulatory requirements
- ◆ Discontinuation of the transfer from the Surface Water Fund to the General Fund by the end of 2017
- ◆ Secured grant funding in 2015

Cash funding for the remaining costs would increase or decrease as needed for each scenario. The scenarios are briefly described below, with details found in Appendix H.

- ◆ Scenario #1 does not include any additional capital within in the forecast and assumes receiving supplemented funding from other areas of Public Works, resulting in a reduced level of service in Parks, such as limiting irrigation, discontinuing portable toilet services, and reducing landscaping services.
- ◆ Scenario #2 includes the eight highest priority capital projects, beginning in 2018, and completed in 2032 and assumes receiving supplemented funding from other areas of Public Works, resulting in a reduced level of service in Parks, such as limiting irrigation, and discontinuing portable toilet services, and reducing landscaping services.
- ◆ Scenario #3 includes the eight highest priority capital projects, beginning in 2017, and completed in 2031 and assumes no supplemental funding
- ◆ Scenario #4 includes the eight highest priority capital projects beginning in 2016 and completed in 2030 and assumes no supplemental funding

All scenarios with capital (#2, #3, and #4) also include a one-time pipe inspection and basin planning costs spread evenly over each year; these costs begin the same year as the other projects in each scenario and are to be completed by 2025 regardless of when they start.

A summary of the four scenarios is shown in Table 9-1. Further detail for each of the scenarios can be found in the following section.

TABLE 9-1: LEVEL OF SERVICE (LOS) OPTIONS

Scenario	Description
1 - Supplemented - No CIP	NPDES Compliant, 2016 Supplemented Funding
2 - Supplemented - 2018-2032 CIP	NPDES Compliant, 2016 Supplemented Funding
3 - Utility Funded - 2017-2031 CIP	NPDES Compliant
4 - Utility Funded - 2016-2030 CIP	NPDES Compliant

Operating Fund at 60 days of O&M Expenses
All scenarios prioritize NPDES compliance in 2016
No General Fund Transfer after 2017
CIP includes top 8 capital projects

9.4.2 Level of Service Results

The following tables summarize the annual revenue requirements based on the forecast of revenues, expenditures, fund balances, and fiscal policies.

Scenario #1

Scenario #1 would require supplemental funding or cuts in service equal to \$273,000 in 2016 along with rate increases of \$3.61 in 2016, \$1.15 in 2017, \$1.26 in 2018, and \$0.28 per year in 2019 and 2020. Table 9-2 shows a summary of Scenario #1.

TABLE 9-2: SCENARIO #1 – 6-YEAR FINANCIAL FORECAST

Revenue Requirement	2015	2016	2017	2018	2019	2020
Revenues						
Rate Revenues Under Existing Rates	\$ 1,334,000	\$ 1,337,284	\$ 1,340,576	\$ 1,343,877	\$ 1,347,185	\$ 1,350,502
Non-Rate Revenues	3,000	125	57	283	323	324
Total Revenues	\$ 1,337,000	\$ 1,337,409	\$ 1,340,634	\$ 1,344,159	\$ 1,347,508	\$ 1,350,825
Expenses						
Cash Operating Expenses	\$ 1,521,995	\$ 1,505,954	\$ 1,397,960	\$ 1,436,054	\$ 1,425,270	\$ 1,465,642
O&M (NPDES) Expenses	-	505,000	517,625	530,566	543,830	557,426
Rate Funded Capital	-	-	-	-	-	-
Total Expenses	\$ 1,521,995	\$ 2,010,954	\$ 1,915,585	\$ 1,966,620	\$ 1,969,100	\$ 2,023,067
Total Surplus (Deficiency)	\$ (184,995)	\$ (673,545)	\$ (574,951)	\$ (622,460)	\$ (621,591)	\$ (672,242)
Annual Rate Adjustment		46.00%	10.00%	10.00%	2.00%	2.00%
Net Cash Flow After Rate Increase	(184,995)	(67,622)	225,252	392,302	442,554	442,463
Monthly Rate per ERU	\$ 7.85	\$ 11.46	\$ 12.61	\$ 13.87	\$ 14.15	\$ 14.43

Cash Deficiency	\$ 67,622
Stormwater Fund Balance Deficiency	205,568
Additional Funding or Cuts Needed	\$ 273,189

Scenario #2

Scenario #2 would also require supplemental funding or cuts of \$273,000 in 2016 along with rate increases of \$3.61 in 2016, \$2.18 in 2017, \$2.59 in 2018, \$3.08 in 2019, and \$3.67 in 2020. Table 9-3 shows a summary of Scenario #2.

TABLE 9-3: SCENARIO #2 – 6-YEAR FINANCIAL FORECAST

Revenue Requirement	2015	2016	2017	2018	2019	2020
Revenues						
Rate Revenues Under Existing Rates	\$ 1,334,000	\$ 1,337,284	\$ 1,340,576	\$ 1,343,877	\$ 1,347,185	\$ 1,350,502
Non-Rate Revenues	3,000	125	57	315	323	324
Total Revenues	\$ 1,337,000	\$ 1,337,409	\$ 1,340,634	\$ 1,344,191	\$ 1,347,508	\$ 1,350,825
Expenses						
Cash Operating Expenses	\$ 1,521,995	\$ 1,505,954	\$ 1,397,960	\$ 1,436,054	\$ 1,425,270	\$ 1,465,642
O&M (NPDES) Expenses	-	505,000	517,625	530,566	543,830	557,426
Rate Funded Capital	-	-	140,000	750,000	1,250,000	1,750,000
Total Expenses	\$ 1,521,995	\$ 2,010,954	\$ 2,055,585	\$ 2,716,620	\$ 3,219,100	\$ 3,773,067
Total Surplus (Deficiency)	\$ (184,995)	\$ (673,545)	\$ (714,951)	\$ (1,372,428)	\$ (1,871,591)	\$ (2,422,242)
Annual Rate Adjustment		46.00%	19.00%	19.00%	19.00%	19.00%
Net Cash Flow After Rate Increase	(184,995)	(67,622)	258,762	40,649	66,236	142,196
Monthly Rate per ERU	\$ 7.85	\$ 11.46	\$ 13.64	\$ 16.23	\$ 19.31	\$ 22.98

Cash Deficiency	\$ 67,622
Stormwater Fund Balance Deficiency	205,568
Additional Funding or Cuts Needed	\$ 273,189

Scenario #3

Scenario #3 would require rate increases of \$6.99 in 2016, \$2.45 in 2017, \$1.90 in 2018, \$2.01 in 2019, and \$2.23 in 2020. Table 9-4 shows a summary of Scenario #3.

TABLE 9-4: SCENARIO #3 – 6-YEAR FINANCIAL FORECAST

Revenue Requirement	2015	2016	2017	2018	2019	2020
Revenues						
Rate Revenues Under Existing Rates	\$ 1,334,000	\$ 1,337,284	\$ 1,340,576	\$ 1,343,877	\$ 1,347,185	\$ 1,350,502
Non-Rate Revenues	3,000	125	331	315	323	324
Total Revenues	\$ 1,337,000	\$ 1,337,409	\$ 1,340,907	\$ 1,344,191	\$ 1,347,508	\$ 1,350,825
Expenses						
Cash Operating Expenses	\$ 1,521,995	\$ 1,505,954	\$ 1,397,960	\$ 1,436,054	\$ 1,425,270	\$ 1,466,490
O&M (NPDES) Expenses	-	505,000	517,625	530,566	543,830	557,426
Rate Funded Capital	-	-	1,000,000	1,250,000	1,500,000	1,750,000
Total Expenses	\$ 1,521,995	\$ 2,010,954	\$ 2,915,585	\$ 3,216,620	\$ 3,469,100	\$ 3,773,916
Total Surplus (Deficiency)	\$ (184,995)	\$ (673,545)	\$ (1,574,678)	\$ (1,872,428)	\$ (2,121,591)	\$ (2,423,091)
Annual Rate Adjustment		89.00%	16.50%	11.00%	10.50%	10.50%
Net Cash Flow After Rate Increase	(184,995)	498,785	12,326	39,092	135,171	216,447
Monthly Rate per ERU	\$ 7.85	\$ 14.84	\$ 17.28	\$ 19.19	\$ 21.20	\$ 23.43

Scenario #4

Scenario #4 would require rate increases of \$10.28 in 2016, \$1.63 in 2017, \$1.68 in 2018, \$1.72 in 2019, and \$1.27 in 2020. Table 9-5 shows a summary of Scenario #4.

TABLE 9-5: SCENARIO #4 – 6-YEAR FINANCIAL FORECAST

Revenue Requirement	2015	2016	2017	2018	2019	2020
Revenues						
Rate Revenues Under Existing Rates	\$ 1,334,000	\$ 1,337,284	\$ 1,340,576	\$ 1,343,877	\$ 1,347,185	\$ 1,350,502
Non-Rate Revenues	3,000	125	331	315	323	324
Total Revenues	\$ 1,337,000	\$ 1,337,409	\$ 1,340,907	\$ 1,344,191	\$ 1,347,508	\$ 1,350,825
Expenses						
Cash Operating Expenses	\$ 1,521,995	\$ 1,505,954	\$ 1,397,960	\$ 1,436,054	\$ 1,426,098	\$ 1,466,490
O&M (NPDES) Expenses	-	505,000	517,625	530,566	543,830	557,426
Rate Funded Capital	-	750,000	1,250,000	1,500,000	1,750,000	2,000,000
Total Expenses	\$ 1,521,995	\$ 2,760,954	\$ 3,165,585	\$ 3,466,620	\$ 3,719,928	\$ 4,023,916
Total Surplus (Deficiency)	\$ (184,995)	\$ (1,423,545)	\$ (1,824,678)	\$ (2,122,428)	\$ (2,372,419)	\$ (2,673,091)
Annual Rate Adjustment		131.00%	9.00%	8.50%	8.00%	5.50%
Net Cash Flow After Rate Increase	(184,995)	302,020	179,660	170,148	215,817	137,384
Monthly Rate per ERU	\$ 7.85	\$ 18.13	\$ 19.77	\$ 21.45	\$ 23.16	\$ 24.44

9.4.3 Summary

All four scenarios were considered. Staff recommends scenario #3 because it is NPDES compliant, it is projected to be fully utility-funded, and initial rate increases are projected to be lower because no capital is planned for 2016.

9.5 Recommended Funding Plan (Scenario #3)

The Utility prioritized O&M and permit compliance over capital projects. As a result, capital projects other than those in the 2015 budget are scheduled to begin in 2017. This meets the City goals of issuing no debt and retaining a reasonable rate. The eight highest priority capital projects, as well as the additional capital that is included in all scenarios that include capital (which are described in more detail in section 9.4.1), are forecast to be completed in a 15 year window beginning in 2017.

The eight highest priority capital project costs in the Brown & Caldwell planning level cost analysis (in Appendix E) as well as the 2015 budgeted capital and the additional capital that is included in all scenarios that include capital, are provided in 2015 dollars and summarized in Table 9-6. Table 9-7 compares these 2015 costs to inflation adjusted costs in the expected year of construction. The inflation rate was assumed to be 3.26% per year in the financial analysis.

TABLE 9-6: SCENARIO #3 - CIP COST SUMMARY

CIP Rank No.	Funding Year Modeled	Project Name	Total CIP Cost 2015\$
Not ranked	2015	Lighthouse Park Tidegate Stormwater Repairs	\$50,000
Not ranked	2015	61st Culvert Replacement	\$262,500
Not ranked	2015	Naketa Beach Storm Pipe Repairs & Slope Rehab	\$333,500
Not ranked	2015	Smuggler's Gulch LID	\$302,384
Not ranked	2017	Decant facility	\$320,000
Not ranked	2017-2025	Pipe Inspections	\$629,640
Not ranked	2017-2025	Basin Planning	\$1,561,800
1	2020	Chennault Beach Drive Drainage Improvements	\$3,811,000
2	2024	Mukilteo Lane Drainage Improvements	\$6,591,000
3	2026	84th Street SW (West) Storm Drainage Improvements	\$1,240,000
4 and 5	2026	64th Place W Street Drainage Improvements	\$1,202,000
	2026	66th Place W Street Drainage Improvements	\$1,425,000
6	2029	Central Drive Storm Drainage Improvements for Big Gulch Basin	\$5,267,000
7	2030	62nd Place W/Canyon Drive Storm Drainage Improvements	\$2,852,000
8	2031	10th Street and Loveland Avenue Storm Drainage Improvements	\$794,000

TABLE 9-7: SCENARIO #3 CIP

Year	2015\$	Inflated
2015	\$ 948,384	\$ 948,384
2016	-	-
2017	563,493	600,870
2018	243,493	268,117
2019	243,493	276,866
2020	4,054,493	4,760,638
Subtotal	\$ 6,053,357	\$ 6,854,874
2021 - 2031	20,588,467	28,753,908
Total	\$ 26,641,824	\$ 35,608,782

9.5.1 Capital Financing Strategy

Based on information provided by the City, the Utility began 2015 with \$544,000 in the Operating Fund. Additional funds beyond the Operating Fund target of sixty days of O&M expenses are transferred to the Capital Fund in the financial forecast and range from \$28,000 in 2017 up to \$3.52 million in 2034, based on Scenario #3.

The cash resources described above are forecasted to fund 100 percent of the 2015 budgeted capital, the additional capital that is included in all scenarios that include capital, and the eight highest priority capital projects in the financial forecast. Table 9-8 presents the corresponding financing strategy for Scenario #3.

TABLE 9-8: SCENARIO #3 - CAPITAL FUNDING STRATEGY

Year	Capital Expenditures 2015\$	Capital Expenditures Inflated	Secured Grant Funding	Cash Funding	Total Financial Resources
2015	\$ 948,384	\$ 948,384	\$ 727,600	\$ 220,784	\$ 948,384
2016	-	-	-	-	-
2017	563,493	600,870	-	600,870	600,870
2018	243,493	268,117	-	268,117	268,117
2019	243,493	276,866	-	276,866	276,866
2020	4,054,493	4,760,638	-	4,760,638	4,760,638
Subtotal	\$ 6,053,357	\$ 6,854,874	\$ 727,600	\$ 6,127,274	\$ 6,854,874
2021 - 2031	20,588,467	28,753,908	-	28,753,908	28,753,908
Total	\$ 26,641,824	\$ 35,608,782	\$ 727,600	\$ 34,881,182	\$ 35,608,782

The capital funding plan identifies 2.04 percent grant funding for capital projects based on already secured grant funding. The remaining capital costs are projected to be covered by cash funding. This type of planning looks at average growth over the financial planning period and does not take into consideration the current economic conditions, which can have a negative impact on annual growth. It is assumed that if growth is not occurring at the planned rate, the timing of capital projects would be adjusted accordingly.

9.5.2 Utility Funds and Reserves

Table 9-9 shows a summary of the projected Operating Fund and Capital Fund ending balances through 2020 based on the rate forecasts presented above in Table 9-4. The Operating Fund has a minimum target balance of 60 days of O&M expenses and remains above that throughout the forecast. The Capital Fund target balance is set at \$300,000 per year. The ending Capital Fund balance is below target in 2015, but escalates back above target levels by the end of 2016.

TABLE 9-9: SCENARIO #3 - ENDING CASH BALANCE SUMMARY

Ending Fund Balances	2015	2016	2017	2018	2019	2020
Operating Fund	\$ 125,000	\$ 330,568	\$ 314,891	\$ 323,280	\$ 323,688	\$ 332,699
Capital Fund	12,872	306,102	733,542	1,746,861	3,106,505	306,410
Total	\$ 137,872	\$ 636,670	\$ 1,048,433	\$ 2,070,141	\$ 3,430,193	\$ 639,108
<i>Combined Minimum Target Balance</i>	<i>425,000</i>	<i>630,568</i>	<i>614,891</i>	<i>623,280</i>	<i>623,688</i>	<i>632,699</i>

9.6 Current and Projected Rates

9.6.1 Current Rates

The City's current rate is based on impervious surface area and is charged per equivalent residential unit (ERU). One ERU is equal to 2,500 sq. ft. of impervious surface area. All single family residences are assigned one ERU, regardless of actual impervious surface area. Other developed property is charged based on its measured impervious area, expressed as a number of ERUs. Table 9-10 shows the existing rate structure.

TABLE 9-10: 2015 EXISTING RATE STRUCTURE

Monthly Rate	
Per ERU	\$ 7.85

9.6.2 Projected Rates

The analysis for this SWMP shows the need for rate increases of \$6.99 in 2016, \$2.45 in 2017, \$1.90 in 2018, \$2.01 in 2019, and \$2.23 in 2020 based on CIP Scenario #3.

Table 9-11 shows the proposed rates for the 6-year planning period for Scenario #3. Table 9-12 shows monthly residential bill comparisons for Scenario #3.

TABLE 9-11: SCENARIO #3 – 6-YEAR PROPOSED RATES

Monthly Rates	Existing	2016	2017	2018	2019	2020
Per ERU	\$ 7.85	\$ 14.84	\$ 17.28	\$ 19.19	\$ 21.20	\$ 23.43

TABLE 9-12: SCENARIO #3 – MONTHLY BILL COMPARISONS

Residential	Existing	2016	2017	2018	2019	2020
Monthly Bill	\$ 7.85	\$ 14.84	\$ 17.28	\$ 19.19	\$ 21.20	\$ 23.43
\$ Difference		\$ 6.99	\$ 2.45	\$ 1.90	\$ 2.01	\$ 2.23
Rate Increase		89.00%	16.50%	11.00%	10.50%	10.50%

Note: Assumes 1 ERU

9.7 Affordability

The Department of Health and the Department of Commerce Public Works Board use an affordability index to prioritize low-cost loan awards depending on whether rates exceed 2.0 percent of the median household income for the service area. The average median household income for Mukilteo was \$93,717 in 2009 – 2013 according to the U.S. Census Bureau. The 2013 figures are escalated based on the assumed 2.50 percent general cost inflation to show the median household income in future years. Table 9-13 presents the City's rates with the projected rate increases for the forecast period, tested against the 2.0 percent monthly affordability threshold.

TABLE 9-13: SCENARIO #3 – AFFORDABILITY TEST

Year	Inflation	Median HH Income	2% Monthly Threshold	Projected Monthly Bill	Total Utility Monthly Bill [a]	% of Median HH Income
2013		\$ 93,717	\$ 156.20			
2014	2.50%	96,060	160.10			
2015	2.50%	98,461	164.10	\$ 7.85	\$ 102.93	1.25%
2016	2.50%	100,923	168.20	14.84	113.70	1.35%
2017	2.50%	103,446	172.41	17.28	118.62	1.38%
2018	2.50%	106,032	176.72	19.19	123.06	1.39%
2019	2.50%	108,683	181.14	21.20	127.67	1.41%
2020	2.50%	111,400	185.67	23.43	132.56	1.43%

[a] Includes water (based on 6,600 gallon average monthly usage) and wastewater rates for Mukilteo Water & Wastewater District (actual for 2015-16, then escalated with inflation)

Applying the 2.0 percent test, the City's rates are forecasted to remain within the indicated affordability range through 2020 for all scenarios.

Additionally, according to Mukilteo Municipal Code 13.16.030D, there is a 50% discount available for low-income seniors and low-income disabled property owners.

9.8 Conclusion

The City considered four scenarios in the financial analysis. Each analysis considered all funding resource options, the Utility's financial policies and targets, and current operating needs. Scenarios #2 through #4 included the current capital project list; while Scenario #1 considered no capital projects. A funding gap was identified in all scenarios under the current rate structure. Rate increases under Scenarios #1 and #2 resulted in lower level of service in other areas for Public Works, including the potential of some park closures to meet the funding gap, even with increased rates. Scenario #4 showed a rate increase of nearly \$4 more than Scenario #3 in 2016 in order to start the capital projects one year earlier.

The results of this analysis indicate the need for rate increases to fund ongoing operating needs and CIP. Implementation of the proposed rate increases should provide for continued financial viability while maintaining generally affordable rates.

Scenario #3 is recommended because it is projected to be fully utility-funded, and rate increases are projected to be lower since no capital is planned for 2016. It is imperative that the City revisit the proposed rates every 2 to 3 years to ensure that the rate projections developed remain adequate. Any significant changes should be incorporated into the financial plan and future rates should be adjusted as needed.

9.9 Staff Recommendations

- 1) Adopt rate structure presented under Scenario #3 of the Financial Analysis
- 2) Revise the current budget line items within Surface Water to include:
 - a) Surface Water Capital Project Fund
 - b) Operating Fund 60-day Reserve
 - c) Capital Fund Reserve (\$300,000)
- 3) Review rates and current operational and capital needs annually
- 4) Conduct new financial analysis in 2020 to assure projected rates are in line with Utility expenses

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