CITY OF STANWOOD

2015 Stormwater Comprehensive Plan

PACE nhc
An Engineering Services Company

CITY OF STANWOOD

2015 STORMWATER COMPREHENSIVE PLAN

City of Stanwood
Public Works Department
10220 270th Street NW
Stanwood, WA 98292
360-629-2181

Mayor
Leonard Kelley

City Manager
Deborah Knight

Public Works Director
Kevin Hushagen

Community Development Director
Ryan Larsen

Prepared By:

PACE Engineers, Inc.
11255 Kirkland Way, Suite 300
Kirkland, Washington 98033-6715
425.827.2014

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ACKNOWLEDGEMENTS

City of Stanwood, Washington

Leonard Kelley, Mayor

Rob Johnson, City Council Position 1
Arne Wennerberg, City Council Position 2
Rick Randall, City Council Position 3
Matt McCune, City Council Position 4
Larry Sather, City Council Position 5
Conrad Ryer, City Council Position 6
Dottie Gorsuch, City Council Position 7

Carly Ruacho, City Planner
Lisa Sokolik, Public Works Administrative Assistant
Trevor Harrison, Operation and Maintenance Lead

PACE Engineers, Inc.
Joe Simmler, PhD, Senior Principal Engineer
Kenneth Nilsen, PE, Vice President
Jessica Christofferson, EIT, Stormwater Engineer
John Forba, PE, Project Engineer
Josh Miller, GIS Analyst
Brenda Elder, GIS Analyst
April Cook, Project Administrator

Northwest Hydraulic Consultants
Derek Stuart, PE, Project Engineer

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CERTIFICATE OF ENGINEER

2015 Stormwater Comprehensive Plan
City of Stanwood, Washington

This report has been prepared by, or under the direction of, the following registered professional engineers, licensed in accordance with the laws of the State of Washington to practice in the State of Washington:

Kenneth H. Nilsen, PE
Vice President
PACE Engineers, Inc.

Joseph Simmler, PhD
Senior Principal Engineer
PACE Engineers, Inc.

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PREFACE

The City of Stanwood (City) is faced with a number of significant stormwater management (SWM) challenges, including an undersized, aging infrastructure and numerous regional and local flooding problems. To assist the City in addressing these challenges, PACE Engineers, Inc., (PACE) has been retained to review the City's existing Stormwater Management Program (SWMP) and develop a Stormwater Comprehensive Plan (SCP). The purpose of this SCP is to provide the City with a planning document that anticipates the need for compliance with various local, state, and federal stormwater regulatory requirements, most specifically the National Pollutant Discharge Elimination System (NPDES) Western Washington Phase II Permit (Permit), and allows the City to plan for, add, upgrade, and/or replace critical parts of the City's system of natural and manmade stormwater facilities. One of the primary products of this stormwater planning will be the development of an updated, prioritized list of stormwater Capital Improvement Program (CIP) projects that reduces flooding and property damage throughout the City.

This SCP evaluates the City's existing SWMP, including facility infrastructure and programmatic activities such as annual maintenance, and provides recommendations to improve the capacity of the City's stormwater collection, conveyance, and disposal/discharge system. It also includes an implementation plan with annual costs to satisfy the future requirements of the National Pollutant Discharge Elimination System (NPDES) Western Washington Phase II Permit (Permit) and initiate the City's CIP projects. The City is not currently under an NPDES Permit; however, it is anticipating the need for compliance over the next several years. It is using compliance with the Permit as a measure of the adequacy and effectiveness of its existing Stormwater Management Program and supporting capital facilities.

The resulting SCP defines the City's SWMP needs by setting priorities and identifying corresponding stormwater related activities, staffing, equipment, capital improvements, and annual revenue needs, including Stormwater Utility fees. A long-term implementation plan, in the form of annualized budgets for staffing, capital projects, and future regulatory compliance activities has been developed to help guide the process.

This stormwater planning process is being complimented by a corresponding financial review and Drainage Utility rate study that is being conducted by another consultant. This stormwater planning process and resulting infrastructure management plan is part of a citywide land use and infrastructure planning process. The broader citywide process also involves water, sewer, and transportation infrastructure planning and is part of a unified effort to formulate an updated Growth Management Plan for the City by the end of the year.

This final report summarizes the technical information and memoranda that were prepared during the SWMP planning process. Technical information, geodatabase mapping, and supporting studies and analyses are presented in the following technical Appendices:

- Appendix A – Supporting Technical Documents
  - A.1: City of Stanwood SWMP Mission and Vision
  - A.2: City of Stanwood SWMP Policies
  - A.3: 2012 List of Detention Facilities
  - A.4: WRIA 5 Ecology Publication #11-11-010, August 2012
  - A.5: Memorandum of Understanding between City of Stanwood and Diking District 7
  - A.6: Snohomish County R/D Pond Maintenance Agreement
  - A.7: Memorandum of Understanding between City of Stanwood and Stillaguamish Tribe for Watershed Improvements, May 2013
  - A.8: NHC Technical Memorandum to PACE Engineers, Inc., "Modeling Needs Recommendations," March 2014
  - A.9: SWM Data List Request to City, December 2013
  - A.10: SWM Questionnaire, March 2014
  - A.11: SWM Public Survey, January 2014
  - A.12: Public Survey Selection of Mailed Responses, January 2014
  - A.13: Public Survey Electronic Forms
  - A.14: Public Survey Response Compilation
  - A.15: 2004 Budget Summary, Drainage Fund
  - A.16: Drainage Concerns Summary
- Appendix B – SWMP and NPDES Permit II Regulatory Gap Analysis Results

To assist in the reading of the document, *lists of abbreviations and definitions* have been provided in the front of the document.

This project was funded and managed through the City's Drainage Utility, and is annually administered by the Public Works Department. Input and direction were also periodically received from the City's Public Works Committee.

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A.5: Memorandum of Understanding between City of Stanwood and Diking District 7
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A.12: Public Survey Selection of Mailed Responses, January 2014
A.13: Public Survey Electronic Forms
A.14: Public Survey Response Compilation
A.15: 2004 Budget Summary, Drainage Fund
A.16: Drainage Concerns Summary

APPENDIX B – SWM PROGRAM AND NPDES PERMIT II REGULATORY GAP ANALYSIS RESULTS

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ACRONYMS AND ABBREVIATIONS

AKART	All Known, Available, and Reasonable Methods of Prevention, Control, and Treatment
BMP	Best Management Practices
CESCL	Certified Erosion and Sediment Control Lead
CESCP	Contractor's Erosion and Sediment Control Plan
CFHMP	Comprehensive Flood Hazard Management Plan
CFR	Code of Federal Regulations
CIP	Capital Improvement Program
City	City of Stanwood
County	Snohomish County
CWA	Federal Clean Water Act
CWD	Stillaguamish River Clean Water District
DI	Ductile Iron
Ecology	Department of Ecology
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESC	Erosion and Sediment Control
FEMA	Federal Emergency Management Agency
FC	Fecal Coliform
FTE	Full Time Equivalents
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information System
GMA	Growth Management Act
HPA	Hydraulic Project Approval
IDDE	Illicit Discharge Detection and Elimination
ILA	Interlocal Agreement
LID	Low Impact Development
Manual	Stormwater Management Manual for Western Washington
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NEPA	National Environmental Protection Act
NOI	Notice of Intent
OFM	Office of Financial Management
PACE	PACE Engineers, Inc.
Partnership	Puget Sound Partnership
Permit	NPDES Phase II Municipal Stormwater Permit for Western Washington
RCW	Revised Code of Washington
SCP	Stormwater Comprehensive Plan

SMC	Stanwood Municipal Code
SMMWW	Department of Ecology's 2005 Stormwater Management Manual for Western Washington
SWM	Stormwater Management
SWMP	Stormwater Management Program
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
TMDL	Total Maximum Daily Load
UGA	Urban Growth Area
UIC	Underground Injection Control (Rule)
USDA	United States Department of Agriculture
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WRIA	Water Resource Inventory Area 5

DEFINITIONS[1]

Annual Flood

The highest peak discharge on average which can be expected in any given year.

Applicable BMPs

Applicable BMPs are those source control BMPs that are expected to be required by local governments at new development and redevelopment sites. Applicable BMPs will also be required if they are incorporated into NPDES permits, or if they are included by local governments in a stormwater program for existing facilities.

As-built Drawings

Engineering plans which have been revised to reflect all changes to the plans which occurred during construction.

Bankfill Discharge

A flow condition where stream flow completely fills the stream channel up to the top of the bank. In undisturbed watersheds, the discharge conditions occur on average every 1.5 to 2 years and controls the shape and form of natural channels.

Base Flood

A flood having a one percent chance of being equaled or exceeded in any given year. This is also referred to as the 100-year flood.

Base Flood Elevation

The water surface elevation of the base flood. It shall be referenced to the National Geodetic Vertical Datum of 1929 (NGVD).

Best Management Practice (BMP)

The schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to waters of Washington State.

Biofilter

A designed treatment facility using a combined soil and vegetation system for filtration, infiltration, adsorption, and biological uptake of pollutants in stormwater when runoff flows over and through the facility. Vegetation growing in these facilities acts as both a physical filter which causes gravity settling of particulates by regulating velocity of flow, and also as a biological sink when direct uptake of dissolved pollutants occurs. The former mechanism is probably the most important in western Washington where the period of major runoff coincides with the period of lowest biological activity.

[1] The majority of these definitions are sourced from the Washington Department of Ecology (Ecology) Western Washington Phase II Municipal Stormwater Permit (Phase II Permit). Definitions not provided from the Phase II Permit were taken from other sources, including Ecology's Stormwater Management Manual for Western Washington and Environmental Protection Agency's (EPA) NPDES website glossary.

Bioswale

A shallow drainage conveyance with relatively gentle side slopes, generally manmade that provides water quality treatment, and is usually vegetated.

Catch Basin

A drainage structure which collects water. May be either a structure where water enters from the side or through a grate.

Conveyance System

The drainage facilities, both natural and manmade, which collect and carry surface and stormwater flow. Conveyance systems can include one or more of the following: gutters, drainage inlets, pipes, catch basins, manholes, channels, swales, ditches, small drainage courses, streams, and rivers.

Critical Areas

At a minimum, areas which include wetlands, areas with a critical recharging effect on aquifers used for potable water, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas, including unstable slopes, and associated areas and ecosystems.

Critical Drainage Area

An area with such severe flooding, water quality, drainage and/or erosion/sedimentation conditions that the area has been formally adopted as a Critical Drainage Area by rule under the procedures specified in an ordinance.

Detention

The release of stormwater runoff from the site at a slower rate than it is collected by the stormwater facility system, the difference being held in temporary storage and released slowly over time as the flow decreases.

Dry Weather Flow

The combination of groundwater seepage and allowed non-stormwater flows found in storm sewers during dry weather. Also that flow in streams during the dry season.

Floodway

The channel of the river or stream and those portions of the adjoining floodplains that are reasonably required to carry and discharge the base flood flow. The portions of the adjoining floodplains which are considered to be "reasonably required," as defined by flood hazard regulations.

Groundwater

Water in a saturated zone or stratum beneath the land surface or a surface water body.

Impervious

A surface which cannot be easily penetrated. For instance, rain does not readily penetrate paved surfaces.

Infiltration

Means the downward movement of water from the surface through the subsoil.

Low Impact Development (LID)

Low Impact Development (LID) is a stormwater management approach with a basic principle that is modeled after nature: manage rainfall at the source using uniformly distributed, decentralized

micro-scale controls. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. Techniques are based on the premise that stormwater management should not be seen as stormwater disposal.

Maintenance

Activities conducted to extend the life and ensure proper operation of existing facilities. Maintenance should not expand the use or capacity of a facility beyond the existing or designed use and results in no significant adverse hydrologic impact.

Maintenance Standard

Describes the type and frequency of cleaning, repair, or other maintenance that is required to sustain the design functions of a given facility.

National Pollutant Discharge Elimination System (NPDES)

The national program for issuing, modifying, revoking, reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements under sections 307, 402, 318, and 405 of the Federal Clean Water Act for the discharge of pollutants to surface waters of the state from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington Department of Ecology.

Overflow

A pipeline or conduit device, together with an outlet pipe, that provides for the discharge of portions of combined sewer flows into receiving waters, usually associated with elevated flows or other points of disposal, after a regular device has allowed the portion of the flow which can be handled by interceptor sewer lines and pumping and treatment facilities to be carried by and to such water pollution control structures.

Permit

NPDES Western Washington Phase II Municipal Stormwater Permit, issued by the Department of Ecology on January 17, 2007 and modified June 17, 2009. A new Permit was issued on August 1, 2013.

Pollutant

A waste material that pollutes wind, water, or soil. A non-stormwater discharge that enters the stormwater collection and conveyance system.

Receiving Waters

Any water body receiving stormwater runoff, including surface water, groundwater, and the stormwater collection and conveyance system.

Retention/Detention Facility (R/D)

A type of drainage facility designed either to hold water for a considerable length of time and then release it by evaporation, plant transpiration, and/or infiltration into the ground; or to hold surface and stormwater runoff for a short period of time and then release it to the surface and stormwater management system.

Runoff

Water originating from rainfall and other precipitation that is found in drainage facilities, rivers, streams, springs, seeps, ponds, lakes, and wetlands, as well as shallow groundwater. As applied in this

manual, it also means the portion of rainfall or other precipitation that becomes surface flow and interflow.

Stormwater

That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Underground Injection Control Wells

UIC wells are manmade structures used to discharge fluids into the subsurface. Examples include drywells, infiltration trenches with perforated pipe, and any structure deeper than the widest surface dimension. The majority of UIC wells in Washington are used to manage stormwater (i.e., drywells) and sanitary waste (large on-site systems), return water to the ground, and help clean up/dispose of contaminated sites. The potential for groundwater contamination from injection wells depends upon well construction and location; quality of the fluids injected; and the geographic and hydrologic settings in which the injection occurs.

Water Quality

The chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose.

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CHAPTER 1
INTRODUCTION

1.1 BACKGROUND

1.1.1 Location of Study Area

The City of Stanwood is located in Snohomish County, Washington, about 25 miles north of the City of Seattle. It is also just north of the City of Marysville and south of the City of Mount Vernon, with Skagit Bay and Camano Island of Puget Sound located to the west. I-5, located just to the east, is the region's major north-south Interstate Highway system. The Stillaguamish River runs south of the City, tangentially in several places. Figure 1-1 presents a vicinity map of the City showing its general location in relationship to Interstate 5, the Stillaguamish River, and Puget Sound.

1.1.2 City's Drainage Utility: Its Origin and Purpose

Due to its location near the point of discharge of the Stillaguamish River into Puget Sound, the City has had a long history of both local and regional flooding problems. In 2006, the City of Stanwood established the citywide Drainage Utility (Ord. 1189 § 2, 2006) to support the growing financial needs of the City's aging drainage system and to help create an effective annual stormwater capital program. From its conception, the purpose of the City's Drainage Utility has been:

- To protect life and property from storm, river, flood, and excess surface waters.
- To protect water quality by preventing siltation, contamination, and erosion of waterways.
- To protect local waterways, such as Irvine Slough.
- To assure compliance with federal and state stormwater management and water quality requirements.
- To increase public education and citizen involvement.
- To encourage the preservation and enhancement of natural drainage systems that includes wetlands, rivers, and streams within the City, as supported by a system of levees, sloughs, and pump stations.
- To continue to be an active participant in regional water resource, habitat, and flood management along with the Stillaguamish Tribe, Snohomish County, local diking drainage districts, farmers, and property owners.

Mission: *The Mission of the City of Stanwood's Drainage Utility is to develop and maintain a comprehensive stormwater infrastructure management program to protect property, health, and safety; to enhance quality of life; to preserve and improve the environment for the benefit of the public; and to be responsive and sensitive to the needs of residents, property owners, and public partners.*

To effectively address its stormwater needs, the City's Drainage Utility actively manages and maintains its existing system of drainage infrastructure and strives to reduce flooding, enhance water quality, and provide planning and regional coordination for compliance with various local and regional regulatory requirements. The goals, objectives, and policies of the City's Drainage Utility are presented in Appendices A-1 and A-2.

1.1.3 Purpose of This Study

As an active and growing community, with significant areas lying adjacent to and within the Stillaguamish and Skagit River floodplains, the City is threatened with an enhanced risk of flooding on an annual basis and, as a result, is faced with numerous drainage infrastructure needs. Its major challenges include providing for public safety and protecting public and private properties by reducing local flooding, meeting regulatory requirements, and developing and prioritizing limited local resources.

This Stormwater Comprehensive Plan (SCP) defines the Utility's capital needs, addresses the requirements of a future NPDES Permit, and provides for annual maintenance and water quality protection, along with other local and regional Stormwater Management Program (SWMP) initiatives.

The City is conducting this stormwater planning process to address these challenges by developing an annual capital facilities program and preparing itself for a future National Pollutant Discharge Elimination System (NPDES) Permit by developing a plan to upgrade and expand its existing Stormwater Management Program (SWMP). Following these objectives, it is the intent of this Stormwater Comprehensive Plan (SCP) to:

- Define the capacity and deficiencies of the City's existing stormwater system.
- Design needed capital improvement projects and estimate their costs.
- Enhance the City's SWMP to address the requirements of a future NPDES Permit.
- Review and update associated codes, policies, and interlocal agreements.
- Identify the amount and types of staffing and financial resources needed, both annually and over the next ten years, to ensure an adequate level of runoff control is achieved throughout the City.

1.1.4 Structure and Content of the City's Updated Stormwater Comprehensive Plan

The structure, format, and content of this updated SCP has been developed to match the requirements of a future federal NPDES Western Washington Phase II Permit (Permit), as issued by the Washington State Department of Ecology. In addition to identifying the capital needs of the City's stormwater system, a portion of this study has focused on documenting the activities, costs, and staffing of the City's existing SWMP and comparing them to the regulatory requirements of a new Permit. This "regulatory gap analysis" will become the core of the City's new SWMP because it contains all of the elements necessary for operating an effective SWMP including: public education and involvement, development review, construction inspection and enforcement, adoption of new updated stormwater

design standards (in the form of the Department of Ecology 2012 Stormwater Management Manual for Western Washington), illicit discharge detection and elimination, and an annual maintenance program, using the latest methodologies/frequencies and based on a thorough and complete inventory of the City's stormwater facilities.

The City's new Stormwater Management Program also includes activities associated with preserving and protecting the functions and qualities of its natural drainage system (streams, wetlands, water quality, and habitat) and retrofitting existing facilities by taking a watershed-based approach for restoration and enhancement.

This study concludes with a presentation of annual costs and a discussion of funding strategies and different levels of service that will become the basis for the proposed implementation plan of the City's new updated SCP. The resulting SCP will allow the City to plan for and begin working towards developing an effective annual Capital Improvement Program (CIP) and establishing an equally effective SWMP, allowing compliance with a future state-mandated Permit.

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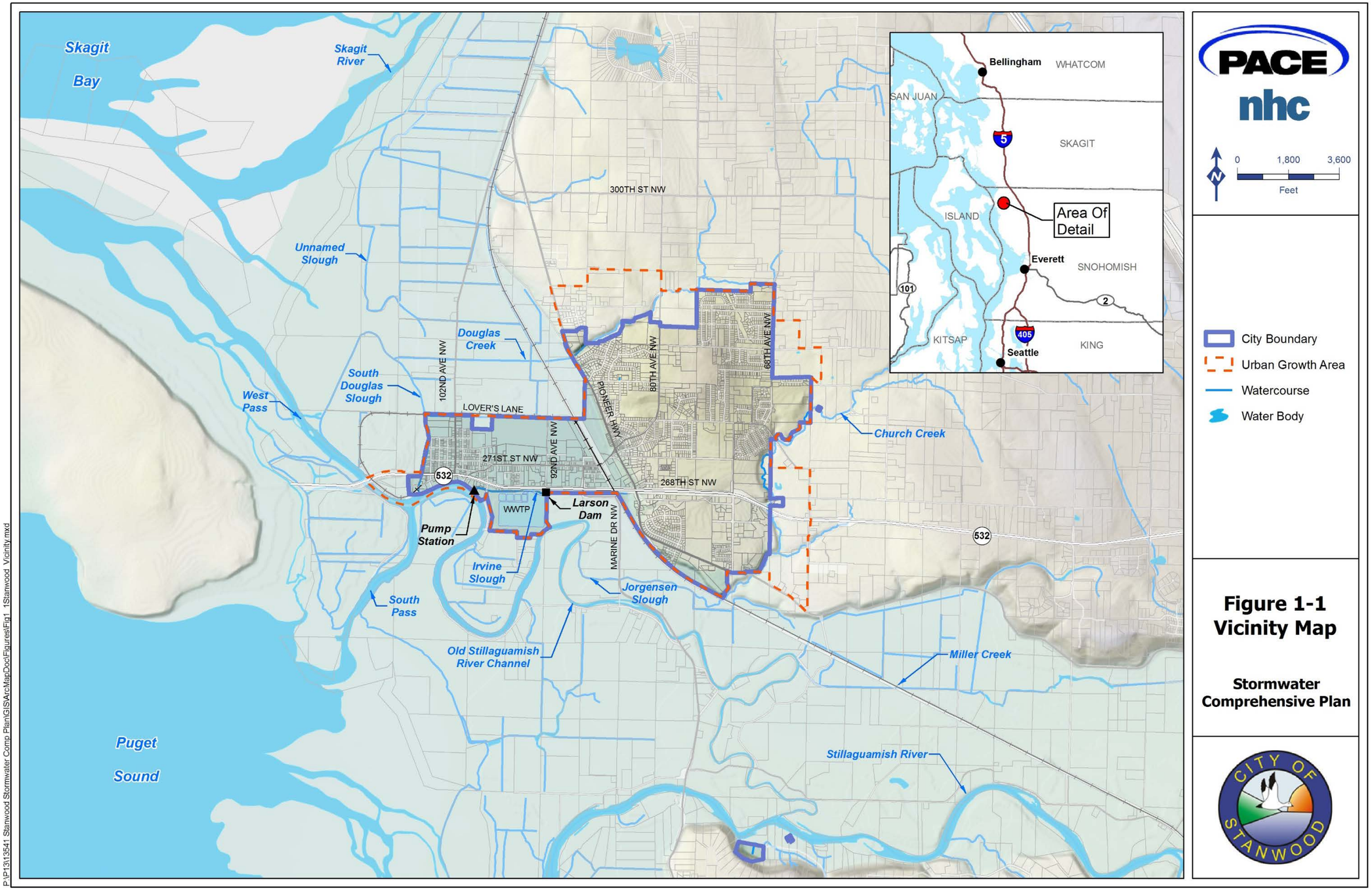

Figure 1-1
Vicinity Map

Stormwater Comprehensive Plan

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1.2 OVERVIEW OF THE STORMWATER COMPREHENSIVE PLAN DEVELOPMENT PROCESS

1.2.1 Introduction to the Stormwater Comprehensive Plan Development Process

Consistent with the above goals and objectives, this SCP will update the priorities of the Drainage Utility and develop an annual SWMP that establishes an updated, prioritized CIP and a corresponding annual programmatic funding and implementation plan.

The Drainage Utility will use this SCP to annually develop, fund, and implement an effective annual SWMP that plans for and satisfies future stormwater-related requirements, reduces localized flooding, and addresses local water quality and regional drainage objectives.

1.2.2 Goals and Objectives of the Stormwater Planning Process

The goals of this SCP development process are to develop an updated SWMP that:

1. Supports the Growth Management Act (GMA) planning process by providing the water quality, habitat, and stormwater infrastructure program elements.
2. Provides a plan for drainage infrastructure to support future growth and economic development.
3. Assesses the current level of services being provided by the Utility and recommends activities for an improved SWMP, as documented in an updated SCP.
4. Develops a comprehensive stormwater CIP list for short- and long-term implementation that addresses the City's stormwater conveyance objectives, as well as its water quality challenges.
5. Develops an effective financial plan that identifies and ensures adequate levels of long-term funding to address both capital and programmatic needs.

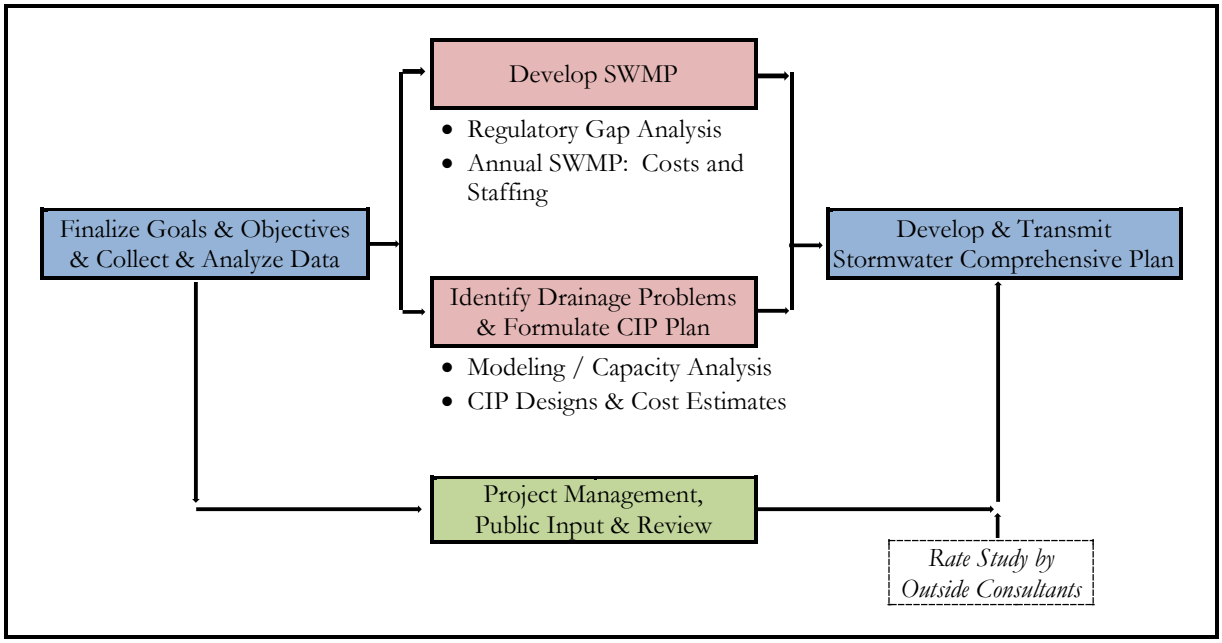
1.2.3 Planning Process to Develop the City's Updated SCP

The development of the City's updated SCP was conducted in a series of steps that consisted of the following activities, as listed below and shown in the flow chart presented in Figure 1-2. The SCP development process included the following:

- Data collection and mapping of existing stormwater facilities.
- Documentation of the City's existing SWMP.
- Listing of various City regulatory requirements and SWMP objectives.
- Review and analysis of the City's SWMP in comparison to the future regulatory requirements and activities needed for NPDES Permit compliance.
- Locating and assessing existing flooding problems.
- Identifying capital and maintenance needs.
- Developing an annual Capital Facilities Plan.

- Compiling the above SWMP elements into a guidance document that establishes needed SWMP activities, CIPs, annual staffing, and funding levels.

Figure 1-2: Stormwater Comprehensive Plan Development Process



1.3 OVERVIEW AND ORGANIZATION OF THE SCP

This SCP is organized according to the following seven chapters. The content of each chapter is summarized below.

1.3.1 Chapter 1: Introduction

Chapter 1 summarizes the SCP planning process and provides an overview of the organization, format, and content of the study. It also presents a listing of the goals, objectives, and policies of the City's Drainage Utility and the SWMP.

1.3.2 Chapter 2: Planning Area Characteristics

Chapter 2 summarizes the characteristics of the City's Planning Area and includes a description of this area and discussion of the City's existing stormwater collection system. The study area is characterized by land use, population, climate, topography, and soils.

1.3.3 Chapter 3: Regulatory Requirements

Chapter 3 summarizes the stormwater regulatory requirements, under which the City is currently operating, or could be in the near future including: the Clean Water Act (CWA), the Endangered Species Act, the Puget Sound Action Agenda, the Growth Management Act, and regional watershed planning, coordination, and funding.

1.3.4 Chapter 4: Operation and Maintenance

Chapter 4 summarizes the existing Operation and Maintenance (O&M) Program and makes recommendations for a future O&M program, including staffing and expenses. Like the SWMP, the future O&M program is designed around the requirements of a future NPDES Phase II Permit.

1.3.5 Chapter 5: Stormwater System Hydrologic and Hydraulic Modeling

Chapter 5 summarizes the methodologies and results of the hydrologic and hydraulic stormwater system modeling process. It explains how modeling was used to evaluate the capacity of the existing drainage system, locate deficiencies, and develop engineering designs, in order to formulate the list of needed capital projects and their estimated costs.

1.3.6 Chapter 6: Capital Improvement Program

Chapter 6 summarizes the recommended stormwater CIP projects, including detailed descriptions, project sketches, and cost estimates. Problem areas and proposed projects are rated and ranked to form the prioritized annual CIP presented in this chapter.

1.3.7 Chapter 7: Future Stormwater Management Program Recommendations

Chapter 7 summarizes the future SWMP recommendations, including the results of the SWMP gap and CIP analyses. The recommendations include those stormwater activities needed to address the requirements of a future NPDES Phase II Permit, as well as CIP project needs and associated annual levels of staffing and funding.

1.3.8 Appendices

The documents included in the appendices provided technical support for the creation of the SCP. They were specifically designed to create the products needed to develop an effective SWMP and include the following:

1.3.8.1 Appendix A: Technical Support Documents

This first appendix includes a collection of documents that were used during the SCP development process, including goals/objectives/polices of the City's Drainage Utility, lists of data requests to the City, Public Drainage Survey, SWMP Questionnaire to City staff, results of the Public Drainage Survey, City's annual budget documents, technical memorandums from Northwest Hydraulic Consultants (two memoranda: Modeling Needs Recommendations for Stanwood SWMP and Douglas Creek Basin Detention Pond Tour Summary), memoranda of understanding between the City and the Stillaguamish Tribe as well as with Snohomish County, and information about the WRIA 5 Stillaguamish Watershed.

1.3.8.2 Appendix B: Stormwater Management Program Gap Analysis

This appendix includes a copy of the SWMP Gap Analysis. This is the detailed matrix analysis that lists and describes local drainage needs and regulatory requirements and

documents corresponding elements of the City's existing SWMP. It notes discrepancies and promotes recommended activities, staffing, and costs for the recommended SWMP and CIP projects.

1.4 LISTING AND OVERVIEW OF RELATED STUDIES

The Stillaguamish River and watershed are extremely important to the region. It is one of the few remaining watersheds within the Puget Sound basin that are relatively undeveloped, and it still maintains a number of native and hatchery-enhanced fish runs of various species of salmon, as well as steelhead trout. The upper reaches may have bull trout habitat, as well. This is also a relatively young and very active river, as the recent massive mudslide upstream at Oso, Washington, has demonstrated. Because it is young and active in a geologic sense, the river is unpredictable and subject to a number of floods of varying sizes on an annual basis. The Stillaguamish River Flood Control District has been formed to assist in the prediction and management of major flood events that impact the lower reaches of the river and maintains a supporting system of levees, dikes, and ditches.

Because of its natural ecological and economic importance, the Stillaguamish River has been the subject of numerous studies over the past several years. Some of the more important and recent investigations are briefly summarized below. These studies include the following:

- *The City of Stanwood Comprehensive Flood Hazard Management Plan (CFHMP) Phase I and II*
- *Stanwood Urban Growth Area Drainage Needs Report DNR No. 7*
- *The Douglas Creek Rural Drainage Needs Report*
- *City/County Regional Water Quality Study*

There are also eleven additional drainage-related studies that have been provided in the bibliographical listing which is presented in Section 1.5 below.

1.4.1 City of Stanwood CFHMP Phase I and II

The City of Stanwood Comprehensive Flood Hazard Management Plan (CFHMP) was prepared by KCM, Inc., in 1997 to address current flooding problems and plan for future development. The CFHMP was conducted in two phases, I and II. Phase I focused on flooding associated with the City's storm drainage system and Phase II focused on flooding associated with the Stillaguamish and Skagit Rivers. Both phases are discussed below.

- **Phase I, July 1997:** Phase I of the City of Stanwood's CFHMP addresses the flooding problems within the City's drainage system and plans for future development. The goal of this CFHMP is to develop an approach to provide recommendations to solve existing drainage problems and prevent new development from creating additional problems. This goal was met by defining and analyzing the City's drainage basins and stormwater control facility characteristics. Alternatives were prepared and evaluated to develop

recommendations for new drainage facilities that could mitigate existing and future storm drainage problems. An objective of this planning process was to reach project goals, while achieving benefits to water quality, recreation, and preservation or enhancement of environmental features such as wetlands and fish and wildlife habitat.

- **Phase II, June 1997:** Phase II of Stanwood's CFHMP was to address flood hazard management issues within the City that were associated with both the City's storm drainage system and the Stillaguamish and Skagit Rivers. The primary goal of this plan is to identify and evaluate flooding problems in the City caused by the Stillaguamish and Skagit Rivers and to develop cost-effective alternatives for their mitigation. This plan evaluated historical floods and flood management practices, highlighted previous investigations, identified flood problem areas, provided flood hazard management options, analyzed flood hazard management alternatives, discussed funding options, and provided recommendations for capital improvements and priority actions.

1.4.2 Stanwood Urban Growth Area Drainage Needs Report No. 7

The Stanwood Urban Growth Area (UGA) Drainage Needs Report No. 7 was prepared by Snohomish County Public Works Department Surface Water Management Division in December of 2002. The Stanwood UGA Drainage Needs Report (DNR) is one of a series of eleven drainage plans completed for Snohomish County's Urban Growth Areas (UGAs). The purpose of the DNR project was to plan for existing and future drainage infrastructure needs in a way that identifies how to reduce road and property flooding, protect and enhance aquatic habitat, and reduce stormwater pollution. This plan identifies flooding and surface water problems and recommends solutions.

1.4.3 Douglas Creek Rural Drainage Needs Report

Objectives of the Douglas Creek Rural Drainage Needs Report, initiated by Snohomish County in 2013, are to understand how the drainage system works and to find out where the problems and deficiencies are located. This report analyzes the drainage system connections, sizes, operation, and elevations within the lower portions of Douglas Creek, an Unnamed Slough, and Irvine Slough. It includes an analysis of the depth and duration of seasonal flooding in adjacent agricultural fields and their causes. It also proposed solutions for the flooding of the lower drainage systems by looking at both source control and increases in drainage capacity within the lower reaches of the system.

1.4.4 City/County Regional Water Quality Study: Irvine Slough at Stanwood

This study was provided by Snohomish County Public Works, Surface Water Management Division. Based on water quality monitoring conducted by the Washington State Department of Ecology in 2000/2001, as part of the Stillaguamish River Multi-Parameter Total Maximum Daily Load Plan, the water quality of the Irvine Slough was found to exceed

the standards for coliform bacteria and was listed on the Clean Water Act 303d List of impaired water bodies in 2004 and 2008. To address the pollution in the slough, the City of Stanwood is working with Snohomish County to monitor water quality, identify potential inputs of pollutants, and correct the sources of contamination. In 2012, the City and the County established four sample sites and collected fecal coliforms, total suspended solids, temperature, and dissolved oxygen samples within the City limits along Irvine Sough. Results showed a strong correlation between the operation of the pump station and fecal coliform concentrations. On-the-ground observations suggested that improving the flow out of Irvin Slough, by increasing the frequency of pumping or removing the pump station, may reduce stagnation, elevate dissolved oxygen, and reduce fecal coliform concentrations. Improving flow to reduce stagnation would require additional feasibility studies to evaluate engineering design options, as well as explore various slough and pump station operational alternatives.

1.5 REFERENCED PLANS AND STUDIES

The following plans, reports, and studies were used as reference materials in the preparation of this Plan:

- Quality Assurance Protection Plan, (August 2006). *Old Stillaguamish River Multi-Parameter Total Maximum Daily Load Study* (Publication Number 06-03-108). Published by Washington State Department of Ecology. Olympia, Washington.
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- 2012 Water Quality Monitoring Report: Irvine Slough at Stanwood, (2014). Jonathan Nagata, et al., Snohomish County Public Works Department Surface Water Management Division. Everett, WA.

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CHAPTER 2
CHARACTERISTICS OF THE STORMWATER PLANNING AREA

2.1 INTRODUCTION

To characterize the City of Stanwood from a drainage and stormwater management perspective, the technical information presented in Chapter 2 has been grouped according to the following topics: planning area, drainage system, and physical features, as outlined below.

Description of the Planning Area

- Location
- Land Use
  - Existing
  - Future
- Population
  - Existing
  - Future

Description of the City's Stormwater Drainage System

- Drainage Basins and Watersheds
- Existing Stormwater Collection System
  - Description of the Collection System
  - Major Drainage Features
  - Pipe Sizes and Materials

Description of the Physical Features of the Planning Area

- Climate
- Topography
- Soils

2.2 DESCRIPTION OF THE STORMWATER PLANNING AREA

2.2.1 Location of the City of Stanwood

The City of Stanwood (City) is located in Snohomish County to the west of Interstate 5, just south of Skagit Bay and north of the Stillaguamish River. The Stormwater Management Program (SWMP) Planning Area totals 3.5 square miles and includes the City's Urban Growth Area (UGA) (see Figure 2-1).

2.2.2 Land Use

The City of Stanwood has grown over the last several years and is projected to continue to grow at a steady pace in the future. While being primarily a residential community, the City's economy is diversifying and future population projections have the City exceeding a population of 11,000 by year 2035. It is likely that the amount of new residential areas will increase more rapidly than growth of new commercial/industrial areas. Below is a brief overview of existing and future land use. This land use section is followed by a section that presents existing and future population estimates and lists future population trends.

2.2.2.1 Existing Land Use

The existing City limits encompass an area of approximately 2.8 square miles (1,775 acres). The City's current UGA encompasses an additional 0.72 square miles (459 acres) outside of the current City limits, for a total area of 3.5 square miles (2,234 acres), as graphically shown in Figure 2-1.

2.2.2.2 Future Land Use

The City's Comprehensive Plan identifies future land uses and guides development within the City and its UGA. Land Use outside of the City is designated by the County. For future land use projections, the City has been divided into six major land use types, as shown in Table 2-1: Residential, Commercial, Industrial, Public Facility, Farmland, and Non-designated. The associated future land use data is displayed in Figure 2-2.

According to future land use projections, approximately 59 percent of the area within the existing City limits is designated for residential use. Approximately 11 percent of the City is designated for future commercial land use, 7 percent for industrial land use, and 17 percent for public facilities. The remaining 6 percent of the land area within the City limits is non-designated right-of-way or other City property, and includes SR 532.

Within the City's unincorporated UGA, a higher percentage of future land use, approximately 65 percent, is designated for residential use, as shown in Table 2-1. The remaining land area within the unincorporated UGA is designated for commercial and industrial use, or is non-designated right-of-way.

Table 2-1: Future Land Use

Land Use Type	City Limits	Unincorporated UGA
Residential[1]	59.4%	57.4%
Commercial[2]	10.6%	4.1%
Industrial	6.6%	30.3%
Public Facility	17.2%	0.1%
Farmland	N/A	N/A
Non-Designated[3]	6.2%	8.1%
Total	**100.0%**	**100.0%**

[1] Residential land use includes residential land use types and traditional neighborhood land use.
[2] Commercial land use includes general commercial, mainstreet business I, mainstreet business II, and other commercial land uses.
[3] Non-designated land uses include rights-of-way.

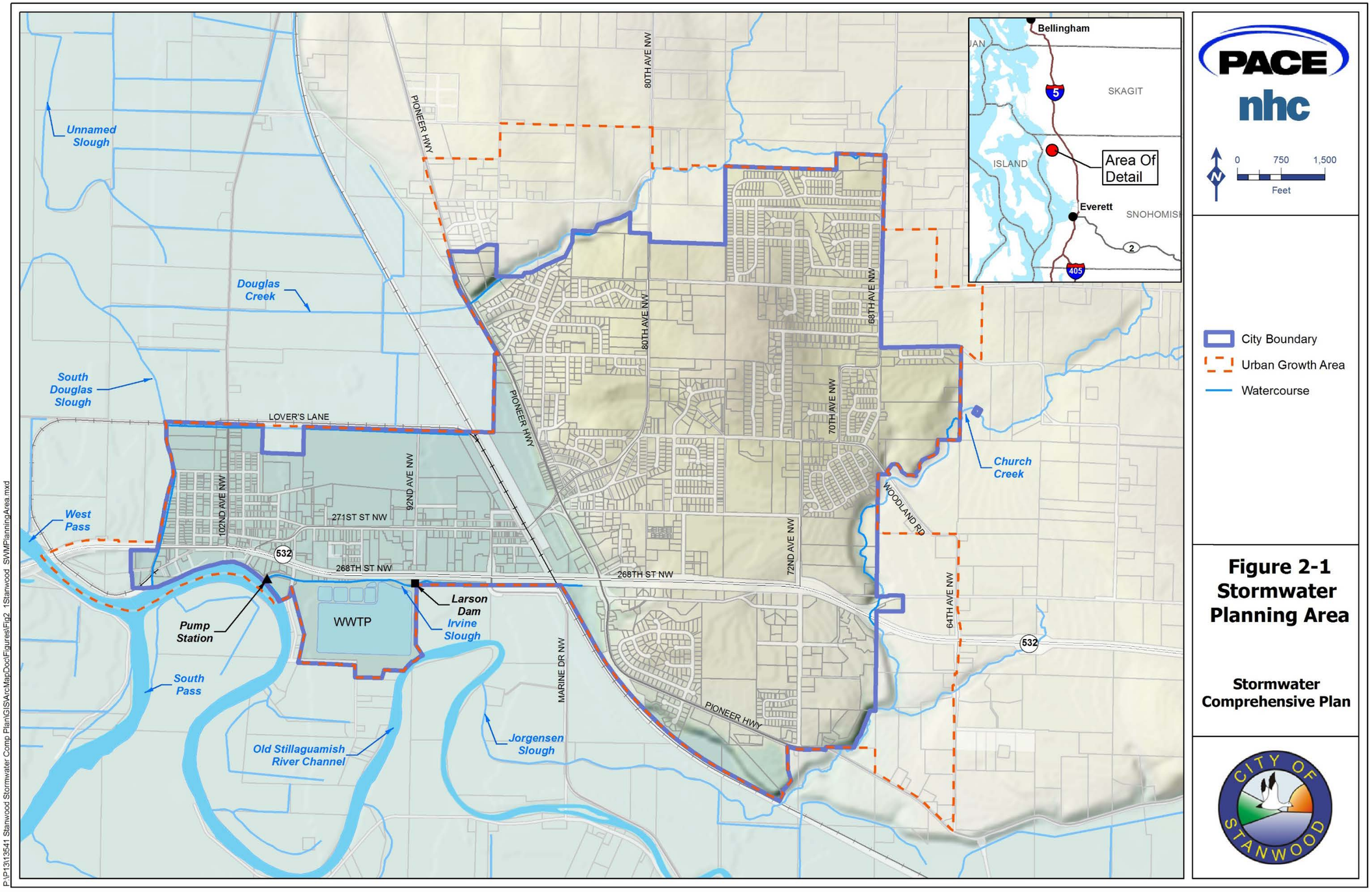
Unnamed Slough
Douglas Creek
South Douglas Slough
West Pass
South Pass
Pump Station
WWTP
Larson Dam
Irvine Slough
Old Stillaguamish River Channel
Jorgensen Slough
Church Creek
LOVER'S LANE
PIONEER HWY
80TH AVE NW
68TH AVE NW
70TH AVE NW
72ND AVE NW
64TH AVE NW
92ND AVE NW
102ND AVE NW
271ST ST NW
268TH ST NW
MARINE DR NW
WOODLAND RD
532
5
405
2
Bellingham
SKAGIT
ISLAND
Everett
Area Of Detail
PACE
nhc
0 750 1,500
Feet
City Boundary
Urban Growth Area
Watercourse
Figure 2-1
Stormwater
Planning Area
Stormwater
Comprehensive Plan
CITY OF STANWOOD
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Figure 2-2
Land Use Map
City of Stanwood, Washington
Stormwater Comprehensive Plan

N W E S

1 INCH = 2,000 FEET
0 2,000 4,000
Feet
DRAWING IS NOT TO SCALE IF BAR IS NOT 2" LONG

LEGEND

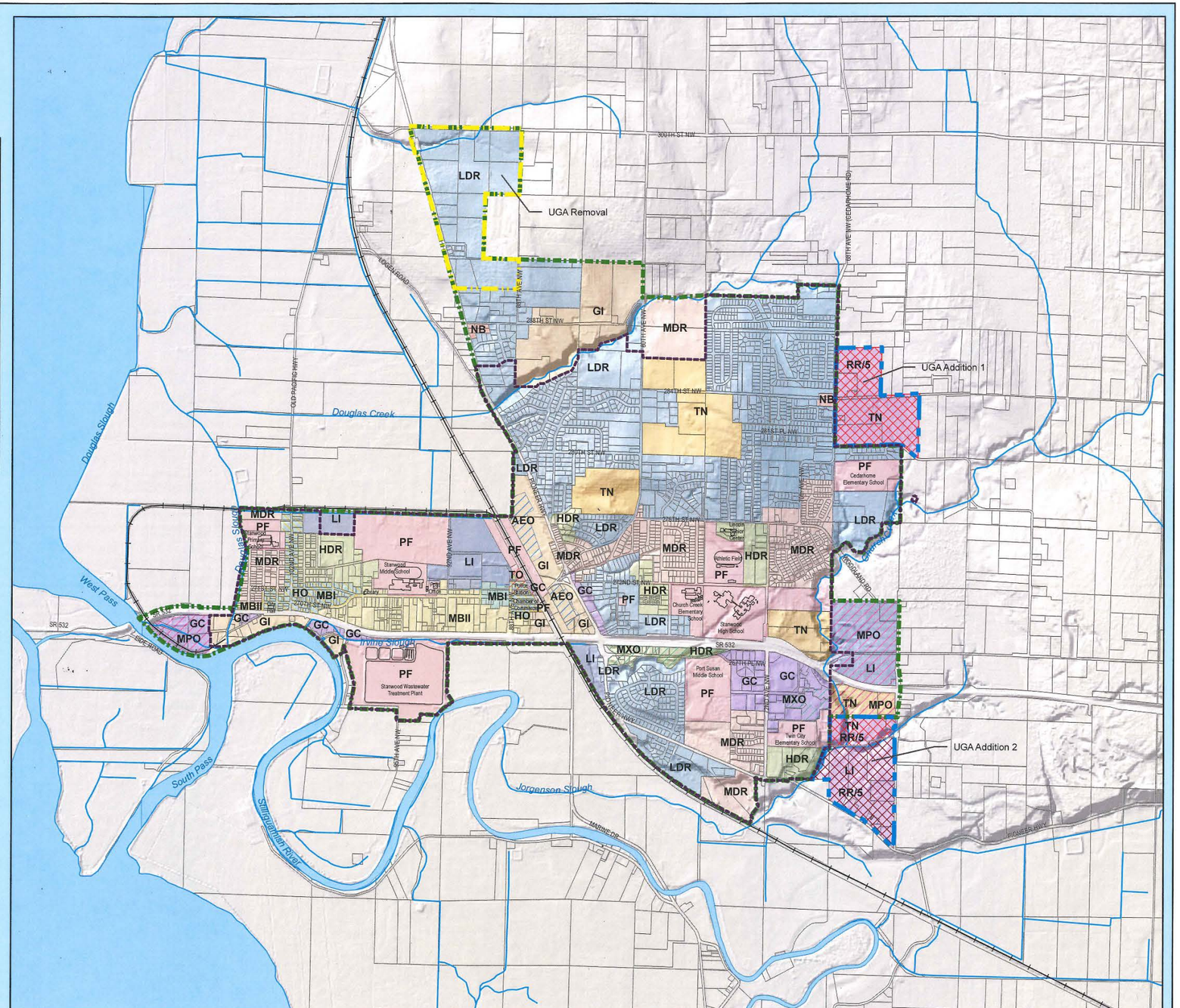
FUTURE LAND USE
- PF, EXISTING PUBLIC FACILITY
- NB, NEIGHBORHOOD BUSINESS
- LDR, LOW DENSITY RESIDENTIAL 3.6-4 DU/ACRE
- MDR, MEDIUM DENSITY RESIDENTIAL 6-10 DU/ACRE
- HDR, HIGH DENSITY RESIDENTIAL
- GC, GENERAL COMMERCIAL
- GI, GENERAL INDUSTRIAL
- LI, LIGHT INDUSTRIAL
- MBI, MAINSTREET BUSINESS I
- MBII, MAINSTREET BUSINESS II
- TN, TRADITIONAL NEIGHBORHOOD
- PARCELS

COUNTY FUTURE LAND USE
- RR/5, RURAL RESIDENTIAL-5

UGA ADDITION FUTURE LAND USE
- TN, TRADITIONAL NEIGHBORHOOD
- LI, LIGHT INDUSTRIAL

FUTURE LAND USE OVERLAY
- AEO, ADULT ENTERTAINMENT OVERLAY
- TO, TRANSIT OVERLAY
- MXO, MIXED USE OVERLAY
- MPO
- HISTORICAL OVERLAY (HO)
- CITY LIMITS
- STANWOOD UGA
- PROPOSED UGA REMOVAL
- PROPOSED UGA ADDITION
- BNSF RAILROAD
- WATERBODY
- WATER COURSE

DIGITAL DATA WERE OBTAINED FROM THE CITY OF STANWOOD, SNOHOMISH COUNTY, WASHINGTON DEPARTMENT OF NATURAL RESOURCES, US FISH AND WILDLIFE SERVICE, US GEOLOGICAL SURVEY AND THE US ENVIRONMENTAL PROTECTION AGENCY.



DATE REVISED: 1/30/2015 By:zschrempp Coordinate System:NAD 1983 StatePlane Washington North FIPS 4601 Feet

J:\DATA\STA\CITYENGR\GIS\MAPS\FIG2-2_STORMWATER_COMP_PLAN.MXD

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2.2.3 City Population

2.2.3.1 Household Trends

The City of Stanwood is a smaller, rural community that benefits from its close proximity to Puget Sound, the Stillaguamish River, and Camano Island. While being largely a residential community with a concentrated commercial business district, it also has a pleasant agricultural atmosphere. This comes from the City being surrounded by many active livestock, dairy, crop-growing enterprises, and family farms.

In 2013 the Office of Financial Management (OFM) estimated that of the 1,889 housing units in the City, about 72 percent were single-family residential, 28 percent were multi-family residential, and of the remaining, less than 1 percent were "mobile homes" or similar structures. OFM data from the State's 2010 Census indicates an average household size in the City of 2.55 persons, and an average household size in the County of 2.62 persons. The average household size reported in the Census is based on an average of the household size for owner occupied housing units and renter occupied housing units. For Stanwood, the average household size for owner occupied units in 2010 was 2.77 and the average household size for renter occupied units was 2.18. The 2012 Buildable Lands Report for Snohomish County utilizes average household size of 2.9 persons per household for single-family units and 2.0 persons per household for multi-family units.

2.2.3.2 Existing and Future City Population

Existing Population
(within City limits and UGA)

The County population has experienced consistent growth with a number of larger developments being completed over the last several years. The City of Stanwood has benefited from both local and regional growth. The population of the County increased approximately 21 percent from 2000 to 2013, based on OFM estimates. The population of the City increased approximately 62 percent during the same period, which included several annexations. Table 2-2 illustrates the historical population growth since 2000, with the years 1980, 1990, and 1995 included for reference. The City's existing 2014 population is estimated to be about 6,530 (190 more than in 2013). The population of the City's UGA is estimated to be 238 and is expected to double by the year 2021, as shown in Table 2-3.

Table 2-2: Historical Population Trends within City Limits	
Year	**Population**
1980	1,646
1990	1,961
1995	2,910
2000	3,923
2001	4,021
2002	4,172
2003	4,323
2004	4,530
2005	4,858
2006	5,287
2007	5,593
2008	5,885
2009	6,073
2010	6,231
2011	6,220
2012	6,300
2013	6,340
2014	6,530
Note: The historical population represents the population within the City limits. The sources of the historical population numbers are the 2010 decennial census and Washington Office of Financial Management intercensal estimates.	

Future Population

(within City limits and UGA)

Projected future growth for the City limits and the unincorporated UGA is shown in Table 2-3. The projected population data was prepared by the City's Community Development Department in conjunction with the current 2014 update of the City's Comprehensive Plan. The 2014 OFM intercensal estimates are the baseline populations for the City and incorporated UGA population projections.

Table 2-3: Population Projections for City and Unincorporated UGA			
Year	**City Population**	**Unincorporated UGA Population**	**Total City and UGA Population**
Projected			
2014	6,530	238	6,768
2015	6,701	273	6,974
2016	7,872	308	7,180
2017	7,043	343	7,386
2018	7,214	378	7,592
2019	7,385	413	7,798
2020	7,556	448	8,004
2021 (+6 Years)	**7,727**	**483**	**8,210**
2022	7,898	518	8,416
2023	8,069	553	8,622
2024	8,240	588	8,828
2025 (+10 Years)	**8,411**	**623**	**9,034**
2026	8,582	658	9,240
2027	8,753	693	9,446
2028	8,924	728	9,652
2029	9,095	763	9,858
2030	9,266	798	10,064
2031	9,437	832	10,269
2032	9,608	867	10,475
2033	9,779	902	10,681
2034	9,950	937	10,887
2035 (+ 20 Years)	**10,116**	**969**	**11,085**

Notes:
Population projections were prepared by the City of Stanwood Community Development Department.
The baseline 2014 population information is based on the OFM intercensal estimates.
The 2035 population estimates are based on the Countywide Planning Policies for Snohomish County.
The projections assume that the City will grow by approximately 171 people per year and the unincorporated UGA will grow by approximately 35 people per year.

The projections for the City and unincorporated UGA populations are based on 2035 growth targets, in accordance with the Countywide Planning Policies for Snohomish County, adopted June 12, 2013. The projections assume that the City will grow by approximately 171 people per year and the unincorporated UGA will grow by approximately 35 people per year. The total City and unincorporated UGA population is expected to experience an average annual growth rate of approximately 2.9 percent, 195 people per year, between the baseline 2014 year and 2035. In year 2035 the total City and UGA population is projected to exceed 11,000.

2.3 DESCRIPTION OF THE CITY'S STORMWATER DRAINAGE SYSTEM

2.3.1 Overview of the City's Stormwater Drainage System

From a drainage perspective the City of Stanwood has two distinct and very different drainage areas. The first includes the older parts of the City to the west that encompass the City Hall, the Library and Downtown. This area is subject to flooding on an annual basis. Excess surface water flows can move toward the City from the south, as well as from the north, with State Route (SR) 532 often acting as a levee. The City's wastewater treatment facility, City Public Works offices and shops, Twin City Foods, several businesses and services, and a few private residences are located on the south side of SR 532. On the north side of SR 532, again in the more western parts of the City, are some of the older residential areas of the City. This area is located almost entirely within the 100 year floodplain. Many of these areas were built with little to no drainage infrastructure and, as a result, regularly experience ponding and standing water during larger rainfall and river flow events. Saturated soils are common in this area during these larger flow/rainfall events and contribute to these types of localized drainage problems by reducing or eliminating any significant infiltration.

Nearly all of the drainage ditches or pipes that exist in this most western part of the City flow via gravity through multiple outfalls under SR 532 and into the Irvine Slough, where they are pumped into the lower reaches of the Stillaguamish River. In addition to Irvine Slough, there is also one gravity outfall into the river from the South Douglas Slough, located just to the west of Twin City Foods, that is currently considered inoperable. Flows that would discharge via gravity from the South Douglas Slough are often backed up and are forced to flow into Irvine Sough via the Lover's Lane/92nd Avenue stormwater conveyance system prior to their discharge through the pump station. In general, the systems in the western portion of the City are undersized and lack adequate outfalls, rendering the gravity flow system(s) ineffective in dewatering the low-lying downtown areas during larger storm/flow events.

The City's stormwater collection system consists of older areas with systems in varying states of repair, areas with newer systems associated with residential developments constructed after 1990, and areas without any formal, visible collection or conveyance system. The most chronic flooding concerns are located in the City's most western lowlands, where flat topography, high tidal conditions, high groundwater, and flows from the Stillaguamish River limit the ability of the inner parts of the City's downtown area to drain via gravity into Irvine Slough or directly into the river.

The second drainage area of the City lies on the gently sloping hillside east of the older downtown area, east of the Burlington Northern Santa Fe (BNSF) railroad tracks and Pioneer Highway. This second area is located outside the 100 year floodplain. The developments in this part of the City are, in general, newer and consist of drainage systems composed of pipes, ditches, and culverts alongside the roads to catch and manage the excess surface water flows. There is also a series of two dozen or more detention ponds that serve the detention and water quality needs of the newer developments. There are only a few localized drainage problems in this more eastern, developed part of the City. One of the more significant problems in this area of the City is the seepage of subsurface water and groundwater in and along 85th Drive NW.

As a result of the unique and distinctly different land use and drainage needs of these two drainage areas within the City, this SCP reviewed the elements of the City's drainage system

in different ways. Drainage problems in both areas of the City were identified through a public survey, field walks, interviews with City staff, flood records, and public complaints. Within the older, low-lying parts of the City, it was necessary to use modeling to evaluate flow capacity, estimate pipe diameters, and develop designs to address low-lying drainage issues, in order to provide an updated list of needed CIP projects.

2.3.2 Drainage Basins and Watersheds

The City of Stanwood includes five major drainage basins, all draining to the Stillaguamish River or Puget Sound. The five basins include: Douglas Creek and Unnamed Slough, Church Creek, Irvine Slough, Skagit River, and the Stillaguamish River, as shown in Figure 2-3.

Topographically, the City is divided into moderately sloped uplands to the east and flat floodplain areas to the west. Most of the upland portions of the City are located within the Douglas Creek, Irvine Slough, and Church Creek basins. The most western area is tributary to the lower reaches of the Stillaguamish River and adjacent estuary areas of Puget Sound.

The boundaries of these basin areas were updated using a number of sources: delineations from previous projects completed by NHC (2006 and 2014), the City's legacy basin delineations, and new basin delineations performed as part of this project for hydrologic modeling.

Douglas Creek and Unnamed Slough: The Douglas Creek watershed drains 2,425 acres and originates outside the Stanwood UGA. In general, it is composed of two tributaries, one east of 68th Avenue NW and a second tributary north of 300th Street NW. The upland portions of the basin are largely rural outside the UGA, with moderate density residential inside the UGA. The lowland portions of the basin are primarily in various agricultural land uses.

The Unnamed Slough basin, located immediately north of Douglas Creek, is not located within the Stanwood UGA, but the basin is interconnected with the Douglas Creek ditch network, and the system can effect flows in Douglas Creek and the City's 92nd Avenue conveyance system. The Unnamed Slough basin is relatively small at 330 acres and is nearly exclusively in agricultural land uses. It normally plays only a minor role in contributing to major flood events within the City.

Church Creek: The Church Creek watershed drains 6,994 acres and also originates outside the Stanwood UGA, north of 300th Street NW and east of I-5. Current land uses are predominately rural residential development in the upper portions of the watershed, with higher density residential and some urban development in the middle of the watershed, in the vicinity of Stanwood High School and SR 532. The lower portions of the watershed, located on the Stillaguamish River floodplain, are primarily in agricultural land uses.

Irvine Slough: The Irvine Slough watershed drains 1,126 acres and originates within the Stanwood UGA near 72nd Avenue NW. This watershed is the most developed within the City, and includes the historic downtown and the Lindstrom Road commercial centers, as well as large tracts of older residential development. Irvine Slough discharges to the Stillaguamish River via the Irvine Slough Pump Station.

Skagit River: The Skagit River is located a few miles to the north of the City's UGA. Portions of the Stanwood drainages that flow directly into Skagit Bay include the Unnamed Slough and a small area of another unnamed waterway on the north edge of the UGA. These areas, and the tide flats west of the local levee system, are considered part of the Skagit River watershed. Douglas Creek also discharges into Skagit Bay via West Pass and is technically a tributary of the Stillaguamish River, but it is mapped within the Skagit River Watershed on Snohomish County basin maps.

Stillaguamish River: In addition to the Douglas Creek, Church Creek, and Irvine Slough basins, all of which discharge into the Stillaguamish River, there is also a small portion of the City's UGA, including the City's wastewater treatment plant that is directly tributary to the Stillaguamish River and flows directly into the old Stillaguamish River channel via gravity.

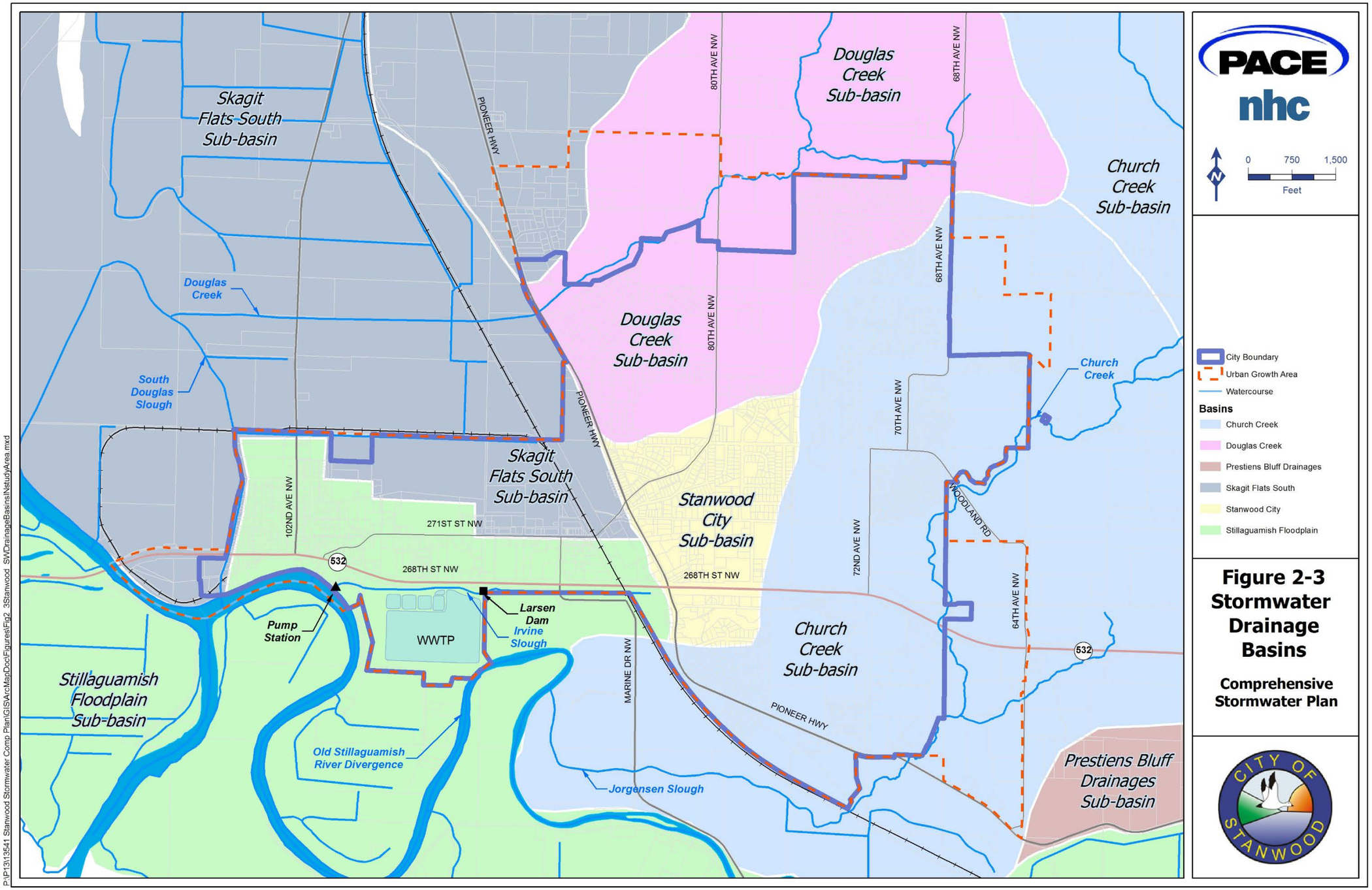

Figure 2-3 Stormwater Drainage Basins

Comprehensive Stormwater Plan

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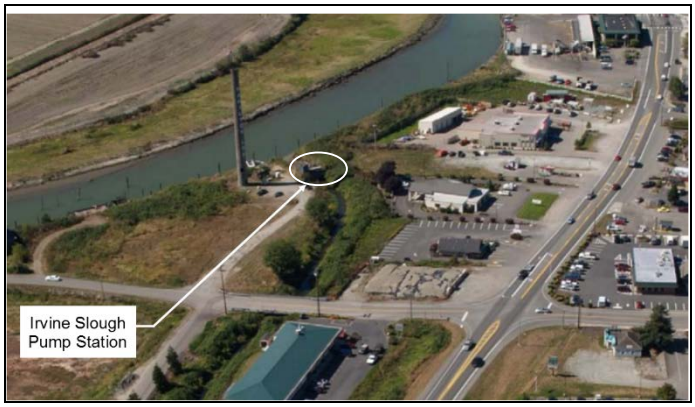
2.3.3 Layout and Discharges of the City's Stormwater Drainage System

As described above, most of the City's stormwater currently discharges into the Stillaguamish River via Irvine Slough and the Irvine Slough Pump Station. This is the City's primary outfall/dewatering system and the location of the outfall is shown as Outfall #1 in Figures 2-4 and 2-5. The Irvine Slough Pump Station and Outfall are located just west of the City's wastewater treatment plant on the south side of SR 532.

Figure 2-4: Photos of the Irvine Slough Pump Station – Outfall #1



Irvine Slough and Pump Station
(taken from east Stanwood, 2010, NHC)

Irvine Slough Pump Station
(taken January 8, 2013, NHC)

There are three other conveyance systems and outfalls that play a role in routing surface water around the City or in removing excess surface water from within the City. They include the following:

- *Outfall #2 – The Outfall next to the City's Wastewater Treatment Plant*
  This outfall, just east of the Irvine Slough Pump Station, is a continuation of the major collection and conveyance system that starts at the City limits to the north along Lovers Lane and connects via open ditches along 92nd Avenue NW. It continues along 92nd Avenue NW, goes under SR 532, and flows via gravity into Irvine Slough, where it is pumped through the Irvine Slough Pump Station directly into the Old Stillaguamish River channel.
- *Outfall #3 – The Douglas Creek Outfall*
  Douglas Creek, which is interconnected with the Unnamed Slough to the north and the Irvine Slough to the south, discharges via multiple outfalls. Some of the excess flow from Douglas Creek can enter from the north into the City's drainage system during the larger more regional storm/flow events. The primary outfall of Douglas Creek is the outfall that discharges to the West Pass of the Stillaguamish River, and consists of six pipes. Each of these pipes has a separate tide gate; all discharges from these pipes are recombined in a single, large channel just before discharge into West Pass.

- *Outfall #4 – South Douglas Slough Outfall*
  The South Douglas Slough Outfall is interconnected with Douglas Creek to the north, where the creek channel takes a turn to the northwest and then sharply turns to the southwest and enters West Pass. The South Douglas Slough channel connects to Douglas Creek where the creek channel turns to the northwest, and flows generally southward until it connects with the most western border of the City. At this point it enters the City, flows under SR 532, and discharges directly into the Old Stillaguamish channel, just before the river channel splits to form the West Pass and South Pass. This outfall has a tide gate on it which often does not function properly. The water in this slough can flow in either direction, depending on the tidal cycle. It is usually the larger, more regional storm/flow events that send water to the south through the City to be discharged into the river.

2.3.4 Inventory and Mapping of the City's Stormwater Drainage System

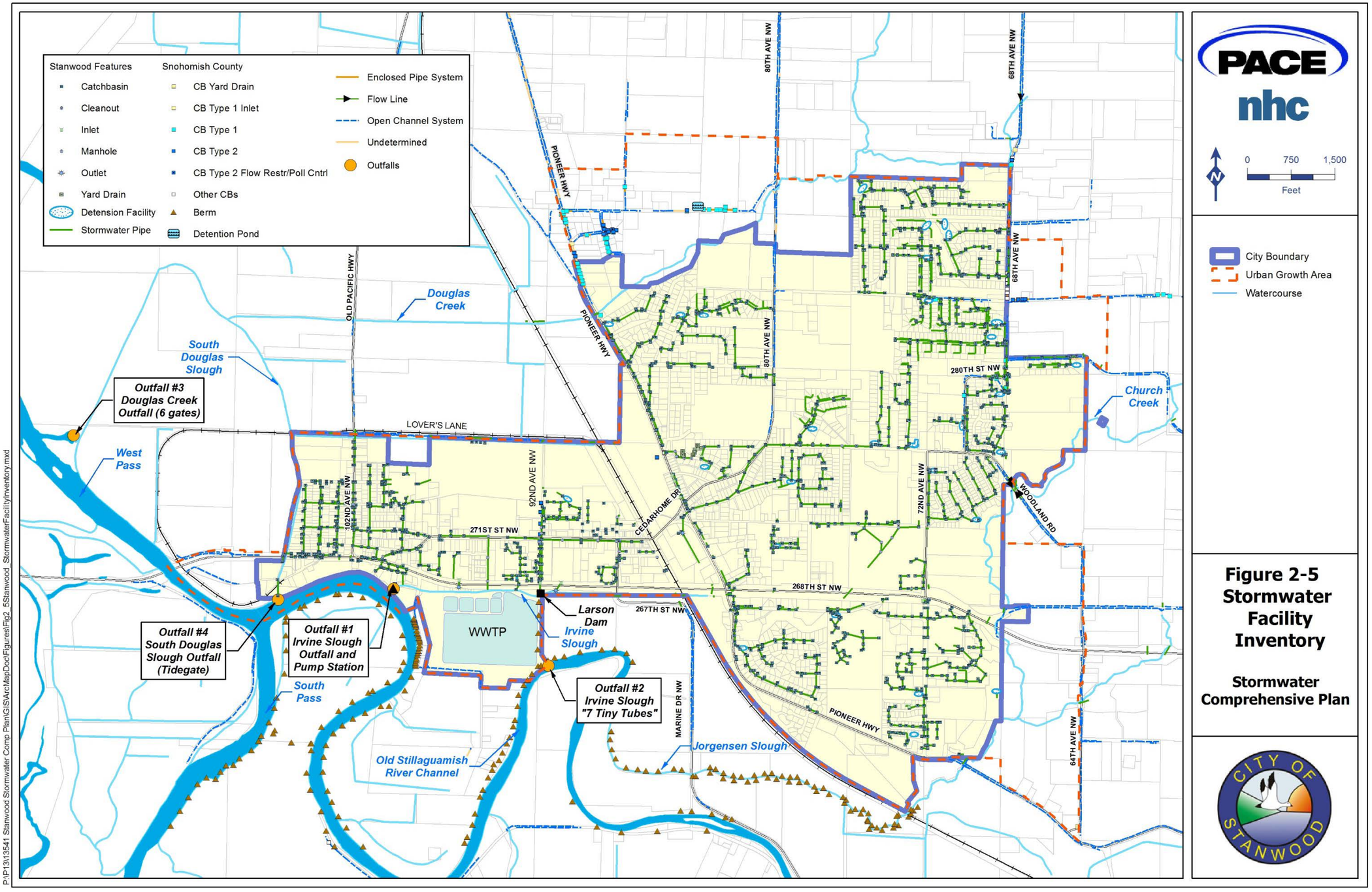
During this study, significant effort has been put into mapping and characterizing the City's existing drainage system. This detailed characterization was particularly useful in identifying problem areas, responding to citizen drainage issues, prioritizing and conducting maintenance, analyzing the capacity of the system, and developing designs and capital projects for the updated capital facilities plan, as presented in Chapter 6 of this Plan.

Schematic diagrams of the City's existing stormwater drainage system are presented in Figures 2-5, 2-6, and 2-7, and Appendix A.3, and consist of the following technical information that describe the City's collection and conveyance systems:

- Figure 2-5: Stormwater Facility Inventory
- Figure 2-6: City and County Drainage Network
- Figure 2-7: Major Stormwater Drainage Facilities
- Appendix A.3: City of Stanwood – List of Detention Facilities

Some of the interesting and unique characteristics of the City's existing drainage system are described below.

- The City's stormwater system consists of over 35 miles of stormwater conveyance that includes ditches and pipes varying from 4 to 48 inches in diameter.
- There are four major outfalls, and the primary discharge is through the Irvine Slough Pump Station directly into the old Stillaguamish River channel, just southwest of the City. *(Note that the four outfalls include: Irvine Slough Pump Station, Irvine Slough "7 Tiny Tubes," South Douglas Slough just west of Twin City Foods, and Douglas Creek tubes to West Pass.)*
- Many of the City's interior piped systems are not connected to a major outfall or point of discharge.
- In many areas, the system is primarily made up of undersized, flat ditches and pipes, some of which have high spots and/or reversed grades that inhibit their ability to effectively drain..
- In general, there are a number of isolated drainage problems on the eastern hillside; they are most often associated with undersized or improperly maintained detention ponds or the seepage of shallow groundwater.


Stanwood Features
Catchbasin
Cleanout
Inlet
Manhole
Outlet
Yard Drain
Detension Facility
Stormwater Pipe
Snohomish County
CB Yard Drain
CB Type 1 Inlet
CB Type 1
CB Type 2
CB Type 2 Flow Restr/Poll Cntrl
Other CBs
Berm
Detention Pond
Enclosed Pipe System
Flow Line
Open Channel System
Undetermined
Outfalls
PACE
nhc
0 750 1,500
Feet
City Boundary
Urban Growth Area
Watercourse
Figure 2-5
Stormwater
Facility
Inventory
Stormwater
Comprehensive Plan
CITY OF STANWOOD
Douglas Creek
South Douglas Slough
Outfall #3 Douglas Creek Outfall (6 gates)
West Pass
Outfall #4 South Douglas Slough Outfall (Tidegate)
Outfall #1 Irvine Slough Outfall and Pump Station
South Pass
Old Stillaguamish River Channel
WWTP
Larson Dam
Irvine Slough
Outfall #2 Irvine Slough "7 Tiny Tubes"
Jorgensen Slough
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OLD PACIFIC HWY
LOVER'S LANE
PIONEER HWY
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68TH AVE NW
280TH ST NW
102ND AVE NW
92ND AVE NW
271ST ST NW
CEDARHOME DR
72ND AVE NW
WOODLAND RD
268TH ST NW
267TH ST NW
MARINE DR NW
64TH AVE NW
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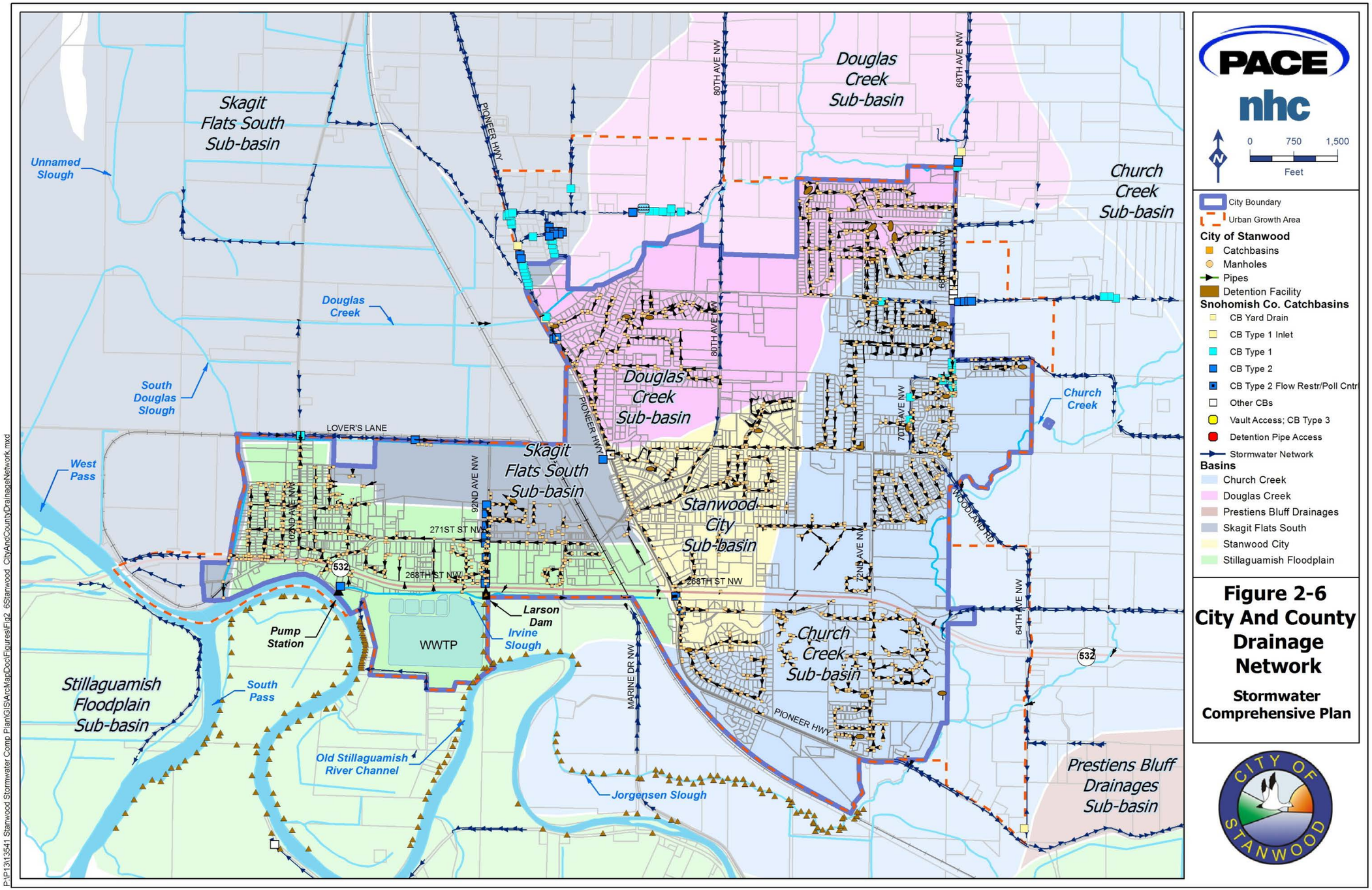

Figure 2-6
City And County Drainage Network
Stormwater Comprehensive Plan

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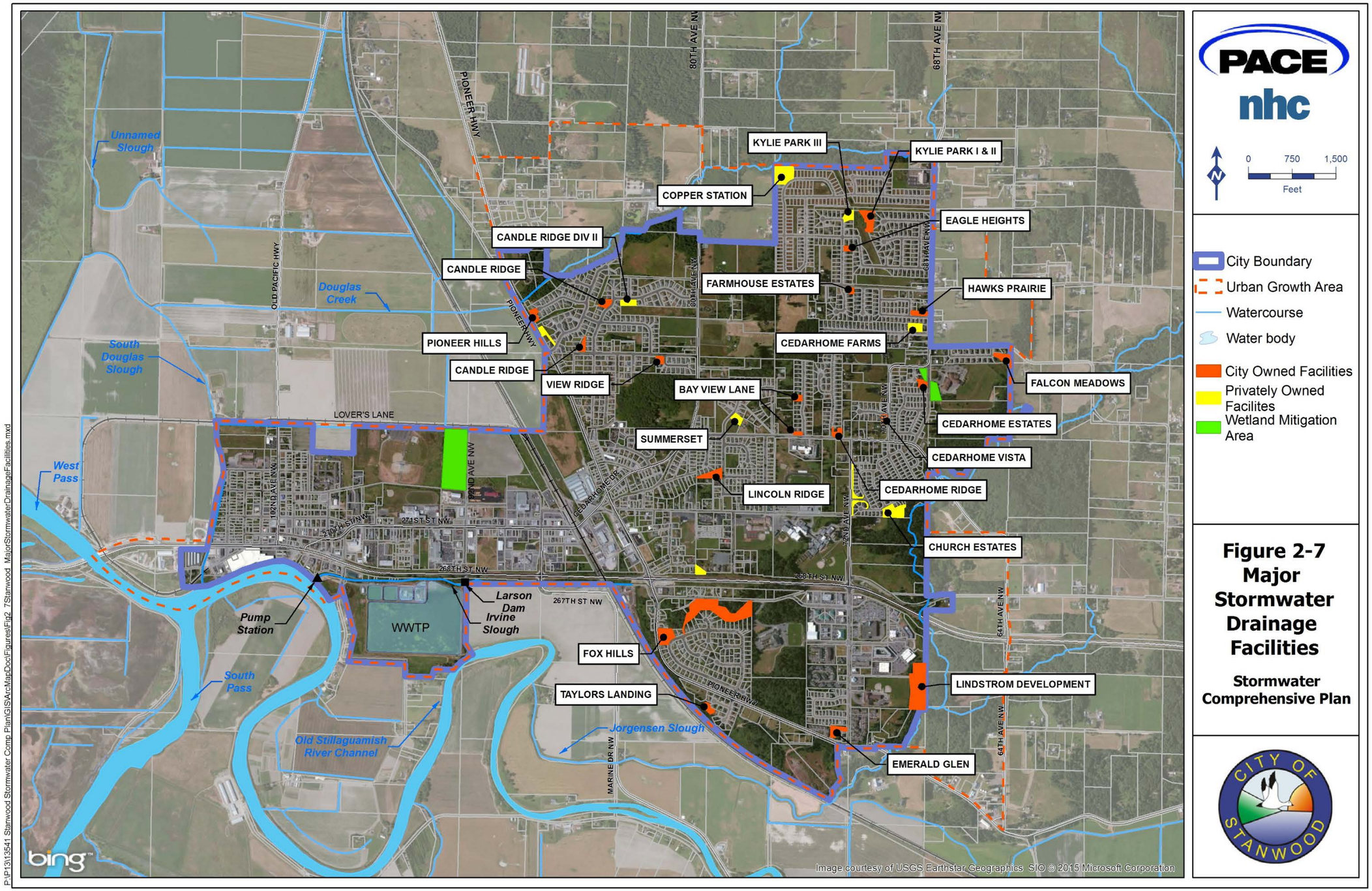

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- In comparison, the problems in the older, western part of the City are more regional in nature and are often caused by the lack of local drainage facilities, high groundwater, and/or by having undersized facilities that are hindered from draining due to their flat slope, reverse grades, and/or shallow depth (i.e., being at/or below sea level).
- Some of the pipes underlying the older parts of the City are of a small diameter and are often not able to gravity drain to Irvine Slough due to the lack of capacity within the slough.
- In general, the most western part of the City's drainage system is undersized and lacks the ability to adequately convey or discharge either via gravity or via the Irvine Slough Pump Station.
- The primary point of discharge for the majority of the City's drainage is through Irvine Slough and the Irvine Slough Pump Station. During significant events, the capacity available to pump stormwater is reduced when riverine floodwater from the Stillaguamish River enters the Irvine Slough Pump Station (slough) forebay (through a 36-inch-diameter pipe through Larson Dam). These flows through the culvert and/or over the dam often fill the Slough for extended periods of time. The flood control gate, located just west of the 92nd Avenue NW dam (Larson Dam), called the "Old Stilly Gate" (Figure 2-8) helps reduce the time that flood waters are in the Stillaguamish River floodplain, but they still often go through or over Larson Dam and have an impact on Irvine Slough.

Figure 2-8: Old Stilly Floodgate

Old Stilly Flood Gate Structure (taken January 8, 2013, NHC)

Additional discussion of the City's drainage system, its capacity, current flooding problems, maintenance, and capital needs is presented in Chapters 4, 5, and 6 of this Plan.

2.3.5 Major Drainage Features of the City's Drainage System

Table 2-4 lists the number and type of major drainage features within the City's drainage system. The majority of the drainage features consist primarily of catch basins totaling 1,671, of which 342 are mapped in the City's facility geodatabase. There is also a total of four primary discharge points, including outfalls to the Irvine Slough and the Stillaguamish River within the City's stormwater system, as shown previously in Figure 2-5.

Table 2-4: Major Drainage Features

Type	Count in Stanwood
Catch Basins	1,671
Discharge Points	4
Detention Facilities	24*

**City of Stanwood 2014 List of Detention Facilities. See Appendix A.3.*

2.3.6 Piped Conveyance Facilities Within the City's Stormwater System

The City's stormwater system consists of over 35.1 miles of stormwater pipes that vary from 4 to 48 inches in diameter, as shown in Figures 2-5 and 2-6 and listed in Table 2-5. An inventory of the City's GIS geodatabase lists the length of pipe for each different type of pipe material. The following pipe materials have been designated within the Utility's stormwater geodatabase:

- Clay (CLAY)
- Corrugated Metal Pipe (CMP)
- Concrete (CON)
- Corrugated Polyethylene Pipe (CPEP)
- Ductile Iron (DI)
- Polyethylene (PE)
- Poly Vinyl Chloride (PVC)
- Reinforced Concrete Pipe (RCP)
- Steel Reinforced Polyethylene (SRP)
- Steel (STL)
- Unknown (or yet to be identified pipe materials)

The City's stormwater system consists of 4 major outfalls, 24 detention ponds, 1,671 catch basins, and over 35.1 miles of stormwater conveyance that includes ditches and pipes varying from 4 to 48 inches in diameter.

Table 2-5: Size and Length of Pipes in the City's Drainage System[1]

Size (inches)	Total Length (ft) in Stanwood
Undefined / Ditches	151,718
4	37
6	247
8	2,774
10	1,733
12	8,913
15	1,474
18	5,159
21	606
24	8,501
30	1,017
36	2,797
48	398
Total	**185,374**

[1]*Based on review of the City's existing GIS Geodatabase.*

2.4 DESCRIPTION OF THE PHYSICAL FEATURES OF THE STUDY AREA

2.4.1 Climate/Rainfall Events

The City is part of the Skagit Bay geographic region, and experiences marine climate characteristics typical of the West Coast region. Average annual precipitation in this area is approximately 20.5 inches, with the highest average rainfall month being November. The average coolest month is December, with an average low of 35 degrees. The average warmest month is August, with an average high of 74 degrees[1].

The mean annual precipitation data for the City from isopluvial maps published by the Department of Ecology for Western Washington are approximately[2]:

- 2-year, 24 hour: 1.25 inches
- 10-year, 24 hour: 1.75 inches
- 100-year, 24 hour: 3.0 inches

Annual flooding is typical within the Stillaguamish River watershed. Occasionally, there are major storm events that exceed the capacity of the system and cause extensive localized and regional flooding. When these larger rainfall/runoff events occur, there are often extensive damages to homes and businesses, as well as City properties, facilities, and infrastructure. Irvine Slough Pump Station, South Douglas Slough, Douglas Creek to West Pass, and the Irvine Slough "7 Tiny Tubes" outfall located just south of 92nd Avenue NW are the primary points of discharge within the most western part of the City.

Within recent history, the three flood events that have caused major flooding occurred in 1990, 1995, and 2009.

- In 1990, levees around the sewage lagoons were overtopped twice because of heavy rains, and houses to the south of the levees were flooded. Temporary dikes were built across Marine Drive and the railroad beneath the SR 532 overpass, as well as along the west end of Stanwood, to prevent the downtown area of the City from being flooded.
- In 1995, another large rain event caused major flooding in the area, and again flooding in the City was prevented by temporary dikes. Fortunately, the lagoon walls were raised 2 feet in 1991 as a response to previous flooding, which stopped them from overtopping. Sandbags were also placed in strategic locations to keep the water from overtopping into Irvine Slough.
- In 2009, flooding within the City was minimized by several emergency response measures (see photos presented in Figure 2-9), which included the Corps of Engineers raising of the 92nd Avenue NW dam on Irvine Slough (Larson Dam), placement of a sandbag dam under SR 532, and construction of a temporary berm along the south side of SR 532 between 92nd and 88th Avenues NW.

[1] http://www.weather.com/weather/wxclimatology/monthly/graph/98292
[2] Department of Ecology Isopluvial Maps can be found in *Appendix III-A: Isopluvial Maps for Design Storms* of the Stormwater Management Manual for Western Washington <https://fortress.wa.gov/ecy/publications/publications/0510031.pdf>

Figure 2-9: 2009 Flooding Photos

Irvine Slough bridge at 98th Drive NW

Corps of Engineers Emergency Flood Control measures on top of 92nd Avenue dam (Larson Dam)

Flooding South of SR 532

Wastewater Treatment Plant flooding

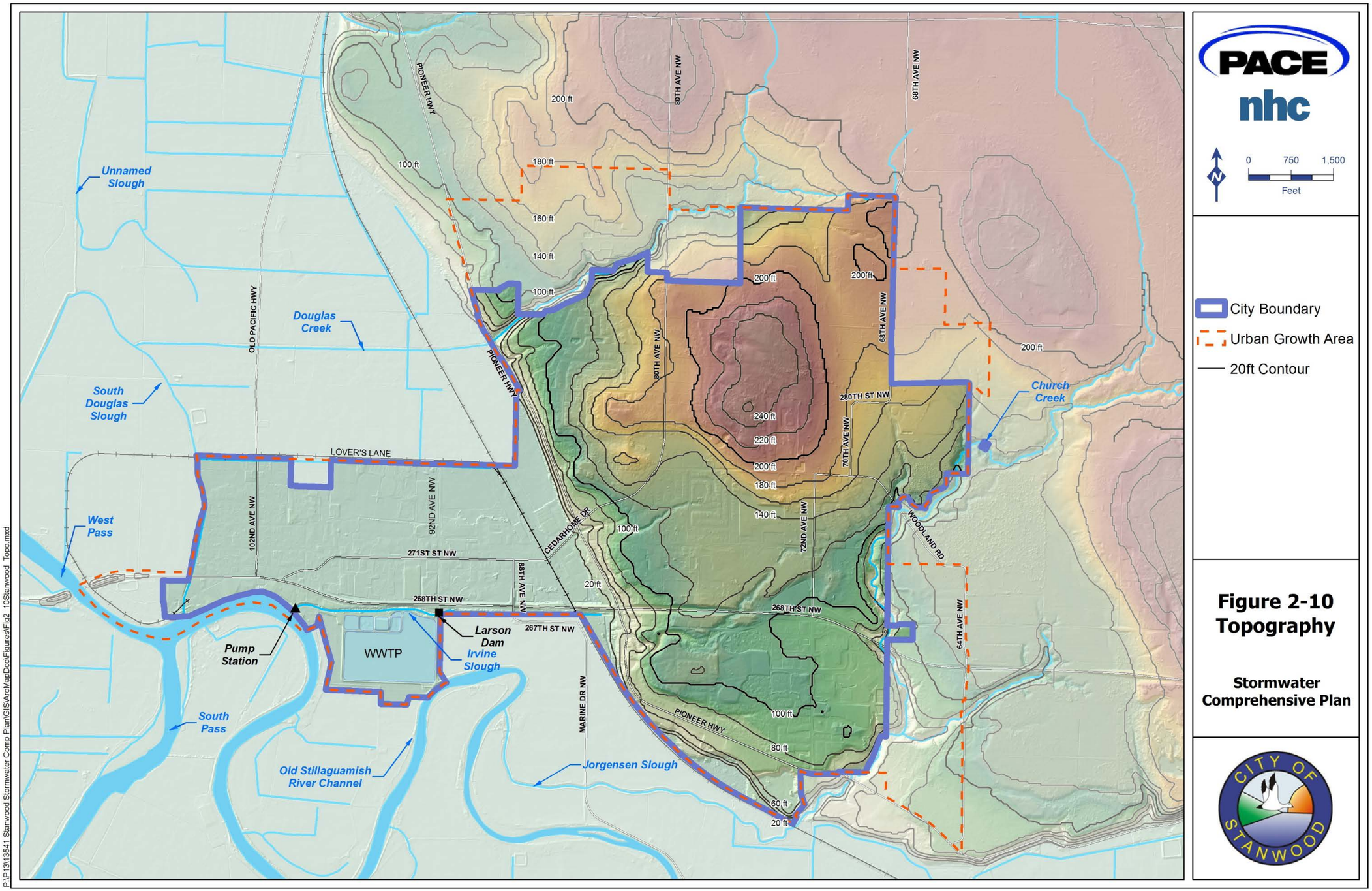
Sandbags stacked under SR 532 bridge

Temporary dam along the South side of SR 532 between 92nd and 88th Avenues

All photos taken January 2009, Courtesy of Everett Herald and City Staff

2.4.2 Topography

The topography of the City varies in elevation from near sea level in the most western parts of the City, to up to about 260 feet above sea level near the most eastern borders of the City. The lowest areas, within the older, most western parts of the City, are located along the Stillaguamish River in southwestern Stanwood and are very close to being within a few feet (0-4 feet) of sea level. Figure 2-10 shows the various topographic elevations throughout the Stanwood Stormwater Planning Area.


PACE
nhc
0
750
1,500
Feet
City Boundary
Urban Growth Area
20ft Contour
Unnamed Slough
Douglas Creek
South Douglas Slough
West Pass
South Pass
Pump Station
WWTP
Larson Dam
Irvine Slough
Old Stillaguamish River Channel
Jorgensen Slough
Church Creek
PIONEER HWY
OLD PACIFIC HWY
LOVER'S LANE
102ND AVE NW
92ND AVE NW
88TH AVE NW
80TH AVE NW
68TH AVE NW
70TH AVE NW
72ND AVE NW
64TH AVE NW
271ST ST NW
268TH ST NW
267TH ST NW
280TH ST NW
CEDARHOME DR
MARINE DR NW
WOODLAND RD
200 ft
180 ft
160 ft
140 ft
100 ft
240 ft
220 ft
80 ft
60 ft
20 ft
Figure 2-10
Topography
Stormwater
Comprehensive Plan
CITY OF STANWOOD
P:\P13\13541 Stanwood Stormwater Comp Plan\GIS\ArcMapDoc\Figures\Fig2_10Stanwood_Topo.mxd

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2.4.3 Soils

The spatial distribution of soils throughout the City and UGA were mapped using data from the National Resources Conservation Service (NRCS) Soil Survey Geographic database. Figure 2-11, entitled HSPF Soil Types, shows the major soil types within the City (1,775 acres), and Table 2-6 provides a tabular summary of each area by soil type. The identified soil types have been classified into four soil categories, each with its own unique hydrologic characteristics for the purposes of hydrologic modeling, as discussed in Chapter 5. Note that of the vast majority of the soils within the City, about 91%, are either saturated or till, both having relatively low infiltration rates. The saturated soils underlie the western part of the City, as well as the southeast part of the City across Pioneer Highway, and continue to the east up the side of the hill. Till soils also cover the majority of the remaining eastern upland portions of the City. Neither type of soil is conducive to infiltration or the use of low impact types of best management practices that might be considered for retrofitting existing facilities, or for adding enhanced water quality treatment. (Note that this soil map was also used in the modeling analysis discussed in Chapter 5.)

The area within the City's UGA (consisting of an additional 429 acres) has a similar mix and consistency of soil types. The majority of the area is dominated by till and saturated solids, and contains, to a lesser extent, smaller amounts of outwash soils and only a small amount of Type C Custer-Norma soil, as can be seen in Figure 2-11.

Table 2-6: Soil Types Within the City of Stanwood

Soil Types	NRCS Hydrologic Soil Group (A, B, C, D)	Total Area (acres)	Percent of Soil Types in the City (%)
Custer-Norma	C	41.6	1.4%
Outwash	A	150.6	7.8%
Saturated (wetland)	D	981.7	56.6%
Till	C	601.5	34.1%
Total		**1,775.4***	**100%**

Notes: Total area excludes manmade soil classifications, such as pilings.

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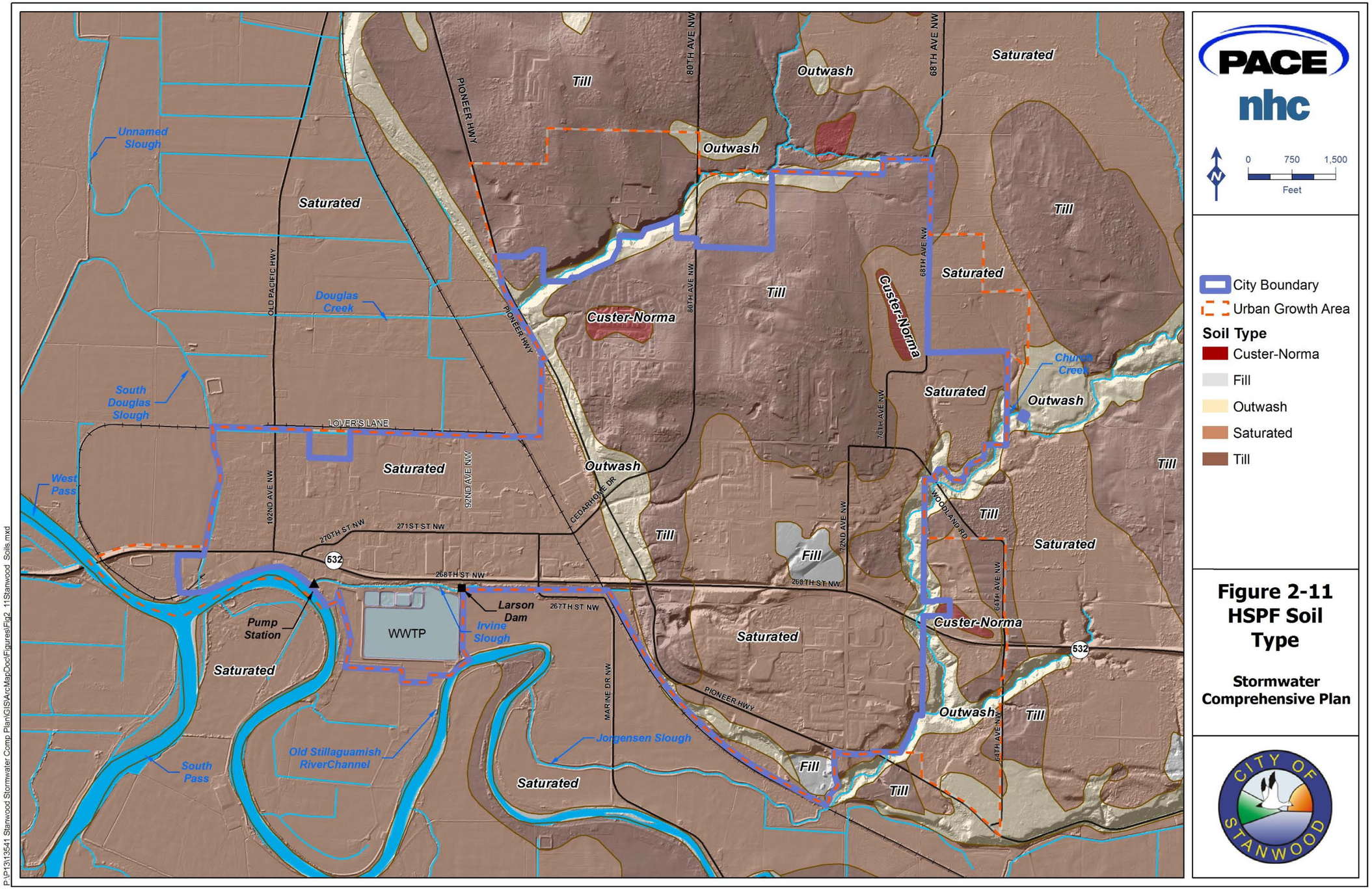

Figure 2-11
HSPF Soil Type

Stormwater Comprehensive Plan

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CHAPTER 3
REGULATORY REQUIREMENTS

3.1 INTRODUCTION

This chapter describes the various regulatory requirements and guidance documents that play a role in shaping both the form and content of the City's existing and future Stormwater Management Program (SWMP). These requirements include various federal, state, regional, and local regulatory requirements, laws, permits, and technical guidance documents that help define the City's various stormwater-related policies, codes, and activities. For the purpose of writing this chapter, the requirements have been grouped by their origin: federal, state, regional, and local. The City's stormwater-related regulatory requirements include compliance with the following:

Federal Laws, Permits, and Requirements

- Clean Water Act *(as administered by the Washington State Department of Ecology)*
  - Western Washington National Pollutant Discharge Elimination System Program (City's future NPDES Permit)
  - State 303d List and TMDL (Total Maximum Daily Loads)
  - Section 404 Permits (as administered by the U.S. Army Corps of Engineers)
- Endangered Species Act *(as administered by the Washington State Department of Ecology)*

State Laws, Permits, and Requirements

- Growth Management Act
- Department of Fish and Wildlife Hydraulic Code

Regional Laws, Permits, and Requirements
(as administered by special purpose agencies and districts)

- Puget Sound Action Agenda
- Regional Watershed Planning (WRIAs)
- Stillaguamish Watershed Council
- Stillaguamish River Clean Water District and Shellfish Protection
- Stillaguamish River Flood Control
- Drainage Diking District 7

Local Laws, Permits, and Requirements
(as administered by the City)

- City of Stanwood Stormwater Codes
- City of Stanwood Critical Areas Regulations

3.2 FEDERAL LAWS, PERMITS, AND REQUIREMENTS

3.2.1 The Clean Water Act

The 1972 amendments to the Federal Water Pollution Control Act, also known as the Clean Water Act (CWA), provide the regulatory and legal basis for the National Pollution

Discharge Elimination System Permit (Permit). The CWA includes a series of regulatory guidance documents, permits, and technical requirements to protect the water quality in the United States. The Federal Environmental Protection Agency (EPA) provides the basic structure for regulating the discharge of pollutants from point sources to waters of the United States through the NPDES Permit. The CWA allows EPA to authorize the NPDES Permit Program to be delegated to the Washington State government (specifically the Department of Ecology) for administration and enforcement of the Permit and associated TMDL water quality violations. The Permit applies to both industrial and municipal stormwater discharges. The specific purpose of the Permit is to reduce stormwater runoff and the discharge of pollutants into our nation's receiving waters.

Due to its size and relatively remote location, the City of Stanwood is not yet required to be under a Permit. However, the City's Stormwater Management Program (SWMP) does need to address the requirements of the 303d degraded water quality listings of Irvine Slough and Jorgenson Slough (Church Creek). The City also comes under the regulatory arm of the U.S. Army Corps of Engineers in regard to Section 404 permits and the State Department of Fish and Wildlife in regard to Hydraulic Project Approvals (HPAs) related to streams, habitat, water quality, and wetland protection during construction and maintenance projects within the City.

Western Washington National Pollutant Discharge Elimination System Program
(As administered by the State of Washington, Department of Ecology)

Cities of a certain size and development density that own and operate a stormwater collection/conveyance system, referred to as Municipal Separate Storm Sewer System (MS4), are required to meet the requirements of the Permit, as defined for Western Washington by the Department of Ecology. The origin of the Permit is the Federal CWA, as amended in the mid-1990s to include non-point sources of pollution that include stormwater and surface water runoff. Under federal and state law, municipalities that collect stormwater runoff in separate storm sewers and discharge to surface waters are required to have this Permit. This Permit is regulated by the EPA and locally implemented by the Washington State Department of Ecology through the EPA delegation process. Most states in the Northwest, except for Idaho and Alaska, have assumed the delegation of the Permit from EPA at the state level.

The EPA stormwater regulations are administered through a two-phase Permit program: Phase I for large cities and counties, and Phase II for smaller cities. The Department of Ecology has been delegated this authority to develop and administer these Permits throughout Washington State. The EPA regulations went into effect in early 2003 and apply to all cities, counties, and ports with regulated stormwater collection/conveyance systems.

For the State of Washington, the Department of Ecology has established separate permits, one for Eastern Washington and one for Western Washington; each permit has a duration of

five years. Ecology first issued the Western Washington Phase II Permit in 2007 and modified it in 2009. Ecology extended and reissued the 2007-2012 Permit on August 1, 2012, at legislative direction, to be effective through July 31, 2013. After an extensive public process, Ecology then reissued the updated 2013-2018 Permit on August 1, 2012, effective August 1, 2013. Ecology recently issued the new Permit, effective August 1, 2013, to over 80 cities and the urbanized areas within five counties in Western Washington.

Note that due to its smaller size in terms of population, less dense urban development, and its relatively rural location, the City of Stanwood is not currently required to operate its municipal stormwater system under a NPDES Municipal Phase II Permit; however, a Permit could be issued to the City as early as 2018.

303d List and Total Maximum Daily Loads

(As administered by the State of Washington, Department of Ecology)

The CWA requires all states to protect and restore their waters to be "fishable and swimmable." Section 303d of the CWA establishes a process to identify and clean up polluted waters by measuring and listing polluted bodies of water. Every two years, the State of Washington is required to perform a water quality assessment of the quality of surface waters throughout the state, including all streams, rivers, lakes, and marine waters. Ecology compiles its own water quality data using appropriate scientific methods predetermined by EPA.[1]

This Washington State Water Quality Assessment, developed by the Department of Ecology, lists the status of the water quality for each water body in the State using the relative Categories of 1 through 5, with Category 5 being the most degraded. Category 5 represents water bodies listed on the EPA's 303d list. Table 3-1 provides a listing of the 303d-listed water bodies into which the City of Stanwood discharges its stormwater.

The water quality parameters that the Department of Ecology has found to be exceeded near and within the City of Stanwood include fecal coliform bacteria, dissolved oxygen, and pH. These types of water quality problems are common within developed watersheds that have mixed land uses, such as Stanwood. Existing land uses in and around Stanwood include industrial, commercial, and residential, as well as livestock rearing, and crop production. The nature and extent of the water quality problems can be further degraded at the local level by elevated water temperatures and reduced flows that most typically occur during the summer months. Due to the diverse and pervasive nature of pollution sources, and the difficulty in controlling the sources or treating the water to remove these contaminates, these water quality parameters have proven to be difficult for the Department of Ecology to regulate, and especially difficult for most municipalities to control.

[1] http://www.ecy.wa.gov/programs/wq/303d/introduction.html

Table 3-1: 303d-Listed Water Bodies in the City of Stanwood[2]				
Water Body Listing ID #	**Name**	**Parameter**	**Medium**	**Category**
43042	Irvine Slough	Bacteria	Water	5
47617	Irvine Slough	Dissolved Oxygen	Water	2
7202, 7204, 7205, 7206	Jorgenson Slough (Creek Church)	Bacteria	Water	4A
7238, 7239, 7240, 40903, 47598	Jorgenson Slough (Creek Church)	Dissolved Oxygen	Water	2, 5
40901, 50866, 50867, 50869	Jorgenson Slough (Creek Church)	pH	Water	1, 5
53200, 7170, 7171, 7172, 7173, 53165, 53166, 53197	Skagit Bay	Bacteria	Water	5
8230, 14640, 14642, 14639	Old Stillaguamish Channel	Bacteria, DO, Temp., Ammonia	Water	4a, 2, 1

The Federal Clean Water Act shows the Stillaguamish River, Irvine Slough, and South Skagit Bay as having elevated concentrations of these pollutants. As a result, all three of these regional water bodies have been put on the State's most recent 303d water quality list. Being located directly adjacent to Irvine Slough, which directly discharges into the Stillaguamish River, the City's drainage discharges may impact the water quality of the river, as well as Skagit Bay and Puget Sound.

The Stillaguamish River is also 303d-listed for temperature. This is often caused by lack of a combination of riparian vegetation, change in stream morphology, and/or change in hydrology. Elevated temperatures in receiving waters, combined with manmade sources of pollution, threaten aquatic species both within the streams and within other downstream reaches of the natural drainage system. In general, high temperatures can be a major contributor to overall low health for a river system, such as within the lower reaches of the Stillaguamish River.

Irvine Slough, Jorgenson Slough, and South Skagit Bay are 303d-listed because of bacterial pollutants, mainly fecal coliform (FC), high sediment levels, and low dissolved oxygen. Elevated levels of fecal coliforms are harmful to both humans and aquatic life when in high enough concentrations. These pollutants, along with elevated temperature, have contributed to the closing of many acres of commercial and public shellfish harvesting grounds within adjacent shellfish rearing areas.

The natural resources of the Stillaguamish River are unique and important to the local economy and the quality of life in and around the City of Stanwood. Given that such an important resource is currently being threatened, substantial resources have been and continue to be invested in sustaining and enhancing the health of the river, resulting in the initiation of numerous surveys and technical assessments.

[2] https://fortress.wa.gov/ecy/wqamapviewer/default.aspx?res=1613x1008

The Stillaguamish River Clean Water District, discussed in Section 3.4.4, was specifically organized in response to the elevated coliform concentrations in and downstream of the Stillaguamish River. In addition, several studies and reports have been conducted in regard to water quality, habitat health, shellfish and the TMDLs for the Stillaguamish River and the Skagit Bay. Several of the most current and significant studies are presented below:

- Skagit Bay Fecal Coliform Bacteria Loading Assessment, By Washington Department of Ecology https://fortress.wa.gov/ecy/publications/summarypages/1203035.html (June 2012)
- Stillaguamish River Watershed Temperature TMDL Study http://www.ecy.wa.gov/programs/wq/tmdl/StillaguamishTMDL.html (March 2004)
- Stillaguamish Watershed Action Plan http://www.co.snohomish.wa.us/documents/Departments/Public_Works/SurfaceWaterManagement/Watershed/StillyWatershedActionPlan19901.pdf (1990)
- Focus on Next Steps to Improve Water Quality in the Stillaguamish Watershed and Port Susan (April 2007) https://fortress.wa.gov/ecy/publications/SummaryPages/0710035.html
- Stillaguamish River Watershed Fecal Coliform, Dissolved Oxygen, pH, Mercury, and Arsenic Total Maximum Daily Load Study (July 2004) https://fortress.wa.gov/ecy/publications/SummaryPages/0403017.html
- Stillaguamish River Watershed Fecal Coliform, Dissolved Oxygen, pH, Arsenic, and Mercury Total Maximum Daily Load (May 2005) https://fortress.wa.gov/ecy/publications/SummaryPages/0510044.html

For additional reports and studies, see the Washington Department of Ecology website.

Section 404 Permits

(As administered by the U.S. Army Corps of Engineers)

Section 404 of the CWA establishes programs to regulate the discharge of dredged and/or fill material into the waters of the United States, including wetlands. Projects and activities that are included under this regulation include water resource projects, infrastructure development, and mining operations. This section of the CWA is regulated by the U.S. Army Corps of Engineers (Corps).

The Corps authorizes activities by issuing individual and general permits for construction and habitat enhancement projects. Under Section 404, individual permits include Standard Individual Permits and General Permits, including the Nationwide Permits and Regional General Permits. The Corps determines which type of permit is needed based on the type of activity and potential impacts to the environment. A Corps permit can include authorization under Section 10 and/or Section 404. Typical activities that may require Section 404 permits are:

- Depositing fill, dredged, or excavated material in waters of the U.S. and/or adjacent wetlands.
- Grading or mechanized land clearing of wetlands.
- Placing spoils from ditch excavation into wetlands.
- Moving soil during vegetation clearing into wetlands.
- Depositing fill for residential, commercial, or recreational site developments.
- Constructing revetments, groins, breakwaters, beach enhancements, jetties, levees, dams, dikes, or weirs.
- Placing riprap and road fill.

3.2.2 Endangered Species Act

(As administered by the U.S. Department of Fish and Wildlife and the Washington Department of Ecology)

In 1973, the United States Congress passed the Endangered Species Act (ESA) with the purpose of protecting and recovering imperiled species and their supporting habitat ecosystems. ESA is administered by the U.S. Fish and Wildlife Service (FWS) and the Commerce Department's National Marine Fisheries Service (NMFS). The FWS is responsible for terrestrial and freshwater organisms, while the NMFS is responsible for marine wildlife such as salmon. Within the State of Washington, the Department of Fish and Wildlife works closely with federal agencies in administering the ESA at the local level. Most projects requiring ESA-related permitting are jointly permitted by both federal and State agencies, often using a common permit.

Portions of the natural and manmade drainage systems within the City of Stanwood fall under the jurisdiction of the ESA and are subject to regulation by both federal and State agencies. These waters include the City's discharges to the South Douglas Slough area (from Douglas Creek), and Irvine and Jorgenson Sloughs (from Church Creek).

- The Jorgenson Slough has instances of the following listed fish species being observed and reported: Resident Coastal Cutthroat (documented), Fall Chinook (modeled presence), Fall Chum (documented), Coho (documented), Dolly Varden/Bull Trout (presumed presence), Pink–Odd Year (modeled presence), and Winter Steelhead (documented).
- The South Douglas Slough is considered viable habitat to support the following anadromous fish species: Fall Chinook, Fall Chum, Coho, Pink–Odd Year, and Winter Steelhead.

Within Washington State, including the Stanwood area, the following species are also listed as species of concern with either State or federal agencies: Bull Trout, federally threatened

and a candidate for state listing; Chinook salmon, federally listed; Coho, federally threatened; and Steelhead, federally threatened.[3]

3.3 STATE LAWS, PERMITS, AND REQUIREMENTS

3.3.1 Washington State Growth Management Act

The City is currently updating its Comprehensive Plan under the guidance of the Washington State Growth Management Act (GMA). This citywide planning effort includes land use, economic development, transportation, housing, capital facilities, natural features, parks, and utilities. It also includes the regional planning objectives adopted through the Puget Sound Regional Council Vision 2040, the Snohomish County Countywide Planning Policies in 2012, and the City's local environmental and economic objectives and policies. The updated Comprehensive Plan is required to address a period of at least 20 years into the future and will include the results of this SCP, along with the results of the City's concurrent water supply, wastewater, and transportation comprehensive planning efforts. One of the primary objectives of the Comprehensive Plan is to anticipate and plan for the infrastructure needs of future growth before the growth occurs. This process allows for effective planning, design, and funding of the City's future utilities and infrastructure.

3.3.2 State Department of Fish and Wildlife

(Hydraulic Project Approval – HPA)

The Washington Department of Fish and Wildlife (WDFW) administers and enforces the Washington State Hydraulic Code and its associated Hydraulic Project Approval (HPA) Permit. The purpose of this the program, and its associated HPA Permit, is to protect the State's fisheries resources, including spawning and rearing habitats for returning fish. A HPA Permit must be obtained from WDFW before work is conducted that uses, obstructs, diverts, or changes the natural flow or bed of any of the State's bodies of water. The permit usually applies to work being conducted within the normal high water mark of streams and associated tributaries.

3.4 REGIONAL LAWS, PERMITS, AND REQUIREMENTS

3.4.1 Puget Sound Action Agenda

(As administered by the State of Washington)

In 2007, the Puget Sound Partnership (Partnership) was requested by the State Legislature to coordinate a regional effort to clean up the water quality of Puget Sound.

[3] Washington Department of Fish and Wildlife, http://wdfw.wa.gov/conservation/endangered/list/Fish/ <accessed May 15, 2014>

The Partnership wrote the 2012/2013 Puget Sound Action Agenda (Action Agenda) that identifies one major priority, Priority C, that is relevant to Stanwood. Priority C applies to *Reducing and Controlling the Sources of Pollution in Puget Sound,* and includes the following activities which are relevant to the City's SWMP:

- C-1: Prevent, reduce, and control the sources of toxic contaminants entering Puget Sound.
- C-2: Use a comprehensive approach to manage urban stormwater runoff at the site and landscape scales.
- C-3: Prevent, reduce, and control agricultural runoff.
- C-4: Prevent, reduce, and control surface runoff from forest lands.
- C-5: Prevent, reduce, and/or eliminate pollution from decentralized wastewater treatment systems.
- C-6: Prevent, reduce, and/or eliminate pollution from centralized wastewater systems.
- C-7: Promote abundant, healthy shellfish for ecosystem health, for commercial subsistence, and recreational harvest consistent with ecosystem protection.
- C-8: Effectively prevent, plan for, and respond to oil spills.
- C-9: Address and clean up cumulative water pollution impacts in Puget Sound.

The Partnership typically identifies and implements the reduction of pollutants into Puget Sound by working with and through local implementation organizations, such as the Stillaguamish Watershed Council and associated regional planning efforts, such as WRIA 5.

3.4.2 Water Resource Inventory Area 5 – Stillaguamish Watershed

(As administered by the State of Washington)

The Stillaguamish Watershed has been established by Ecology as Water Resource Inventory Area 5 (WRIA 5). As shown on earlier maps, the Stillaguamish watershed is situated in the central part of the Puget Sound basin. It is comprised of the northwestern part of Snohomish County, including the City of Stanwood, and the south central part of Skagit County. WRIA 5 has a total of 685 square miles and encompasses 27 sub-watersheds and numerous creeks. On its west side, it is bounded by Puget Sound, and on its east side it is defined in its upper reaches by the Cascade Mountain range. The majority of water in the Stillaguamish Watershed is already legally spoken for or "appropriated," in terms of available water rights. Increasing demands for water from ongoing population growth, declining groundwater levels in some areas, and the impacts of climate change, have put Washington's water supplies at risk, particularly during the summer months. See Figure 3-1 for the location and extent of WRIA 5.

The Revised Code of Washington (RCW) Chapter 90.82 sets the requirements for watershed planning within the State of Washington and requires the setting of goals for appropriating natural existing water supplies within the state's Water Resource Inventory Areas (WRIAs).

This state code provides a framework and resources for local governments to develop solutions to watershed issues on an individual watershed basis. The resulting watershed plans, developed through a watershed wide prioritization and planning process, are required to address water quantity, with the optional elements of water quality and habitat. Some plans also include flood control elements. WRIA 5 has an in-stream flow and management rule (WAC 173-505) to protect senior water rights, maintain a healthy ecosystem, and meet future water resource management objectives. Such rules are required by state law (RCW 90.54). WAC 173-505 also establishes maximum allocation limits on certain rivers, at certain times, to preserve the environmental benefits of natural annual high flows. A copy of the August 2012 Focus Sheet, presented in Appendix A.4, describes information about the availability of water within the Stillaguamish Watershed.

3.4.3 Stillaguamish Watershed Council

The Stillaguamish Watershed drains approximately 685 square miles of Snohomish and Skagit Counties. Early staples of the economy of the Stillaguamish Watershed were forestry and farming, along with fishing and shellfish harvesting, and all of these economic activities still remain vital pieces of the local economy and recreational pursuits.

The Stillaguamish Watershed Council collaboration began in early 1990 between local stakeholders, including the City of Stanwood, Snohomish County, the Tulalip and Stillaguamish Tribes, farmers, forest landowners, citizens, and local agency representatives. To be a viable member of the Council, each group must be committed to the goal of improving local water quality. The City of Stanwood continues to participate on a regular basis in the efforts of the Stillaguamish Watershed Council and has been an active supporter since its inception.

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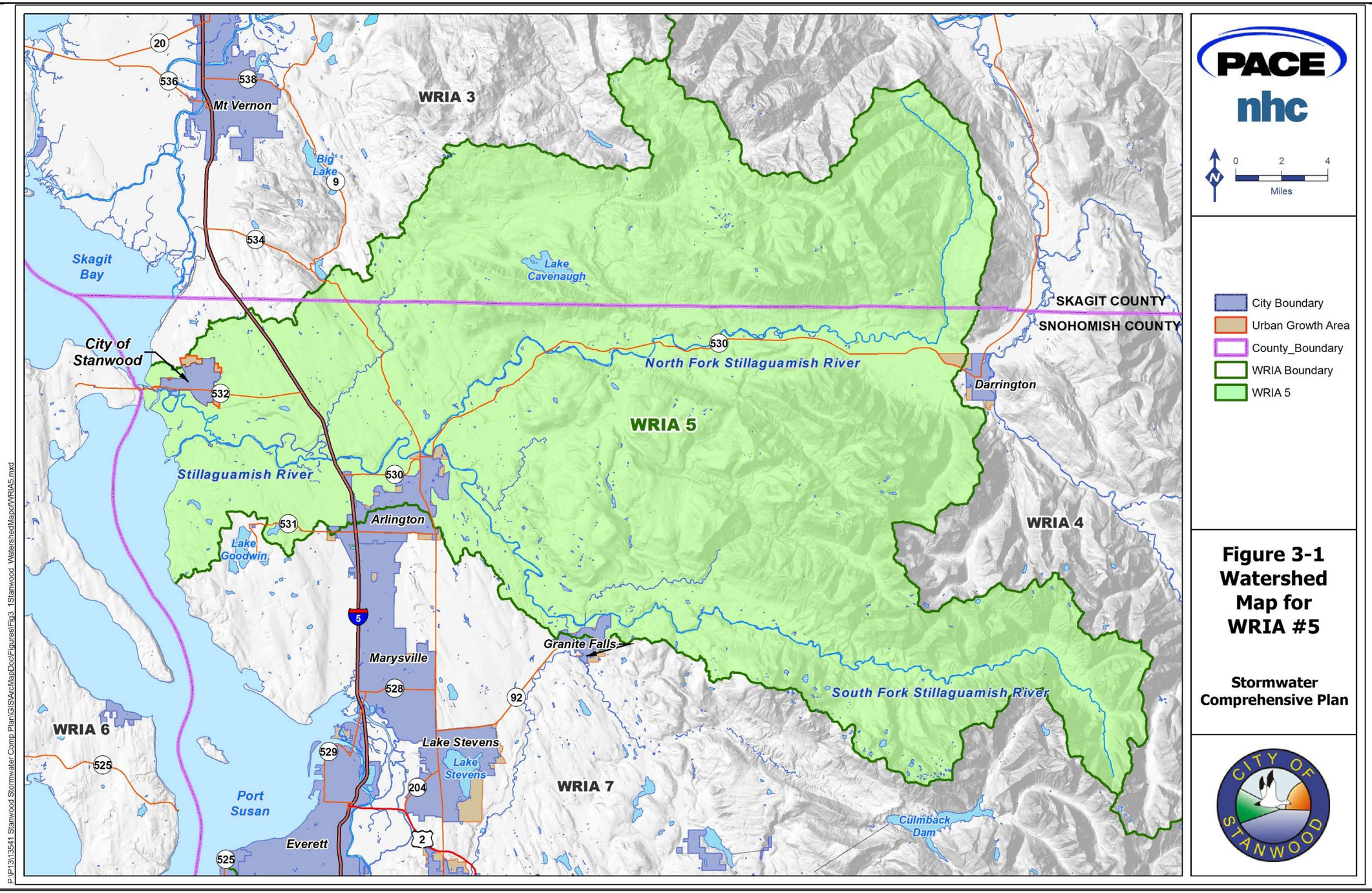

Figure 3-1 Watershed Map for WRIA #5

Stormwater Comprehensive Plan

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3.4.4 Stillaguamish River Clean Water District

The Stillaguamish River Clean Water District (CWD) was formed in response to the closure of over 6,000 acres of commercial and public shellfish fishing grounds in 1987 within Skagit Bay. This critical shellfish rearing area is fed by discharge flows from both the Stillaguamish and Skagit Rivers. The reason for the closure was elevated coliform levels within local and regional shellfish rearing areas. These elevated concentrations are believed to be due to high levels of bacteria coming from upstream practices that include agriculture, onsite sewage disposal, urban runoff, and forestry. Every year the CWD collects a fee from each property owner which is used for education of citizens in the Stillaguamish Watershed and to fund restoration projects to improve the water quality within the Stillaguamish River and Skagit Bay. Figure 3-2 shows the current CWD boundaries. Currently, Stanwood and the Stillaguamish Flood Control District are not included in the CDW; however, the CDW is currently looking to amend their bylaws to include Stanwood. If included in the District, the City of Stanwood would be a very proactive and supportive participant.

An applicable study to Stillaguamish Shellfish health is below:

- Stillaguamish Shellfish Protection Program. By Snohomish County Public Works http://snohomishcountywa.gov/DocumentCenter/Home/View/7453 (March 2011)

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Source: Snohomish County

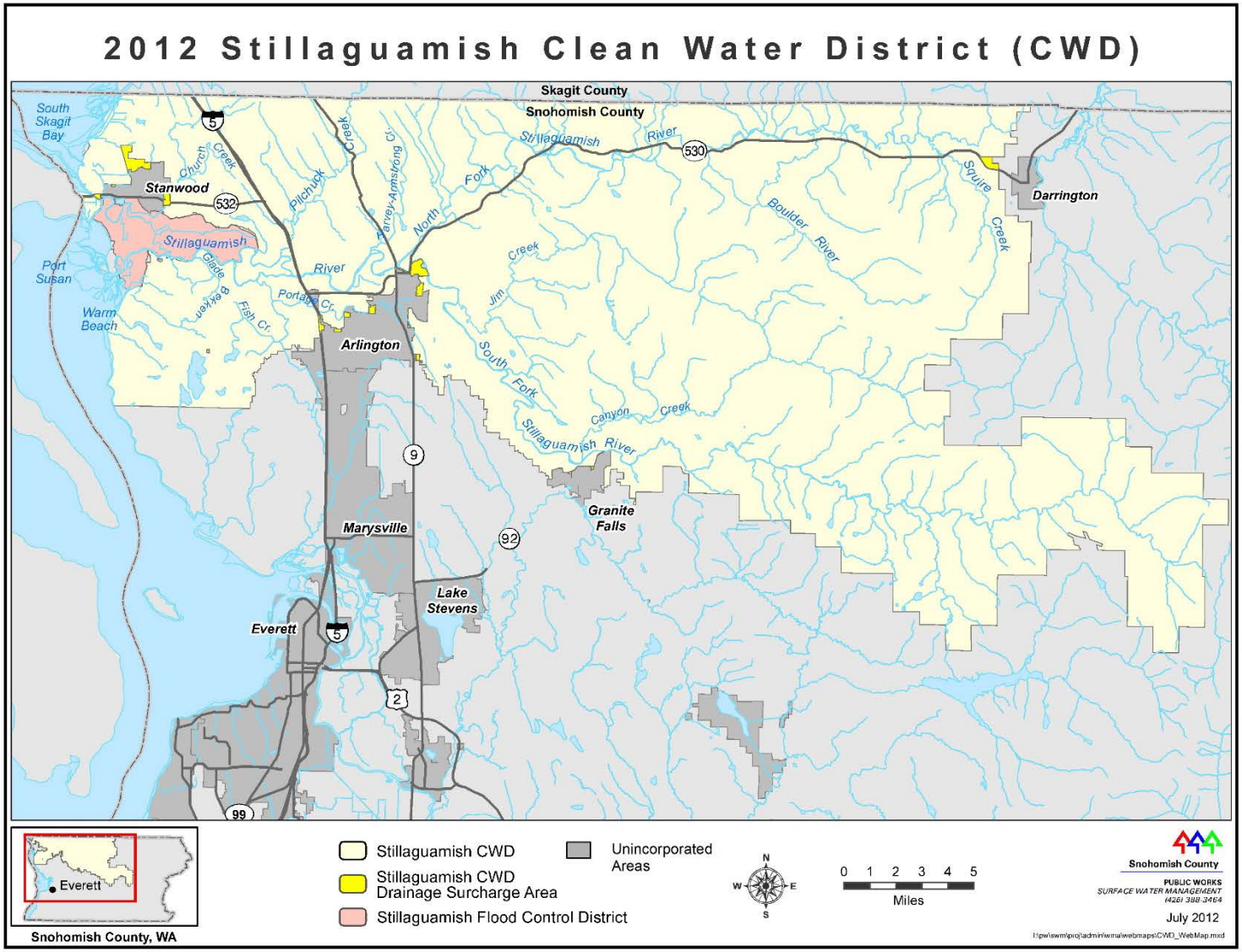

Figure 3-2
Stillaguamish CWD Boundaries

Stormwater Comprehensive Plan

P:\P13\13541 Stanwood Stormwater Comp Plan\GIS\ArcMapDoc\Figures\Fig3_2Stanwood_StillaguamishCWDBoundaries.mxd

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3.4.5 Stillaguamish Flood Control District and Diking and Drainage District #7

Being located in a floodplain, the drainage and flood control policies and facilities of the City of Stanwood are influenced by the policies and programs of Snohomish County and the three regional flood control/reduction districts. Figure 3-3 shows the jurisdictional boundaries of the City, the County and the three flood control/reduction districts that include the Stillaguamish River Flood Control District and Diking Districts #7 and #12.

3.4.5.1 *Stillaguamish Diking and Drainage District #7*

The Stillaguamish Diking and Drainage District #7 (DD7) was founded in the 1920s by a group of landowners to tax themselves on an annual basis to raise funds to preserve and maintain the dike along Skagit Bay, just north of the City of Stanwood. Later, other drainage responsibilities within the District were added to the tax assessment including preservation o drainage facilities like ditches, sloughs, and creeks, as well as to maintain the dike along the bay. Currently, DD7 taxes about 12,000 acres of land, of which 40-50 acres are within the city limits of Stanwood. The main drainage outlets are Douglas Creek, Irvine Slough, and the Unnamed Slough that catches the drainage from the northern part of the City and discharges it into the Stillaguamish River just west of the City. The annual assessment revenues collected from DD7 go towards mowing and cleaning ditches, rebuilding the dike, and maintaining the tide gates on both Douglas Creek and Irvine Slough.

3.4.5.2 *Stillaguamish Flood Control District*

The Stillaguamish Flood Control District (SFCD) lies just to the south of Stanwood and works with the City on adjoining flood control and stormwater runoff reduction-related issues. Founded in 1993, the SFCD was formed to protect property and life from flooding within the lower reaches of the Stillaguamish River. The assessments collected within this jurisdiction go towards maintaining levees and drainage facilities, as well as improving some water quality issues, and periodic water quality monitoring. The SFDC has worked with the City in the past to install a flood relief structure, the Larson Dam, as shown in many of the previous facility maps, and as presented in Figure 2-5 Stormwater Facility Inventory in Chapter 2 on page 2-17.

DD7 and SFCD are working with the Stillaguamish Tribe and the City in developing collaborative enhancements to relieve the current capacity issues that occur within Irvine Slough during high flow/rainfall events. This regional flood reduction effort is scheduled to start sometime later this year.

3.5 LOCAL LAWS, PERMITS, AND REQUIREMENTS

3.5.1 City of Stanwood Municipal Code[4]

The Stanwood Municipal Code (SMC) Chapter 17.140: Stormwater Management Performance Standards codifies the City's stormwater requirements for new development and redevelopment. This section of the SMC provides the minimum stormwater standards required for all properties being developed or redeveloped within the City under the 2005 Department of Ecology's Stormwater Management Manual for Western Washington (SWMMWW).

In addition, stormwater is addressed in Chapter 3 of the City Street and Utility Standards as well as in the following sections of the City's various municipal codes:

- SMC Title 17: Zoning
- SMC 17.114: Critical Areas – General Provisions
- SMC 17.115: Critical Areas – Geologically Hazardous Areas – Specific Standards
- SMC 17.20: Construction of Language – Definitions
- SMC 17.78: Mineral Resource Lands Special District

3.6 REGIONAL INTERLOCAL COOPERATION

The City of Stanwood has entered into three different agreements at this time to join with other neighboring and upstream communities in addressing stormwater runoff and managing flows from major flood/rainfall events. These agreements are summarized below and include an agreement with the Stillaguamish Tribe for watershed and habitat enhancements, an agreement with Diking District #7 (DD7) for flood management and reduction, and an agreement with Snohomish County for stormwater facility maintenance. Additional details for each agreement are presented below and copies of each agreement are included in Appendix A.

3.6.1 Memoranda of Understanding (MOU)

3.6.1.1 *Diking District #7 (Appendix A.5)*

The City has entered into an agreement with the DD7 to help manage the common problem of flooding north of the City that enters into agricultural fields from Douglas Creek and often flows southward into the downtown area of the City. Once the excess water enters the City, it ultimately drains via gravity under State Highway 532, enters Irvine Slough, and is pumped into the lower reaches of the Stillaguamish River, just prior to the river flowing into Puget Sound.

[4] http://www.codepublishing.com/wa/stanwood/

3.6.1.2 *Snohomish County for Retention/Detention (R/D) Pond Maintenance (Appendix A.6)*

The Memorandum of Understanding (MOU) with Snohomish County provides the City an extension of City resources in the form of staff and equipment for maintaining the 24 or more regional detention facilities that currently lie within the City. Most of these facilities serve some of the newer developments within the City that lie on the hillside located east of downtown, and east of the railroad tracks, across Pioneer Highway.

3.6.2 Interlocal Agreements

3.6.2.1 *Stillaguamish Tribe for Watershed Improvements (Appendix A.7)*

In this interlocal agreement with the Stillaguamish Tribe, the City and Tribe mutually agree to support, participate in, and fund projects that reduce damage from flooding. One of the objectives of the interlocal agreement is to promote projects that are aimed at preserving and enhancing natural habitat areas and functions within and adjacent to the lower reaches of the Stillaguamish River.

3.6.2.2 *Irvine Slough Stormwater Separation Study*

Currently, a large regional study is being planned with some funding that has been provided by the federal Environmental Protection Agency (EPA). This particular study, the Irvine Slough Stormwater Separation Study, will focus on ways to dewater the downtown area of the City during major flood/rainfall events. The current system of gravity flow to Irvine Sough is difficult to maintain due to excessive water coming from the south, through Larson Dam, and filling in the slough; this leaves little time to draw down the slough to allow gravity flow under SR 532 to reach Irvine Slough. It is also possible to get reverse flows into the City depending on tidal functions and system operations. Additional capacity is needed north of SR 532, and this study will focus on creating and evaluating alternatives to provide this type of dewatering relief to the inner City. The study is scheduled to start later in 2014.

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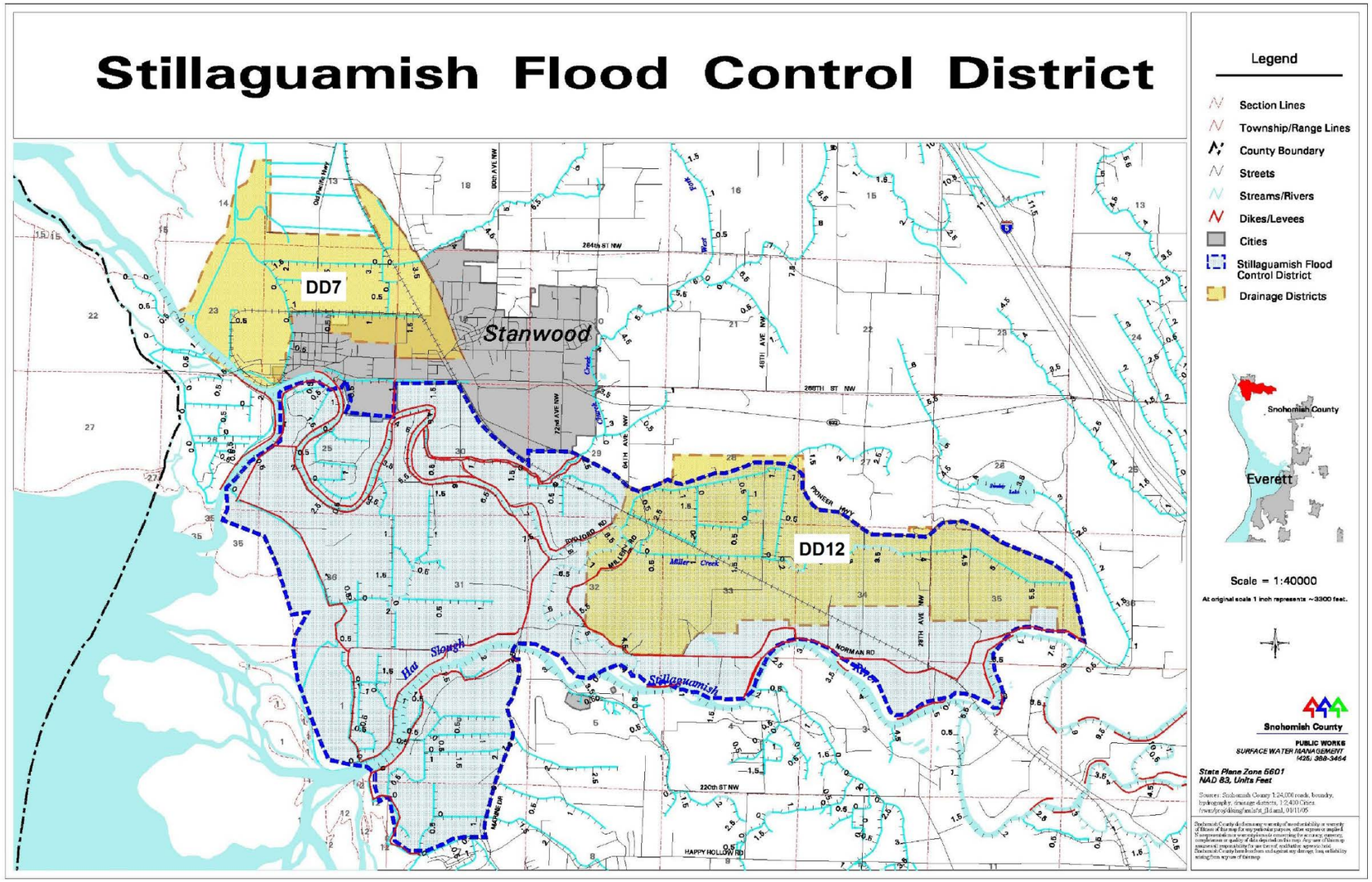

Source: Snohomish County

Figure 3-3
Flood District Boundaries

Stormwater Comprehensive Plan

P:\P13\13541 Stanwood Stormwater Comp Plan\GIS\ArcMapDoc\Figures\Fig3_3Stanwood_FloodDistrictBoundaries.mxd

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CHAPTER 4
OPERATION AND MAINTENANCE PROGRAM

4.1 INTRODUCTION

Chapter 4 provides an overview of the City's stormwater Operation and Maintenance Program (O&M), equipment activities, and costs. Drainage facility maintenance is one of the most essential components of an effective Stormwater Management Program (SWMP). Stormwater facilities require regular inspection, cleaning, and repair to ensure that they are functioning as intended in order to provide the required flow control, water quality treatment, detention, and conveyance. An effective O&M Program aims to protect public health and safety, maintain drainage system integrity and function, reduce infrastructure repair and life cycle costs, enhance water quality, and achieve future regulatory compliance.

An effective Operation and Maintenance Program aims to protect public health and safety, ensure drainage system integrity and function, reduce infrastructure repair and life cycle costs, enhance water quality, and achieve future regulatory compliance.

Both roadway and non-roadway areas contribute excess stormwater runoff, sediment, and pollutants to the City's stormwater drainage system; the system also receives excess runoff from adjacent State and County roads and County lands. Providing regular maintenance is one of the best, most cost-effective ways to realize the capacity that has been designed into the City's drainage system. It is this optimization of the existing capacity that allows the City to both reduce flooding and property damage, as well as control and remove sediments and other contaminants from the system and from entering into local receiving waters.

Upon issuance of an NPDES Phase II Permit, the City will be required to develop a specific annual O&M Program, map and inventory the system and its outfalls, provide routine facility performance inspections, conduct and record O&M activities within specific timeframes and according to the predetermined methodologies/standards of a future Permit, and routinely conduct annual maintenance functions, including facility cleaning, repair, and replacement.

4.2 DESCRIPTION OF THE CITY'S ANNUAL SWM OPERATION AND MAINTENANCE PROGRAM

4.2.1 Annual Operation and Maintenance Program – Overview of Services

The City currently implements a number of stormwater maintenance practices on an annual basis. Generally, these annual services include the cleaning, repair, and replacement of the City's various stormwater related facilities including ditches, pipes, catch basins, ponds, and regional detention facilities. The maintenance crews are also often called upon by citizens, businesses and property owners to respond to localized drainage problems that are threatening public and private roads, homes, businesses, and other structures.

Activities and aspects of the City's annual stormwater O&M Program include:

- The City runs an efficient and effective annual O&M that is tailored to the unique characteristics of the drainage system.
- The City maintenance crew prides itself in being responsive to the public and in protecting local businesses and infrastructure by often responding around the clock during major storm events.
- The City has adopted the 2005 Ecology Manual, but has not yet developed a written annual O&M Program or set of standards to support its annual operating budget, staffing and equipment needs.
- The City's major structures, such as tide gates and pump stations, are inspected at least twice annually; some of the most critical facilities are routinely inspected during heavy rains, such as the Larson Dam, and the Irvine Slough and its pump station, along with other known problem areas located throughout the City.
- All catch basins and stormwater conveyance pipes are cleaned and inspected at least once every two years by an outside contractor.
- The City has entered into an Interlocal Agreement (ILA) with Snohomish County for maintenance work that has historically included specialized road maintenance activities, as well as the maintenance of the City's detention ponds.
- Public Works staff are industrious, capable, and creative; they have been trained on operating the City's sweeper and vactor equipment; however, they have had no formal training on detention/retention pond maintenance, water quality BMPs operation or how to maintain/replace the various types of new low impact development (LID) facilities, which are now required in Ecology's most recent Permit.
- The Public Works Department uses the iWorQ[1] work order system for managing work flow and passing out work assignments to the various crew members on a weekly and daily basis.
- Interagency coordination with adjacent agencies is an important part of the City's annual maintenance program and includes shared activities and costs with the tribes, flood control and diking districts, the County and a number of regional watershed shellfish and water quality enhancement associations.

4.2.2 Core Operation and Maintenance Program Goals and Objectives

The goals of the City's stormwater O&M Program are to:

- Maintain the proper function of each of the City's stormwater facilities in order to realize the full design capacity of the existing facilities.
- Interact and have a positive exchange with the community by conducting effective and responsive maintenance and repair activities.

[1] iWorQ is a company that offers city and county government management applications as an Internet service, not as installed software. http://www.iworq.com/

- Effectively respond to public drainage complaints by performing small works projects or minor improvements using O&M crews, and identifying and recommending larger projects for capital design, funding, and construction.
- Reduce particulate and pollutant loading into the conveyance system and local receiving waters, such as Irvine Slough.
- Establish a plan that outlines how the City's O&M Program can begin to reverse itself from being mostly reactive to becoming more proactive in conducting its annual maintenance program and anticipating future maintenance, staffing, equipment, and facility repair/replacement needs.

4.2.3 Stormwater Facility Inventory and Mapping

An accurate stormwater inventory, developed in a GIS geodatabase, is a key development and implementation tool for an effective O&M Program. Once created, an O&M Program geodatabase needs to be updated and expanded in order to ensure it is always complete, up to date, and accurate. This is the type of stormwater investment that will always pay off. It is also an invaluable staffing and budget management tool, as the inventory and mapping network can be routinely used to plan the sequencing of O&M activities, create daily work orders for the crews, and support annual staffing, equipment, and budget requests. The uses of an up-to-date stormwater facility inventory and mapping system are numerous and may include the following:

- Asset management
- Recordkeeping
- Support to the annual budget processes
- Quick response to citizen and City Council requests
- When under a Permit, an up-to-date map of stormwater facilities supports compliance by providing the information needed for the development of an annual report to Ecology

Note that descriptions of various aspects of the City's stormwater and drainage system are presented in Chapter 2 – Planning Area Stormwater Characteristics, Chapter 5 – Stormwater System Hydrologic and Hydraulic Modeling, and Chapter 6 – Development of the Capital Improvement Program.

4.2.4 City's Major Stormwater Operation and Maintenance Services

The City's annual O&M Program is executed by routinely conducting the following activities and services, as listed and discussed below:

- Complaint response
- Annual maintenance
- Facility repair/replacement
- Waste disposal

4.2.4.1 O&M Service #1 – Complaint Response

The City's current O&M Program is responsible for receiving and responding to public complaints. Drainage concerns are documented and responded to as quickly as possible, with public requests being immediately passed on to the maintenance supervisor for response. The City's maintenance crew also currently responds to illicit discharges and spills, as reported to the City or observed by City Staff. Responses to water quality concerns and spill reports have recently become part of the City's emerging Illicit Discharge Detection and Elimination Program, and will be required under the City's future Permit.

4.2.4.2 O&M Service #2 – Routine Annual Maintenance Activities

The City's annual stormwater O&M Program includes a variety of activities including: ditch, pipe, and catch basin cleaning; vegetation trimming and removal; ditch reshaping and sediment removal; inspections to insure proper performance; observation of construction and redevelopment activities; response to spills; retention pond maintenance; interlocal agreements with the County, Stillaguamish Tribe, and Diking/Drainage District for pond and SWM facility maintenance and coordination for flood reduction; removal and replacement of broken or worn out parts; and equipment repair and maintenance. In general, the City's annual SWM O&M Program includes whatever is needed to protect public safety and properties and keep the drainage system functioning properly.

4.2.4.3 O&M Service #3 – Facility Repair and Replacement

During the routine investigation and maintenance of the City's drainage facilities, City crews will often run across parts of the system that are broken or not working properly and need to be fixed in the field or even replaced. Most of these types of facility repairs and replacements can be easily addressed by the crews themselves. The larger problems are usually referred to the Public Works Director and placed on the City's stormwater CIP list for formal design and construction, as funding becomes available. Having a crew that is both knowledgeable and capable of these types of repairs is invaluable to the City and can annually save the City considerable financial resources.

4.2.4.4 O&M Service #4 – Waste Handling and Disposal

An important part of having an effective maintenance program is also knowing how and where to safely dispose of collected waste materials and by-products. During maintenance there are a lot of urban sediments and some liquids that need to be disposed of properly. Most of these solid wastes are from catch basin, ditch, pipe, and pond cleaning, and vegetation removal. Although expensive, most solids are routinely picked up and disposed of by a waste management firm, with most wastes ultimately being safety disposed of in a certified landfill.

4.3 RESULTS OF REGULATORY COMPLIANCE GAP ANALYSIS FOR OPERATION AND MAINTENANCE PROGRAM

If the City were under a Permit, the annual O&M Program would be guided by a series of Permit-mandated activities, specified methodologies with defined due dates, and other O&M program requirements including a detailed annual report documenting completed O&M activities and their completion dates. This section summarizes the O&M requirements of a new Permit. It also summarizes the results of a regulatory gap analysis that was performed on the City's current annual Operation and Maintenance Program.

4.3.1 Future Permit Operation and Maintenance Program Requirements

Issuance of a Permit will require the City to implement additional municipal O&M Program activities including:

- Adoption of maintenance standards consistent with the 2012 Ecology Manual.
- Development and implementation of specified stormwater O&M standards, as defined in the Ecology Stormwater Manual for Western Washington and the Permit.
- Conducting annual inspections of City owned stormwater treatment and flow control facilities, and performing needed maintenance.
- Spot checking stormwater treatment and flow control facilities after major stormwater events (>10-year recurrence interval); conducting repairs.
- Inspecting all catch basins and inlets at least once every two years and conducting needed maintenance.
- Implementing maintenance practices, policies, and procedures to reduce stormwater impacts from the various types of land uses throughout the City.
- Regularly conducting training activities for all O&M staff and applicable City staff, whose primary job functions include drainage O&M and construction-related activities.
- Developing and implementing a Stormwater Pollution Prevention Plan (SWPPP) document for the Public Works/Maintenance Yard.
- Continuing to keep O&M records of all activities using iWorQ municipal management software.
- Reporting annual O&M to the Department of Ecology.

4.3.2 Compliance with a Future Permit for Operation and Maintenance Program: Results of Gap Analysis

Compliance with a future Permit requires performance of the following specific seven O&M activities, as shown in Table 4-1. The seven O&M activities include:

- Annual inspections
- Spot checks after storms
- Catch basin inspections and maintenance

- Road and non-road maintenance
- Training
- SWPPP for maintenance yard
- Recordkeeping

The results of the regulatory gap analysis performed on the City's annual O&M Program are summarized in Table 4-1 and show that, to be in compliance with a future Permit, the City will need to consider the following adjustments to their program.

- ***O&M Staffing:*** Increase staffing from 1.57 FTE to 3.05 FTE, an increase of 1.48 FTE ($168,927) annually (or retain the support of outside services).
- ***O&M Supplies/Expenses*:** Increase expenses for supplies and services from $42,500 to $95,500, an annual increase of $53,000.
- ***O&M Program:*** Increase total annual O&M costs from $179,385 to $401,312, an increase of $221,927 annually.

See Table 4-1 for a detailed comparison of recommended levels of staffing and costs for each of the major O&M program elements required upon issuance of a future Permit.

Table 4-1: Results of Regulatory Compliance Gap Analysis for City's O&M Program

Adoption Maintenance Standards (SWMP Element 5.1)	Existing Staff (FTE)	Existing Staff Costs ($)	Existing Expenses ($)	Total Existing Program Costs ($)	Future Staff (FTE)	Future Staff Costs ($)	Future Expenses ($)	Total Future Program Costs ($)
Annual Inspections of Water Quality and Flow Control Facilities (SWMP Element 5.2)	See bottom line total				0.10	$10,027	$0	$10,027
Spot Checks after Storm Events (SWMP Element 5.3)	See bottom line total				0.75	$75,200	$25,000	$100,200
Catch Basin Inspections (SWMP Element 5.4)	See bottom line total				0.40	$40,106	$15,000	$55,106
Road Maintenance/Non-Roadway Maintenance (SWMP Element 5.5)	See bottom line total				0.75	$75,200	$15,000	$90,200
Staff Training (SWMP Element 5.6)	See bottom line total				0.75	$75,200	$30,000	$105,200
SWPPP for Maintenance Yard (SWMP Element 5.8)	See bottom line total				0.10	$10,027	$5,000	$15,027
Record Keeping (SWMP Element 5.9)	See bottom line total				0.05	$5,013	$500	$5,513
Total	**1.57**	**$136,885**	**$42,500**	**$179,385**	**3.05**	**$305,812**	**$95,500**	**$401,312**
Total Gap					**1.48**	**$168,927**	**$53,000**	**$221,927**

4.3.3 Summary of Results of the Gap Analysis for Operation and Maintenance Program

Additional staffing (or outside services) and expenses will be needed in order for the City's annual O&M Program to come into compliance with a future Permit. Existing and future annual resources needed to implement new O&M Permit activities are listed below and are compared and contrasted with the City's existing staffing levels and costs of various services and equipment:

Existing O&M	Future O&M	Total Difference (Increase)
Staff (FTE) = 1.57 Staff Costs ($) = $136,885	Staff (FTE) = 3.05 Staff Costs ($) = $305,812	Staff Gap (FTE) = 1.48 Staff Gap Expense Costs ($) = $168,927
Expense Costs ($)=$42,500	Expense Costs ($) = $95,500	Gap in Expense Cost ($) = $53,000
Total Costs ($) = $179,385	Total Costs ($) = $401,312	Total Cost ($) Gap = $221,927

4.4 RECENT ENHANCEMENTS TO THE CITY'S ANNUAL OPERATION AND MAINTENANCE PROGRAM

The City has started developing portions of an updated municipal O&M Program including the following activities:

- The City has adopted the 2005 Ecology Manual.
- City structures, such as tide gates, are inspected at least twice annually; some other areas and structures are also inspected during/after every heavy rain and flow event.
- All catch basins and stormwater conveyance pipes are cleaned and inspected at least once every two years by an outside contractor.
- The City has an Interlocal Agreement (ILA) with Snohomish County for maintenance work that includes pond maintenance and ditch cleaning.
- Public Works staff has been trained on the operation of the City's sweeper and vactor equipment.
- The Public Works Department uses iWorQ's work order system for tracking and managing its work assignments to the O&M crew.

4.5 FUTURE OF THE CITY'S OPERATION AND MAINTENANCE PROGRAM

As the City's stormwater system grows in size and complexity, the City will want to expeditiously expand its O&M Program in order to ensure that adequate staffing, supplies, outside support services, and funding are provided on an annual basis.

Recommendations/Suggestions:

- ***Maintain Responsiveness to the Public:*** Compliance with a new future Permit is important, but the real driver for a good annual O&M Program, is that it gives the City the ability to be responsive to public complaints and to reduce the number and magnitude of flooding problems, thus reducing property damage and enhancing public safety, and creating a positive public perception.
- ***Routinely Review and Re-Focus Annual O&M Program to Optimize Resources:*** Because O&M resources are always limited, the City's O&M crews will want to develop an annual maintenance work program and then routinely review and update it in order to set priorities, and optimize the use of its resources.
- ***Complete and Update Facility Inventory/Mapping For Use As A Management Tool:*** A critical tool in directing and optimizing resources, as well as refining and redefining objectives, is complete, up to date, and detailed inventory and mapping of existing facilities. Using the facilities inventory as a key management tool, work orders can be specifically written and tied to the completion of work in the field.

  Many agencies are now putting their SWM facilities into a GIS geodatabase and then giving crew members an iPad (mobile device) so they can collect and record field data directly into the geodatabase. This device allows the crew to record the completion of work as it is performed on individual facilities in the field. With the collection of this type of information and use of this type of technology, the City will be creating a unique database so its crews can select only those facilities that need maintenance, based on previous recorded inspection results. This allows the O&M program to be much more specific so it focuses only on those facilities that need O&M, thus saving limited resources and getting the most out of the resources that the City has annually allocated for maintenance.

CHAPTER 5
STORMWATER SYSTEM
HYDROLOGIC AND HYDRAULIC MODELING

5.1 INTRODUCTION

One of the primary objectives of the City in updating its Stormwater Comprehensive Plan (SCP) was the creation of a list of needed stormwater capital improvement projects and resulting Capital Improvement Program (CIP) to address flooding concerns throughout the City. The updated drainage CIP for the City was developed by identifying problem locations using two different methods and integrating the results into one master list. The first method used a drainage needs inventory developed by surveying City staff and the public for observed nuisance drainage problems. The second method analyzed selected drainage problem areas within the downtown portion of the City, and then used computer models to identify problem locations and design solutions. Results of these two methods were integrated and used to form the City's updated drainage CIP, with a prioritization of the needed capital improvement projects and cost estimates for each, as presented in Chapter 6.

This chapter presents the approach, methodology, and results used for the development and implementation of the modeling that was used to evaluate the capacity of some of the City's worst flooding problem areas and design solutions. The result is an updated CIP and list of needed drainage projects that was derived from 54 identified drainage problem areas located throughout the City. The top ten (10) highest priority drainage problems were selected for the computer modeling analysis.

5.2 MODELING ANALYSIS TO ACHIEVE DESIRED LEVEL OF SERVICE

Locations within the City's drainage system were identified as problems if they did not meet the following two-part performance standard. The first part of the standard specifies what water levels in the stormwater system are considered contained within the system (without any major flooding). For the purposes of this plan, the stormwater system is considered flooding if:

- Water levels within the stormwater pipe network exceed the elevation of a catch basin or manhole rim, causing ponding or flooding in the street; or
- Water levels within an open channel system exceed the banks and cause nuisance flooding or property damage.

The second part of the standard specifies how frequently the stormwater system can flood and not be considered a failure. This is commonly called the *flood frequency return interval* and is calculated as one divided by the probability of occurring in any given year. For example, the 2-year flood has a 50% chance of occurring in any given year, and the 25-year flood has a 4% chance of occurring in

any given year. For the purposes of this plan, the system is considered to be failing if the system floods during the 25-year return interval flood.

5.3 DEVELOPMENT OF THE STANWOOD STORMWATER MODEL

5.3.1 Selection of Areas for Modeling

The areas identified for stormwater modeling are located within the downtown core where an aged stormwater system and capacity limitations routinely cause chronic flooding. The identified areas include four sub-areas on the west side of town between 93rd Drive NW and 104th Drive NW, and one area to the east of 94th Drive NW that includes drainage from 92nd Avenue NW and 271st Street NW. The four sub-areas on the west side of town are *headwater basins*, meaning there are no pipes or ditches adding flows from outside the basin. The east downtown area that was modeled receives runoff from Douglas Creek via the ditch on Lover's Lane Road and 92nd Avenue NW. Because flows from Douglas Creek are tidally influenced, the hydrology of that modeling area is substantially more complicated than that of the four more western modeling sub-areas between 93rd Drive NW and 104th Drive NW.

The five areas selected by the City for stormwater modeling were based on need and available resources and, in general, followed the recommendations provided by NHC in the March 31, 2014, memorandum (see Appendix A.8). These five areas are displayed in Figure 5-1, titled Stormwater Model Areas.

- *Model Areas #1 – 3: Augusta Street** –The first three drainage basins flow from the Stormwater Model Outfall down into the area affected by the Irvine Slough Stormwater Separation Project (ISSSP). (Note: Model Areas #1-3 include three smaller systems that were combined for the purposes of modeling and were analyzed as a single system, as shown in Figure 5-1.)
  **Augusta Street is located between 270th Street NW and 268th Street NW, just to the west of the intersection of Camano Street with 268th Street NW.*
- *Model Area #4: 94th Drive NW* – Stormwater Model Outfall to Irvine Slough Stormwater Separation Project (ISSSP) from 94th Drive NW.
- *Model Area #5: 92nd Avenue NW* – Stormwater Model Outfall to Irvine Slough Stormwater Separation Project (ISSSP) from 92nd Avenue NW.

5.3.2 Irvine Slough Stormwater Separation Project

The City's stormwater system currently routes runoff via gravity from all of the modeled areas to Irvine Slough where it is pumped into the Old Stillaguamish River Channel through the Irvine Slough Pump Station. However, the City is planning a major stormwater system improvement, called the Irvine Slough Stormwater Separation Project (ISSSP), that may potentially include construction of a new stormwater system along the north side of SR 532. The primary objectives of the ISSSP are to prevent flooding of downtown Stanwood by separating flows from the City's stormwater system from the elevated flows of the

Stillaguamish River, and to increase the flood carrying capacity of Irvine Slough in order to reduce flood levels of the Stillaguamish River.

This project will look at flood reduction options, including reducing flooding within the low-lying downtown areas by conveying stormwater runoff west to a new outfall to the river at West Pass, located west of the Irvine Slough Pump Station. The outfall may include a new pump station, similar to the Irvine Slough Pump Station. At this point in time, prior to conducting the ISSSP modeling and design study, it is not immediately clear what role the existing pump station might play in the new configuration of pump and conveyance facilities that may come out of the ISSSP study. It could be moved, abandoned, or incorporated into a new flow reduction plan for the area.

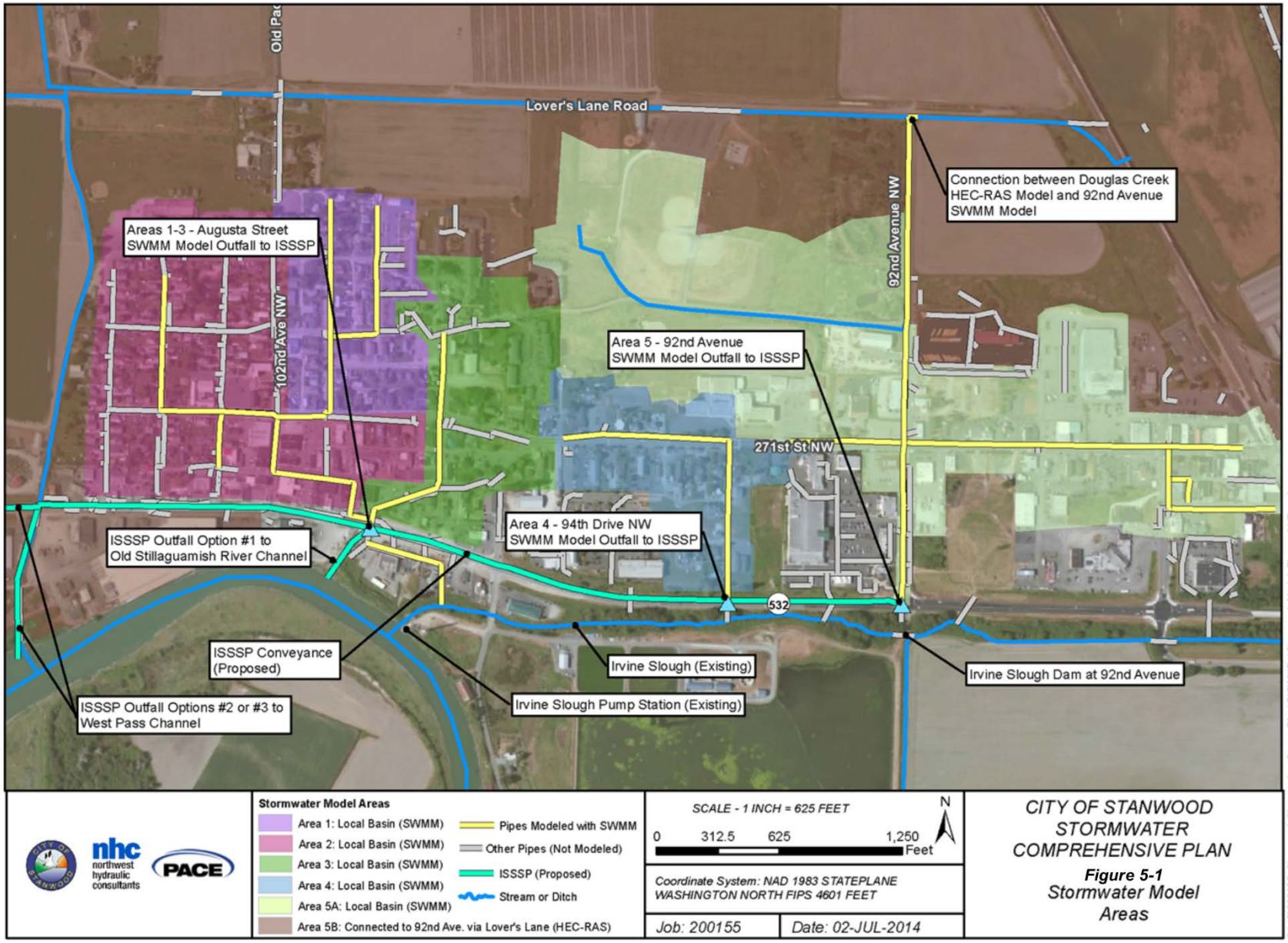
Three potential outfall routes for the new ISSSP conveyance system are shown in Figure 5-1. (Note: This ISSSP drainage study is discussed in additional detail in Chapter 6, and is one of the highest ranked CIP projects in terms of priority. No detailed design is included here because the design options will be thoroughly investigated during the upcoming regional ISSSP study.)

For the purposes of modeling and this drainage CIP project development process, it has been assumed that this proposed ISSSP will be completed, and will be designed to prevent stormwater from backing up into the City's network of piped conveyances and outfalls. As a result, system failures (i.e., localized flooding) were only identified if the problem occurs in one of two reduced hypothetical ISSSP configurations that would have reduced backwater effects relative to the existing Irvine Slough. Those configurations include: 1) freely discharging outfall pipes, with no restriction from the downstream collection system, and 2) a static four-foot water level elevation in the downstream collection system. The four-foot water level threshold was selected by reviewing project monitoring data collected upstream of 92nd Avenue NW on Irvine Slough. That data showed that the water level in Irvine Slough frequently reaches a depth of four feet during concurrent small winter storms and high-tides. Based on that data, it was assumed that the ISSSP should be able to at least keep water levels below those routinely controlled at Irvine Slough. Application of these modeling assumptions regarding the outfall water levels to the development of drainage CIP project solutions is discussed further in Chapter 6.

5.3.3 Modeling Approach

The approach applied to the hydraulic modeling of the City's stormwater system follows the Snohomish County Hydrologic Modeling Protocols, developed by NHC and others (Snohomish County, 2001). Runoff from the land surface was calculated using Hydrologic Simulation Program Fortran (HSPF) and Stormwater Management Model (SWMM) to calculate water levels within the City's stormwater system (EPA, 2005 and 2007). Additionally, inflows into Area 5, the 92nd Street NW system, were calculated using a HEC-RAS (HEC, 2010) model of Douglas Creek. Both the HSPF model and HEC-RAS model

were originally developed and calibrated by NHC for Snohomish County Surface Water Management as part of the Douglas Creek Basin Characterization Project (NHC, 2014). That project is still underway, but the model was calibrated to observed flow and water level data collected from Douglas Creek, Lover's Lane Road, and Irvine Slough before the models were applied to this project. Complete documentation of the Douglas Creek HSPF and HEC-RAS model development will be provided in the County's report when it is completed, but an overview of relevant information is briefly summarized within this section of the City's updated SCP.


Old Pac
Lover's Lane Road
Connection between Douglas Creek HEC-RAS Model and 92nd Avenue SWMM Model
92nd Avenue NW
Areas 1-3 - Augusta Street SWMM Model Outfall to ISSSP
102nd Ave NW
Area 5 - 92nd Avenue SWMM Model Outfall to ISSSP
271st St NW
Area 4 - 94th Drive NW SWMM Model Outfall to ISSSP
ISSSP Outfall Option #1 to Old Stillaguamish River Channel
532
ISSSP Conveyance (Proposed)
Irvine Slough (Existing)
Irvine Slough Dam at 92nd Avenue
ISSSP Outfall Options #2 or #3 to West Pass Channel
Irvine Slough Pump Station (Existing)
Stormwater Model Areas
Area 1: Local Basin (SWMM)
Area 2: Local Basin (SWMM)
Area 3: Local Basin (SWMM)
Area 4: Local Basin (SWMM)
Area 5A: Local Basin (SWMM)
Area 5B: Connected to 92nd Ave. via Lover's Lane (HEC-RAS)
Pipes Modeled with SWMM
Other Pipes (Not Modeled)
ISSSP (Proposed)
Stream or Ditch
SCALE - 1 INCH = 625 FEET
0 312.5 625 1,250 Feet
N
Coordinate System: NAD 1983 STATEPLANE WASHINGTON NORTH FIPS 4601 FEET
Job: 200155
Date: 02-JUL-2014
CITY OF STANWOOD STORMWATER COMPREHENSIVE PLAN
Figure 5-1
Stormwater Model Areas
nhc northwest hydraulic consultants
PACE

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Outlined below, in steps #1 through #8, is how the suite of models was applied to Areas 1 through 4 (Area 5 is discussed separately below):

1. Pipe network geometries were developed for SWMM models. All of the models were terminated at SR 532, the approximate location of the outfalls when the ISSSP is constructed.
2. The HSPF model representation of the conveyance system was updated with flow rate and system storage volumes from SWMM, and assumed a free outfall condition at the ISSSP.
3. The HSPF Model was run to simulate flows under existing conditions in the drainage system for the period 1949 through 2013.
4. A flood frequency analysis was performed to identify the 25-year flows at each of the two stormwater system outfalls (see item 6).
5. A historic storm event, October 1960, was identified as having a similar peak discharge as the statistical 25-year storm.
6. The land surface runoff rates, calculated with HSPF for the October 1960 event, were scaled to match the statistical 25-year storm discharge. The needed scaling factors were 0.989 in modeling Areas 1 through 3 – Augusta Street, and 0.916 in modeling Area 4 – 94th Drive NW.
7. This scaled October 1960 storm event was applied to the SWMM models for simulation of water levels throughout the modeled portions of the stormwater system. These water level simulations were used to identify which locations in the stormwater system experience flooding with the ISSSP constructed, but without any other CIP projects in place.
8. The SWMM model was run iteratively to identify CIP projects needed to eliminate street flooding within the modeled portions of the stormwater system. These runs were made for both a free outfall condition at the ISSSP and fixed outfall water level of 4 feet NAVD 1988 within Irvine Slough.

For Area 5, along 92nd Avenue NW, the models were applied in a similar fashion as applied to areas 1 through 4, except that the inflows from Lover's Lane Road had to be accounted for through application of the Stillaguamish River and Douglas Creek HEC-RAS models. Steps #1 through #3 are identical to those listed above for Area 5, but steps #4 through #12 included some additional steps that were not needed for Areas 1 through 4.

The additional modeling steps needed to model Area #5 include the following:

1–3. Same as the first three listed above.

4. The Stillaguamish River HEC-RAS model was run for the period 1960 through 1961, and 1980 through 2012, to calculate a time-series of water levels at the outfall from Douglas Creek into the Stillaguamish River. The model run utilized HSPF simulated runoff from Step #3, USGS observed Stillaguamish River flows at

Arlington, and a time-series of hourly NOAA tides at Everett for the model simulation period. This simulation period was shorter than that used in Areas 1 through 4 because the HEC-RAS model runs are very computationally intense; however, it was considered to be of adequate length for a statistical analysis of flows in this system. The 1960 through 1961 period was only included to see if the same October 1960 storm event, identified for Areas 1 through 4 could, also be used for Area 5.

5. A table defining the relationship between water level and discharge in the 92nd Avenue NW ditch at Lover's Lane Road, the location where the Area 5 SWMM model interfaces with the Douglas Creek HEC-RAS model, was developed using the SWMM model of the 92nd Avenue NW stormwater system. The resulting rating table was assigned to the HEC-RAS model to define the relationship between depth and flow at that location in the system.

6. The Douglas Creek HEC-RAS model was run for the periods 1960 through 1961, and 1980 through 2012, to calculate a time-series of inflows to the 92nd Avenue NW stormwater system from Lover's Lane Road for that period. The model run utilized the HSPF simulated runoff from Step #3 and the time-series of tides at the Douglas Creek outfall simulated from Step #4 for the model simulation period. The model run calculated 2 cfs of inflow on average, with a peak inflow of 11 cfs occurring less frequently than the 5-year flood. Flow reversals to the north were not allowed.

7. The Area 5 SWMM model was run for the periods 1960 through 1961, and 1980 through 2012, to calculate a time-series of flows through the 92nd Avenue NW stormwater system. The model run utilized HSPF simulated runoff from Step #3, and the time-series of simulated inflows from Lover's Lane Road into the 92nd Avenue NW stormwater system, simulated in Step #6, for the model simulation period.

8. A flood frequency analysis was performed to identify the 25-year flows at the 92nd Avenue NW stormwater system outfall.

9. The October 1960 historic storm event was identified as having a similar peak discharge as that of the statistical 25-year storm. (Note: This is the same event used in Areas 1 through 4.)

10. The Lover's Lane Road inflow rates calculated with HEC-RAS in Step #6, and the land surface runoff rates calculated with HSPF in Step #3 for the October 1960 event, were scaled by a factor of 0.895 to match the statistical 25-year storm discharge.

11. This scaled October 1960 storm event was applied to the Area 5 SWMM model for simulation of water levels throughout the system. These water level simulations were used to identify which locations in the stormwater system experience flooding with the ISSSP constructed, but without any other CIP projects in place.

12. The SWMM model was run iteratively to identify CIP projects needed to eliminate street flooding within the modeled portions of the stormwater system. These runs were made for both a free outfall condition at the ISSSP and fixed outfall water level of 4 feet NAVD 1988.

5.3.4 Pipe Network Geometry and Sub-Basin Delineations

The model was defined using the City's GIS stormwater inventory, as-built drawings, LiDAR elevation data, field reconnaissance, and consultation with City staff. The model is generally limited to pipes in the City's stormwater system that exceed 12 inches in diameter, though some key smaller pipes were added to capture full network connectivity. The resulting geometry of the City's stormwater system used in this modeling analysis, as shown in Figure 5-1, includes 83 modeled pipes or ditches and 70 catch basins or manholes. Individual subbasins were delineated to define the contributing area draining to 24 of the 70 inlets in the modeled stormwater system. Each of the sub-basins averaged about 6.2 acres in total area. (Note: Those pipes that were modeled are shown in yellow, and the other supporting drainage pipes are shown in white, within each of the five model areas.)

There are a relatively large number of stormwater system features that are missing, missing attributes, or are not spatially correct in the City's GIS inventory. Most features are off by about 30 feet spatially, as well. (Note: This was also documented in compiling the data for the GIS geodatabase of the City's stormwater system.) To address these data gaps, NHC staff filled in data gaps in those portions of the stormwater system that were targeted for modeling. These gaps were filled in by collecting the missing data using RTK GPS equipment to record the location and elevations of catch basins and manholes, measurements of the depth to pipe inverts below the ground surface, review of as-built drawings, the Snohomish County drainage inventory, and discussions with City staff.

5.3.5 Model Representation of Land Cover and Soil

The HSPF model calculates hydrologic runoff by calculating the hydrologic response of different combinations of land cover and soil to rainfall that falls on the land surface. The model used here utilized an existing land cover condition that was characterized by Snohomish County for the study area basin (NHC, 2014) and soils data from the NRCS, as described previously in Chapter 2. It is worth noting that an existing land cover condition, rather than a future build-out land cover condition, was used because the amount of land-surface runoff is proportional to the area of pervious land cover that has been converted to impervious land cover as a result of development in the basin. (Note: The rate water reaches the stormwater system can be mitigated with engineered flow controls such as infiltration or

detention ponds). It was decided that an existing land cover condition was appropriate for sizing new CIP projects because it is expected that the future land cover within the study area basins will have a similar impervious area to that of the City's existing pattern of land use. According to the 2012 Ecology Manual amended in 2014, any increase in impervious area associated with any new or redevelopment will be mitigated with onsite flow controls. Thus, future land uses will be generating an amount of runoff similar to that currently being generated under existing land use conditions. In addition to land cover, the amount of runoff is also a function of rainfall intensity, rainfall duration, soil type, and tidal fluctuations, but these factors do not generally change significantly within the planning horizon of 30 years. (Note: That if there is a large area within the study area that increases in density under future development, but is exempt from onsite flow control requirements due to their ability to provide direct discharge to the Stillaguamish River, then the capacity of the stormwater system should be re-evaluated to ensure that adequate capacity exists.)

5.3.6 Flood Frequency Analysis Results

The modeling approach used for this evaluation of drainage system capacity utilized a flood frequency analysis to identify the rate of flow within each basin that corresponds to the 25-year flood event, based on the simulated flows within the stormwater system. That analysis was done using 65 and 34 years' worth of accumulated flow data from simulated discharges of the system that flows into the ISSSP for Areas 1-4 and 5, respectively. Table 5-1 summarizes the resulting 25-year return interval peak flow statistics for the two model geometries of each system, one with restrictions remaining in the system and the other without. The "without restrictions" condition represents a system in which all of the drainage CIP projects that are sized and discussed in Chapter 6 have been constructed. In the "with restrictions" condition, all of those existing restrictions within the City's drainage system are still in place. The un-routed surface runoff and inflows to the 92nd Street NW system from outside the basin (i.e., Lover's Lane Road) are also presented in the table. Most notable is that discharges at the outfall for Areas 1-3 nearly doubles when CIP projects are added to remove the restrictions within the system. This doubling occurs because there is a substantial amount of surface ponding within the system providing internal detention (and flooding within the City) that is slowly released back into the system under existing conditions and freely discharges to the outfall when restrictions are removed from the system. This limitation in the capacity of the system is not related to Irvine Slough or the ISSSP because the model is assuming no restrictions to the outfall from the downstream collection system. These types of delays in flow are characteristic of the nature and function of the City's drainage system itself, including the network and size of pipes and ditches that currently make up the City's drainage system.

Table 5-1: Flood Frequency Statistics: For Modeled Areas of City's Stormwater System				
Model Area	25-year Flood Peak Discharge (cfs)			
	Flow @ ISSSP Outfall		Un-Routed Surface Runoff Flow	Inflow from Outside Basin
	With restrictions in system (Without CIP improvements)	Without restrictions in system (With CIP improvements)		
Areas 1 – 3, 103rd Drive to Augusta Street	13	25	34	–
Area 4, 94th Avenue NW	7.5	–	7.6	–
Area 5, 92nd Avenue NW	23	26	32	5

As stated earlier, the historical storm used to characterize the 25-year flood in the system was the October 23, 1960, event. There are other events with a similar peak discharge, but the selected event had multiple advantages, particularly that the inflows to the Area 5, the 92nd Avenue NW modeling area, were dominated by local runoff rather than inflows from Lover's Lane Road. Some other historical storms with comparable total flows at the system outfall had simulated inflows from Lover's Lane Road, on the order of 10 cfs, but lower local inflows. It was decided that the selected event was the best suited for sizing of the conveyance elements within the stormwater pipe network, which was the focus of this current stormwater planning effort. The resulting 25-year flood hydrographs and hyetographs of flow and precipitation, reflecting the October 23, 1960, flood pattern, are shown in Figures 5-2 and 5-3. Figure 5-2 shows flow restrictions before proposed CIP project construction, and Figure 5-3 shows flows with the constructed CIP outfall project in place, thus, without any flow restrictions.

Figure 5-2: Simulated Runoff and System Outfall Discharges: With Flow Restrictions (Without CIPs constructed)

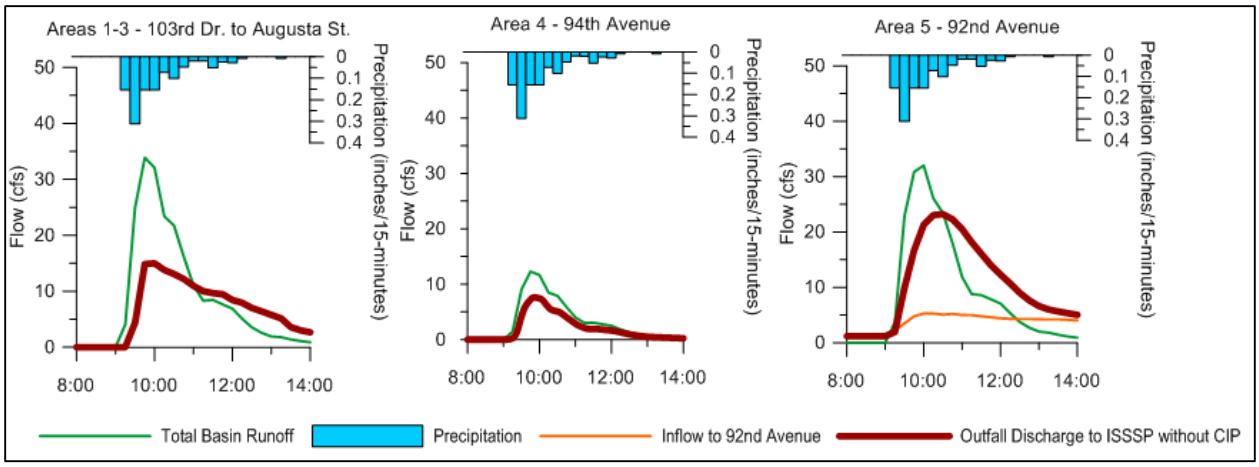
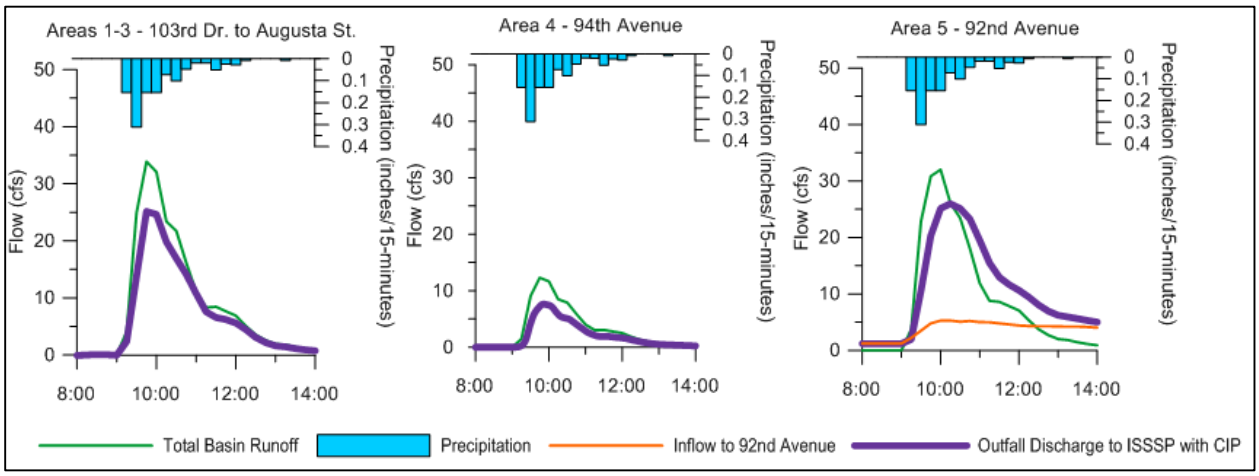


Figure 5-3: Simulated Runoff and System Outfall Discharges: Without Flow Restrictions (With CIPs constructed)



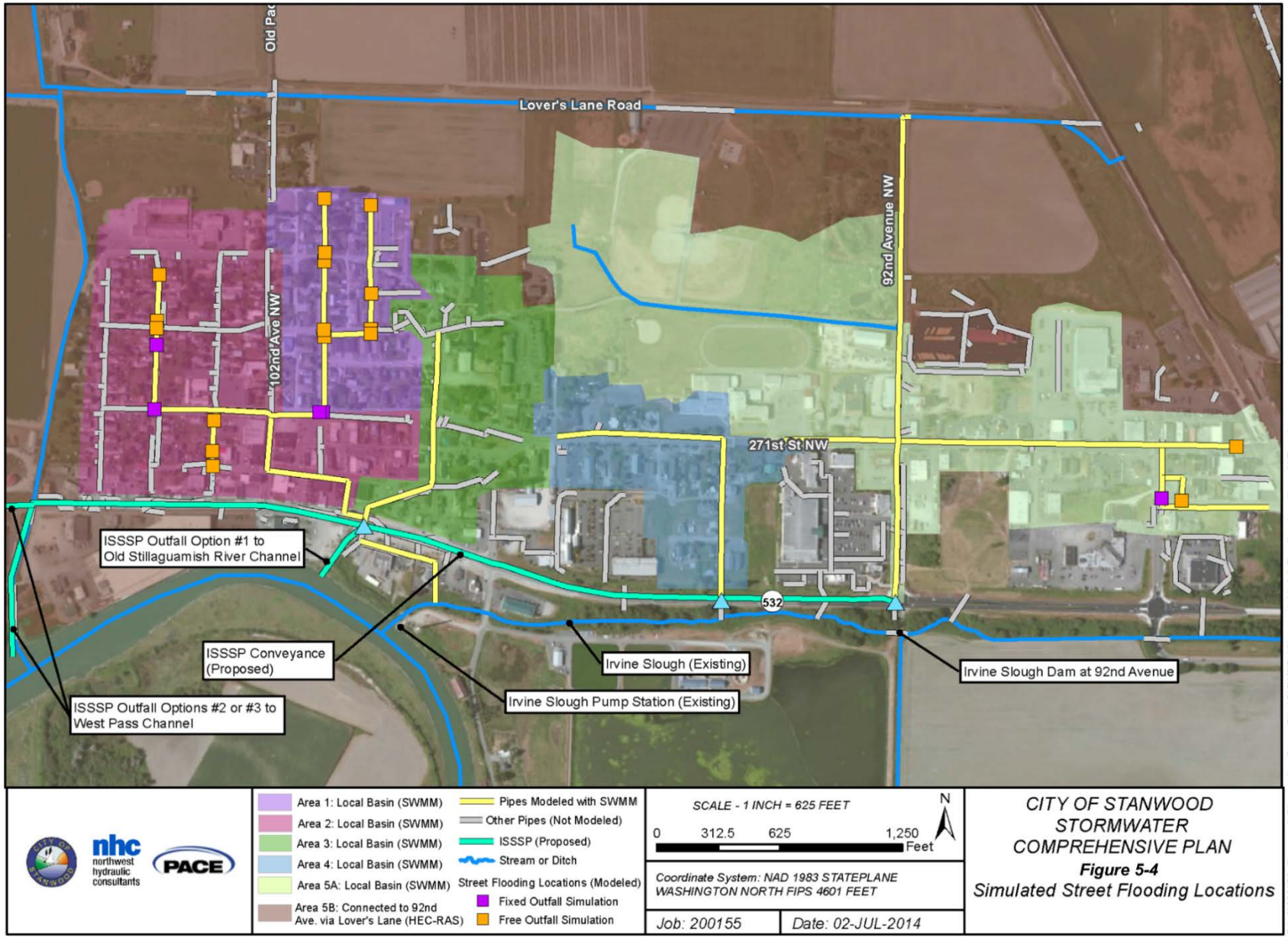
5.3.7 Flooding Locations within City's Existing/Future Drainage System

The stormwater model was applied to identify two sets of existing flooding locations within the stormwater system. The first set corresponded to the free outfall condition in which there is no backwater restriction imposed on the outfall of the stormwater system, and a second in which the ISSSP was limited to a water elevation of 4 feet. (See previous discussion of ISSSP for background on the use of two outfall water level conditions in Section 5.3.2.) A total of 17 catch basins or manholes had water levels classified as street flooding from the free outfall condition simulation results; these are identified as orange squares in Figure 5-4. An additional five locations were classified as street flooding from the high 4-foot water elevation run, as shown as purple squares in Figure 5-4.

Most of the flooding locations are located within Areas 1 – 3, 103rd Drive NW to Augusta Street subbasins. There was no flooding in Area 4, the 94th Avenue NW subbasin, and there were only two flooding locations in Area 5 (within the 92nd Avenue NW basin). The CIP projects sized to address these flooding problems are presented in Chapter 6.

5.4 SUMMARY OF STANWOOD MODELING ANALYSIS

The modeling of the City's stormwater drainage system was used as a tool to investigate the most complicated problem areas within the City's drainage system. The modeling was used to both better describe the nature and frequency of the problem, as well as to identify the appropriate sized pipe or ditch to reduce flooding to the desired level of service. The modeling analysis again used the 25-year flow/rainfall event as the desired level of service. This level of flood control is typical within most urban areas and is largely dictated by the amount of money a community has available to build and annually maintain its drainage system.


Old Pac
Lover's Lane Road
102nd Ave NW
92nd Avenue NW
271st St NW
532
ISSSP Outfall Option #1 to Old Stillaguamish River Channel
ISSSP Conveyance (Proposed)
ISSSP Outfall Options #2 or #3 to West Pass Channel
Irvine Slough (Existing)
Irvine Slough Pump Station (Existing)
Irvine Slough Dam at 92nd Avenue
Area 1: Local Basin (SWMM)
Area 2: Local Basin (SWMM)
Area 3: Local Basin (SWMM)
Area 4: Local Basin (SWMM)
Area 5A: Local Basin (SWMM)
Area 5B: Connected to 92nd Ave. via Lover's Lane (HEC-RAS)
Pipes Modeled with SWMM
Other Pipes (Not Modeled)
ISSSP (Proposed)
Stream or Ditch
Street Flooding Locations (Modeled)
Fixed Outfall Simulation
Free Outfall Simulation
SCALE - 1 INCH = 625 FEET
0 312.5 625 1,250 Feet
N
Coordinate System: NAD 1983 STATEPLANE WASHINGTON NORTH FIPS 4601 FEET
Job: 200155
Date: 02-JUL-2014
nhc northwest hydraulic consultants
PACE
CITY OF STANWOOD STORMWATER COMPREHENSIVE PLAN
Figure 5-4
Simulated Street Flooding Locations
O:_C\200155_Stanwood_Stormwater_Comp_Plan\GIS\MXDs\Stanwood_Model_Flooding_Locations_ALT.mxd

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In all, a total of 39 drainage problems were identified through this modeling analysis. The most significant and unique problems not already identified by City staff or the public were placed in the master list of drainage problems. These problems were rated and ranked, and are shown in the master list of drainage problems presented in the following chapter. Those that are of an adequately high ranking and priority/severity were developed into new capital improvement projects that will allow the City to reduce the frequency and severity of flooding. The 39 drainage problems are listed below by each of the five modeling areas.

Summary of Results by Model Area:

- **Model Areas #1 – 3: Augusta Street – SWMM Model Outfall to ISSSP**
  - *Under Existing Conditions with No Restriction:*
    - ✓ 15 drainage problem areas identified, these include:
      - 103rd Drive NW (3)
      - 102nd Drive NW (3)
      - 101st Avenue NW (5)
      - 100th Avenue NW (4)
  - *Under Existing Conditions with 4 Feet of Backwater:*
    - ✓ 19 drainage problem areas identified, these include:
      - 103rd Drive NW (5)
      - 102nd Drive NW (3)
      - 101st Avenue NW (7)
      - 100th Avenue NW (4)
- **Model Area #4: 94th Drive NW – SWMM Model Outfall to ISSSP**
  - *Under Existing Conditions with No Restriction:*
    - ✓ No drainage problem areas identified,
  - *Under Existing Conditions with 4 Feet of Backwater,*
    - ✓ No drainage problem areas identified, however,
      - Water levels at the library site are at an elevation of 5.85' NAVD 1988, only 0.5 feet below the rim of the catch basin at that site.
- **Model Area #5: 92nd Avenue NW – SWMM Model Outfall to ISSSP**
  - *Under Existing Conditions with No Restriction:*
    - ✓ 2 drainage problem areas identified, these include:
      - 271st Street NW (1)
      - 270th Street NW (1)
  - *Under Existing Conditions with 4 Feet of Backwater:*
    - ✓ 3 drainage problem areas identified, these include,
      - 271st Street NW (1)
      - 270th Street NW (1)
      - 88th Avenue NW (1)

5.5 BIBLIOGRAPHY AND REFERENCES FOR CHAPTER 5

Environmental Protection Agency. HSPF Version 12.2 User's Manual. Aqua Terra Consultants for USGS and U.S. EPA, 2005.

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CHAPTER 6
DEVELOPMENT OF CAPITAL IMPROVEMENT PROGRAM

6.1 STORMWATER INFRASTRUCTURE PLANNING PROCESS

6.1.1 City's Stormwater Planning Vision

In developing this updated Stormwater Comprehensive Plan (SCP), the City's two main objectives are to identify and resolve drainage and flooding problems, and to conduct a regulatory gap analysis to determine what is needed to achieve compliance with a future NPDES Phase II Municipal Stormwater Permit (Permit). Although not under a Permit at this time, the City wants to take a proactive approach in order to plan ahead and phase in the required future Permit activities at their own pace. This approach allows the City to gradually raise the needed revenue in advance of when it would be annually required for Permit compliance. The results of the regulatory compliance analysis are combined with the drainage Capital Improvement Plan (CIP) presented in this chapter to develop the City's updated SCP. Results of the modeling are presented in Chapters 5 and the capital facility analyses here in Chapter 6.

This chapter presents the City's process to identify and resolve existing and projected future flooding problems. Identified drainage problems were reviewed, rated and ranked for severity, and the top ten (10) most significant problems were studied, and alternative design solutions were developed and evaluated. The result of each alternative analysis is a preferred design solution that is developed and presented to the City in the form of a recommended capital improvement project. It has been assumed for the purpose of this study that the City's existing type and amount of impervious surfaces will be similar to future built out conditions, because the current drainage code requires any new and/or re-development within the City to have no net increase in runoff leaving the site after a site has been developed.

6.1.2 Assumption Regarding the Irvine Slough Stormwater Separation Project

This chapter also gathers information to support the City's future alternative flood design study, the Irvine Slough Stormwater Separation Project (ISSSP). This regional flood reduction study will investigate the separation of stormwater from the City's discharges into Irvine Slough and evaluate options to reduce flooding within the lower reaches of the Stillaguamish River and floodplains. (Note: The proposed CIP assumes that the ISSSP will be developed or that some type of positive conveyance enhancement improvement will be constructed to remove excess stormwater from within the most western parts of the City.)

Without this type of improved conveyance enhancement and removal of excess drainage within the most western part of the City, the proposed capital projects would not have the in-line capacity for storage or the "hydraulic drop" needed to continue to drain the interior of the City by gravity.

For all of the drainage CIP projects that are located in subbasins draining to Irvine Slough, it is assumed that the ISSSP project will be completed. It is also recognized that the ISSSP design may affect the performance of the recommended CIPs, depending on how well the ISSSP controls water levels in the drainage collection system. To address this uncertainty, these CIP solutions were sized to meet two different ISSSP design conditions, each with a different level of performance. The better performing design was assumed to keep water levels in the ISSSP nearly dry, allowing the outfalls to be modeled with a free outfall condition, i.e., draining undetained via gravity at the design capacity of the system (corresponding to an ISSSP water level of approximately zero feet NAVD 1988). The slightly lower performing ISSSP design was assumed to have a higher water level in the ISSSP of 4' NAVD 1988 (corresponding to about 4 feet of water in the slough).

In only two cases (Projects #5 and #8), the identified CIP solution does not fully mitigate flooding with this higher ISSSP water level condition. It is also possible that an ISSSP design that controls water levels to even a 4' threshold may be too costly for construction. If that is the case, then the recommended CIP solutions will not provide 25-year capacity. As a result, these CIP solutions should be considered the minimum needs, assuming the ISSSP meets the design assumptions.

6.1.3 Identifying Problems and Developing Solutions: The City's Updated Stormwater Capital Improvement Plan

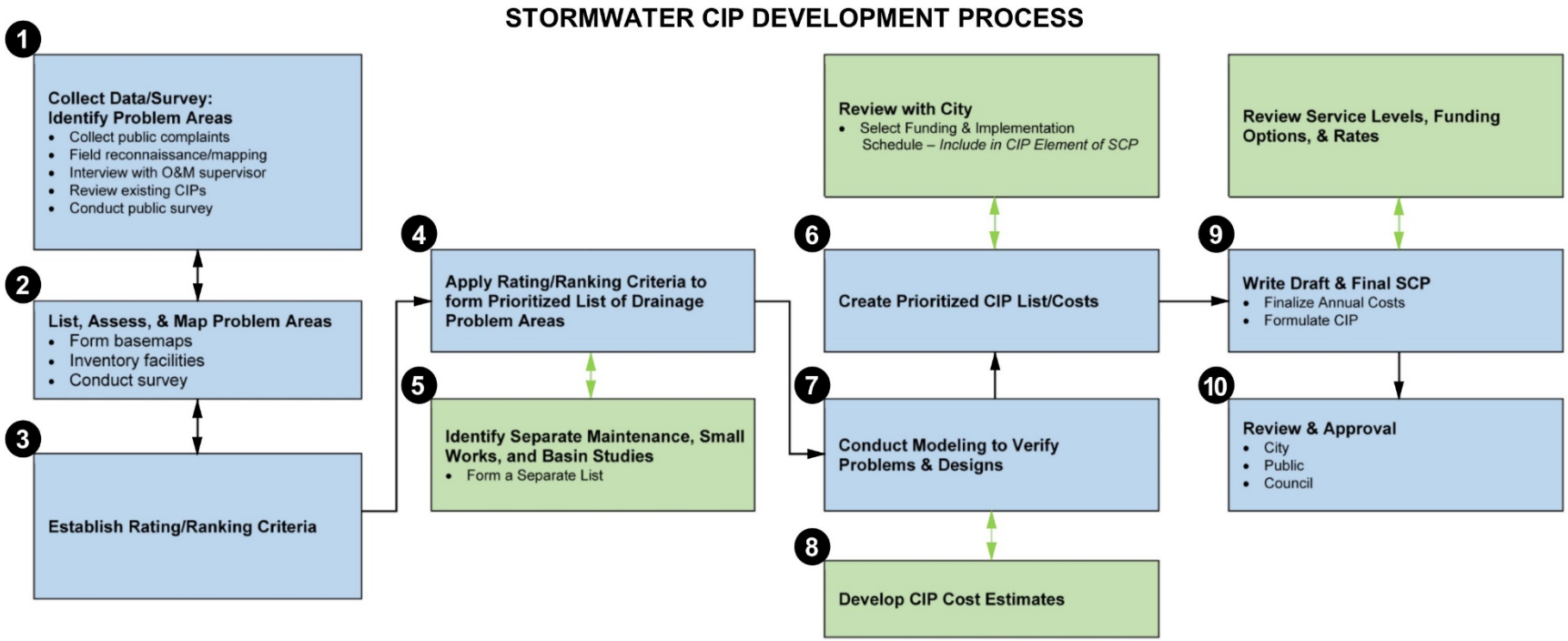
The primary product of Chapter 6 is a prioritized list of the 54 (fifty-four) drainage problems or drainage concerns identified throughout the City. Each of the identified drainage problems has gone through a thorough review, ranking, and evaluation. As part of this evaluation, each of the problems was rated and ranked using criteria reviewed and approved in advance by the City. Once this master list was assembled, the top ten (10) highest priority drainage problems, that is, the most severe drainage problems, were selected for further engineering analysis. The results of these analyses included a review of alternative solutions and the selection of one preferred design for each problem, allowing cost estimates to be performed. All ten of these projects were combined to form the City's updated CIP for future funding and implementation. This stormwater capital facility planning process is graphically displayed in the schematic diagram presented below in Figure 6-1.

The City's stormwater capital facility planning process consists of the following activities:

1. Collection of data and identification of drainage problems
2. List, assess, and map drainage problem areas
3. Establish rating and ranking criteria, and receive City approval
4. Apply criteria and form prioritized list of drainage problem areas
5. Separate out O&M, small works, and basin studies
6. Create a master prioritized list of drainage problems
7. Select top ten ranked problem areas and conduct modeling

8. Conduct engineering flow capacity analysis, prepare and evaluate design options, and select the preferred designs
9. Finalize drainage CIP designs and develop cost estimates
10. Integrate preferred capital projects into the City's CIP list
11. Integrate the resulting drainage CIP list into the City's updated SCP

Figure 6-1: Schematic Diagram of the City's Stormwater Capital Facilities Planning Process



6.2 COLLECT DATA AND IDENTIFY DRAINAGE PROBLEMS (STEP #1)

6.2.1 Stormwater Program and Flooding Data from the City

The first step in the development of the City's stormwater CIP was to collect existing data, formulate a GIS geodatabase, and develop an electronic drainage basemap of the study area. An initial set of needed data was identified by PACE and Northwest Hydraulic Consultants (NHC), and transmitted to the City early in the stormwater planning process. This initial data request included requests for programmatic information as well as documentation of drainage problem areas, including the data needed for the programmatic regulatory compliance gap analysis. This list, which includes the responses from the City, is shown in Appendix A.9.

Mapping data of the City's drainage system was also collected in the form of electronic files that were acquired from the City, the City's consulting engineer, Snohomish County, and Northwest Hydraulic Consultants, Inc. All resulting system inventory and facility information was synthesized and integrated to form the electronic basemap for this drainage study. This map became the background image that was used throughout the planning, modeling, CIP, and SCP development processes, as seen on the numerous maps and figures presented throughout this report. This map and a discussion of the City's existing drainage system have been included earlier in Chapter 2, Section 3.

6.2.2 Additional Drainage Data from the Public

The location, nature, frequency, and impacts of the drainage problems throughout the City were collected by conducting interviews with City staff and by developing and sending out a drainage survey to the public. The public survey is presented in Appendix A.11. A total of 39 public survey responses were collected; 21 were hand written and mailed in, a selection of which are attached in Appendix A.12, and another 18 were filled out electronically and mailed into the City via the City's website, as shown in Appendix A.13. A statistical analysis was performed by PACE correlating the results of the electronic responses, and is shown in Appendix A.14.

6.3 LIST, ASSESS, AND MAP DRAINAGE PROBLEM AREAS (STEP #2)

6.3.1 Formation of the Master List of Drainage Concerns/Problems

With the completion of the staff interviews and compilation of the public surveys, a total of 54 different drainage problem areas or drainage concerns were identified, including over 20 drainage problems identified by City staff. This compilation of 54 drainage problems identified throughout the City included those in both the low lying, older areas of the City to the west, as well as the more recent developments on the upland areas of the City lying to the east, east of the railroad tracks and east of the Pioneer Highway. The list, location and ranking of the problems is shown in the following documents:

- Table 6-1: Master List and Ranking of Identified Drainage Concerns/Problems
- Figure 6-2: Location of Identified Drainage Concerns by Type of Concern/Problem
- Figure 6-3: Location of Identified Drainage Concerns by Source of the Information

6.3.2 Discussion of Master List and Ranking of Identified Drainage Concerns/Problems

The Master List and Ranking of Identified Drainage Concerns/Problems (Master Drainage List), presented in Table 6-1, contains a considerable amount of information and summarizes the field, mapping and engineering analyses. See Appendix A.16 for additional information on each reported drainage complaint, including all the data received from the Public Survey. The table contains the following:

- *Column 1:* is the name of the proposed CIP Project; only those drainage concerns/issues that were most significant were selected to become a CIP project and were given a name; the rest of the drainage concerns were only given identification numbers, which is presented in the third column over from the left.
- *Column 2:* contains the CIP Ranking Number, only the top ten most severe drainage problems were selected for the design of a capital drainage solution and given a corresponding CIP number, based on the previous master ranking and rating process.
- *Column 3:* lists the individual project identification number.
- *Column 4:* displays the source of the problem, and whether it was from the public, the City, the modeling analysis, the field survey, or from other studies and analyses that NHC had done within the region, primarily related to their ongoing study of Douglas Creek for the County.
- *Column 5:* contains the approximate address and/or geographic location of the identified drainage problem.
- *Column 6:* provides a brief description of the problem.
- *Column 7:* categorizes the problem as to type of problem, including; flooding, erosion, standing water, failed infrastructure, undersized pipe, etc.
- *Column 8:* provides, where applicable, appropriate contact personnel.
- *Column 9:* categorizes the project solution as to type of project, including: CIP, small works, private, study, etc.
- *Columns ten through twenty one (10-21):* show the point score for each of the individual ranking and rating criteria.
- *Column 22:* shows the total score of the rating and ranking process for each identified drainage problem; they are presented in order of priority with the worst problem being number #1 and located at the top of this list.

6.3.3 Results and Review of Master Drainage List

This resulting Master List of drainage problem areas was reviewed and refined during the study, and the net result was a total of 54 identified drainage problem areas that became the technical basis for this planning study. This Master List of problems was used to identify and develop the top ten capital facility projects for future funding and implementation. The top ten drainage projects address the City's most significant drainage and flooding problems and include the ISSSP Study, as well as nine other capital projects, that are discussed below.

(Note: In the tables and figures of this report, the identification number of each of the drainage concerns/problems and the proposed CIP project are all correlated and identified by the same drainage concern/problem/project identification number, as presented on the left side of Table 6-1. The top ten most severe drainage problems ranked high enough to be included as the top ten projects in the City's updated Capital Improvement Plan. (Each of the top ten problems/capital projects is discussed in detail below and are presented with supporting descriptions, diagrams, and cost estimates.))

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Table 6-1: Drainage Concerns / CIP Correlation Table

Name (1)	CIP Ranking (2)	ID (3)	Source (4)	Address or Location (5)	Description (6)	Categori-zation of Problem (7)	Contact (8)	Project Type (9)	Improves Infrastructure (10)	Flood Source (11)	Flood Duration (12)	Flood Frequency (13)	Water Quality (14)	Stream Bank Erosion (15)	Hillside Erosion (16)	Instream Habitat (17)	Economic Impact (18)	Complaint History (19)	Aesthetics (20)	Public Perception (21)	TOTAL SCORE (22)
Irvine Slough Stormwater Separation Project (ISSSP)	1	57	City Staff	Irvine Slough	Irvine Slough. Evaluate stormwater collection system on the north side of SR532 to augment or replace Irvine Slough as flood conveyance. ($300,000 *(2014 Dollars)* Irvine Slough/Stormwater Separation Study)	Flooding	Kevin Hushagen (City)	Study	15	15	15	15	1	0	0	3	10	10	2	10	96
		4	City Staff	96th NW & 271 St NW	House on 96th next to the library, the yard floods during a flood event. When we have a flood the water in this area will not drain because Irvine Slough is backed up, so 2 houses next to library have their yards flooded.	Flooding	Trevor Harrison (City)	CIP	15	15	15	15	1	0	0	3	10	10	2	10	96
92nd Ave @ SR 532 Pipe Replacement	2	63	Survey	9326 271st St NW	Standing water in property when it rains.	Standing Water	Public Survey – No name provided	CIP	15	15	15	15	0	0	0	0	10	10	3	10	93
271st Street NW, 102nd Avenue, and 270th St. Trunk Upsize	3	64	Modeling	271st and 102nd Trunk	ID' d with model (addresses City complaint RE 100th and 101st), related to #62 and possibly #42	Improperly Sized Pipe	Derek Stuart (NHC)	CIP	15	15	15	15	0	0	0	0	10	10	3	6	89
85th and Pioneer Hwy Drainage Improvements (Ditch Work)	4	6	City Staff	Pioneer Hwy & 85th Dr. NW	Water runoff from the street in heavy rain events washes the shoulder of the roadway down the hill on 85th Dr. NW into Pioneer Hwy. Water rushes the hill and washes out the shoulder of the road when it rains, need to add 1 or 2 catch basins.	Erosion	Trevor Harrison (City)	CIP	15	15	15	15	0	0	0	0	8	10	2	8	88
		58	City Staff	85th Street NW	85th Street NW Drainage - Collect and convey runoff.	Flooding	Kevin Hushagen (City)	CIP	15	15	15	15	0	0	0	0	8	10	2	8	88
270th Street NW Improvements, Between 88th Ave and Florence/ Resurfacing	5	18	City Staff	90th Ave NW & 271 St NW	270th St drain pipe under roadway is collapsed. Drainage pipe that runs from a catch basin on the north to the south of 270th is collapsed under the roadway.	Failed Infrastructure	Trevor Harrison (City)	CIP	15	15	15	15	0	0	0	0	8	10	2	8	88
Augusta Street Pipe Upsize	6	65	Modeling	Augusta Street	ID' d with model, related to #62 and City complaint on 100th and 101st	Improperly Sized Pipe	Derek Stuart (NHC)	CIP	15	15	12	15	0	0	0	0	10	10	3	6	86
101st Ave, 102nd Drive, and 103rd Drive Road Improvements and 271st Street NW Pipe Upsize	7	66	Modeling	27218 103rd Dr. NW	ID' d with model, related to #62	Improperly Sized Pipe	Jan Williamson (Citizen)	CIP	15	15	12	15	0	0	0	0	8	10	3	6	84
271st Street NW @ Florence Drive Pipe Upsize	8	34	Survey	8622 270th St NW	Standing water on roadway	Flooding	Public Survey – No name provided	CIP	15	15	15	15	0	0	0	0	10	2	2	8	82
7 Tiny Tubes; Old Stillaguamish Flood Release Culvert Slip Line	9	17	City Staff	92nd Ave NW & 268th St NW	Seven Tubes - 1 gate is completely gone and needs to be replaced. All other 6 tubes need to be replaced due to hold in pipes and gates are old. We have seven flood gates, the hippes are old and have holes in them. One pipe is missing a flood gate and all gates are old.	Failed Infrastructure	Trevor Harrison (City)	CIP	12	15	12	12	0	0	0	0	8	10	2	8	79
85th Street NW Drainage Improvements	10	54	Survey	27832 85th Dr.. NW	Water flowing onto private property from city street	Standing Water	Carol Covert (Citizen)	CIP	15	15	15	15	0	0	0	0	6	2	3	8	79
		40	Survey	Pioneer Hwy & 86th Dr. NW	Water flowing across 86th Dr. and down to Pioneer Hwy.	Flooding	Charles R. (Bob) Hitz (Citizen)	CIP	15	15	15	12	0	0	0	0	10	0	2	8	77
		21	NHC	102nd Ave NW & 268th St NW	Irvine Slough pump station capacity is limited	Flooding	Derek Stuart (NHC)	CIP	15	15	12	3	0	4	0	0	10	10	1	6	76
		33	WSDOT	SR 532 & 270th St NW	"Pumps not keeping up" at Irvine Slough.	Failed Infrastructure	Kim Glass (WSDOT)	CIP	15	15	12	3	0	4	0	0	10	10	1	6	76
		25	NHC	88th Ave NW & 268th ST NW	Flow from Stillaguamish River can cross SR 532 and flood downtown Stanwood.	Flooding	Derek Stuart (NHC)	CIP	15	15	9	3	0	3	0	0	10	10	1	10	76

Table 6-1: Drainage Concerns / CIP Correlation Table

Name (1)	CIP Ranking (2)	ID (3)	Source (4)	Address or Location (5)	Description (6)	Categori-zation of Problem (7)	Contact (8)	Project Type (9)	Improves Infrastructure (10)	Flood Source (11)	Flood Duration (12)	Flood Frequency (13)	Water Quality (14)	Stream Bank Erosion (15)	Hillside Erosion (16)	Instream Habitat (17)	Economic Impact (18)	Complaint History (19)	Aesthetics (20)	Public Perception (21)	TOTAL SCORE (22)
		26	NHC	88th Ave NW & Marine Dr.	Flow from Stillaguamish River can flood park and ride	Flooding	Derek Stuart (NHC)	CIP	15	15	9	3	0	3	0	0	10	10	1	10	76
		55	City Staff	Irvine Slough	Irvine Slough Electrical & Controls Rehab (no pump upgrades). Replacing the entire electrical and control panels	Failed Infrastructure	Kevin Hushagen (City)	CIP	9	15	15	3	0	1	0	1	10	10	0	10	74
		56	City Staff	ISPS	ISPS New Pumps (two each)	Failed Infrastructure	Kevin Hushagen (City)	CIP	9	15	15	3	0	1	0	1	10	10	0	10	74
		20	NHC	268th ST NW & 1-4th Dr. NW	Outfall from this Douglas Creek Outfall is limited.	Flooding	Derek Stuart (NHC)	CIP	15	15	12	12	0	5	0	0	2	6	1	6	74
		24	NHC	92nd Ave NW & 268th St NW	Larsen Dam restricts drainage of flow from east side of 92nd Ave following Stillaguamish River floods	Flooding	Derek Stuart (NHC)	CIP	15	15	9	3	0	3	0	0	10	10	1	6	72
		51	Survey	27126 96th Ave NW	Water flowing onto private property from city street	Flooding	Andy and Julie Johnson (Citizens)	CIP	15	15	9	9	0	0	0	0	8	6	2	8	72
		1	City Staff	76th Dr. NW & 272nd St NW	Backyards on 76th Dr. NW Flood from Water runoff from 272nd St NW. The water from the street on 272nd runs into backyard and forms a puddle; house on corner of 272nd and 76th.	Flooding	Trevor Harrison (City)	CIP	15	15	9	9	0	0	0	0	8	0	2	8	66
		2	City Staff	76th Dr. NW & 276th St NW	Backyards on 76th Dr. NW Flood During Heavy Rain. There are three to four houses that get flooded out in their backyards in heavy rain due to a hill from the school behind their house homeowners say it used to drain.	Flooding	Trevor Harrison (City)	CIP	15	15	9	9	0	0	0	0	8	0	2	8	66
		5	City Staff	Lovers Rd/276th St NW	Lovers Lane 276th water ponds up on side of roadway across from Heritage Park on the north side of the road. Huge puddle forms into the roadway when it rains needs a catch basin.	Flooding	Trevor Harrison (City)	Small Works Project	15	15	9	9	0	0	0	0	8	0	2	8	66
		45	Survey	27327 76th Dr. NW	Non-functioning storm drainage	Standing Water	Carol E. Reed (Citizen)	CIP or Private	15	15	9	15	0	0	0	0	6	0	0	6	66
		37	Survey	271st St NW & 84th Ave NW	Standing water on roadway	Flooding	Ralph H. Nichols (Citizen)	CIP or Small Works Project	15	15	9	15	0	0	0	0	6	0	0	4	64
		38	Survey	7720 Stauffer Rd	Water flowing onto private property from city street	Flooding	Doug Chandler (Citizen)	CIP	15	15	9	15	0	0	0	0	6	0	0	4	64
		39	Survey	7710 Stauffer Rd	Water flowing onto private property from city street	Flooding	Helene Watkins (Citizen)	CIP or Private	15	15	9	15	0	0	0	0	6	0	0	4	64
		43	Survey	27008 90th Ave NW	Non-functioning storm drainage	Flooding	Bill Lenz (Citizen)	CIP	15	15	9	15	0	0	0	0	6	0	0	4	64

Table 6-1: Drainage Concerns / CIP Correlation Table

Name (1)	CIP Ranking (2)	ID (3)	Source (4)	Address or Location (5)	Description (6)	Categori-zation of Problem (7)	Contact (8)	Project Type (9)	Improves Infrastructure (10)	Flood Source (11)	Flood Duration (12)	Flood Frequency (13)	Water Quality (14)	Stream Bank Erosion (15)	Hillside Erosion (16)	Instream Habitat (17)	Economic Impact (18)	Complaint History (19)	Aesthetics (20)	Public Perception (21)	TOTAL SCORE (22)
		47	Survey	72nd Ave NW	Water flowing onto private property from city street	Standing Water	Wallace Middleton (Citizen)	CIP	15	15	9	15	0	0	0	0	6	0	0	4	64
		48	Survey	272nd St NW & 81st Dr. NW	Standing water on roadway	Standing Water	Hendrick Husby (Citizen)	CIP	15	15	9	15	0	0	0	0	6	0	0	4	64
		50	Survey	8600 Cedarhome Drive	Standing water on roadway	Standing Water	Thad Nelson (Citizen)	CIP	15	15	9	15	0	0	0	0	6	0	0	4	64
		52	Survey	26920 94TH Drive NW	Water flowing onto private property from city street	Flooding	Paul I. Kalmakoff (Citizen)	CIP	15	15	9	15	0	0	0	0	6	0	0	4	64
		35	Survey	27616 84th Drive NW	Water flowing onto private property from city street	Flooding	Marilyn Stone (Citizen)	CIP	15	15	9	9	0	0	0	0	8	0	2	4	62
		36	Survey	27813 80th Ave NW	Non-functioning storm drainage	Standing Water	Rod Sundberg (Citizen)	CIP or Small Works Project	15	15	9	12	0	0	0	0	6	0	0	4	61
		62	Survey	27218 103rd Dr. NW	Standing water in property when it rains	Standing Water	Jan Williamson (Citizen)	CIP	15	15	9	9	0	0	0	0	6	0	2	4	60
		30	NHC	102nd Dr. NW & 271 St NW	Aged stormwater pipes allow infiltration into the stormwater system	Failed Infrastructure	Derek Stuart (NHC)	CIP	15	0	15	15	0	0	0	0	0	6	0	6	57
		42	Survey	27030 102nd Dr. NW	Yard floods during heavy rains.	Flooding	James Coleman (Citizen)	CIP or Private	15	0	15	15	0	0	0	0	0	6	0	6	57
		60	City Staff	Citywide	Major maintenance, including Lindstrom pond at Haggens	Flooding	Kevin Hushagen (City)	CIP	9	0	0	0	5	0	5	3	6	10	3	10	51
		22	NHC	102nd Ave NW & 268th St NW	Risk of Flooding at WWTP	Flooding	Derek Stuart (NHC)	CIP	15	15	3	3	0	0	0	0	0	6	1	6	49
		23	NHC	102nd Ave NW & 268th St NW	The sanitary sewer routes stormwater runoff from storms to WWTP.	Failed Infrastructure	Derek Stuart (NHC)	CIP	15	15	3	3	0	0	0	0	0	6	1	6	49
		27	NHC	92nd Ave NW & 271st SW	Adverse Slope Pipe near 92nd Ave	Failed Infrastructure	Derek Stuart (NHC)	Small Works Project	15	15	3	3	0	0	0	0	2	0	1	2	41
		19	City Staff	Lund Hill Rd & Nordic Way	Pioneer Hills south pond control structure is broke and is need of repair. Control structure in the pond has broken parts, the outlet pipe is separated, pipe supports are broken.	Failed Infrastructure	Trevor Harrison (City)	Small Works Project	15	0	0	0	0	0	0	0	0	6	1	6	28
		31	NHC	Nordic Way & Pioneer Hwy	Pioneer Hills pond is not providing the designed level of flow control	Failed Infrastructure	Derek Stuart (NHC)	Small Works Project	15	0	0	0	0	0	0	0	0	6	1	6	28
		32	NHC	287th St NW & 72nd Dr. NW	Kylie Park I detention pond is not providing the designed level of flow control	Failed Infrastructure	Derek Stuart (NHC)	CIP	15	0	0	0	0	0	0	0	0	6	1	6	28
		61	City Staff	Citywide	Comp Plan City - land use, goals and policies, 20140 projected needs, CIP and funding strategies.	Not Applicable	Kevin Hushagen (City)	Study	9	0	0	0	0	0	0	0	0	0	0	0	9

Table 6-1: Drainage Concerns / CIP Correlation Table

Name (1)	CIP Ranking (2)	ID (3)	Source (4)	Address or Location (5)	Description (6)	Categori-zation of Problem (7)	Contact (8)	Project Type (9)	Improves Infrastructure (10)	Flood Source (11)	Flood Duration (12)	Flood Frequency (13)	Water Quality (14)	Stream Bank Erosion (15)	Hillside Erosion (16)	Instream Habitat (17)	Economic Impact (18)	Complaint History (19)	Aesthetics (20)	Public Perception (21)	TOTAL SCORE (22)
		44	Survey	27334 Village Pl NW	1998 heard lots of frogs, now only silence. Frogs are good indicator of environmental health.	Habitat	Public Survey – No name provided	Study	0	0	0	0	0	0	0	5	0	0	0	0	5
		59	City Staff	Citywide	Miscellaneous drainage improvements.	Flooding	Kevin Hushagen (City)	CIP	9	15	15	0	5	5	5	3	10	10	0	10	0
		46	Survey	9332 271st Street NW	Non-functioning storm drainage	Flooding	Terry Greer (Citizen)	CIP	15	15	15	15	0	0	0	0	10	10	3	10	0
		3	City Staff	268th St NW & Floe Rd	The dike is low in this area and needs to be built up, there are sand bags in place now. On a really high tide the water will spill over in this area next to the smoke stack need to build dike up.	Flooding	Trevor Harrison (City)	CIP	15	15	15	15	0	5	0	0	10	0	3	8	0
		28	NHC	Lovers Rd & Lane Rd	Flooding limits agriculture	Flooding	Derek Stuart (NHC)	CIP	15	15	15	3	0	5	0	0	10	10	3	10	0
		29	NHC	Lovers Rd & 102nd Ave NW	Lover's Lane culvert grades and channel limit capacity	Failed Infrastructure	Derek Stuart (NHC)	CIP	15	15	15	3	0	5	0	0	10	10	3	6	0
		53	Survey	27901 86th Drive NW	Water flowing onto private property from city street	Flooding	John J. Shaffer (Citizen)	CIP	15	15	15	15	0	0	0	0	6	2	2	10	0

6.3.3.1 *Types of Various Drainage Concerns/Problems*

Figure 6-2 shows the locations of the problem areas and identifies each drainage problem/concern by type of problem. The drainage issues have been characterized by the following types of problems: CIP (Public/City), CIP (Private), CIP (Small Works or O&M Project), Modeling, O&M, Private, and Study.

6.3.3.2 *Sources of the Various Drainage Concerns/Problems*

Figure 6-3 presents the source of each problem/concern and whether it came from the City, from NHC, from the modeling analysis, or from the results of the public survey. In total, the 54 problems that appear in the Master Drainage List of Problems/Concerns were identified as coming from these five sources:

- City staff – 16
- Modeling analysis – 3
- Northwest Hydraulic Consultants and their knowledge and prior work with Snohomish County on Douglas Creek – 13
- Public survey regarding the City's drainage system – 21
- Washington State Department of Transportation – 1

These sources total 54 projects; upon evaluation and ranking of the original list of 66 problems/concerns, 12 of the projects from the master list were minor and were addressed in the field by the City's maintenance crew. Thus, the master list of drainage concerns/problems has a total of 54 entries.

As an example: *CIP Project Ranking #1, entitled Irvine Slough Stormwater Separation Project (ISSSP)* is represented by two drainage problem areas in the column to the right of the CIP Rating; those two drainage problems areas are ***Problem #57*** entitled **Irvine Slough** and ***Problem #4*** entitled **96th NW and 271st Street NW.** The project has a *Total Score of 96 points* in the column to the far right under Total Score.

6.3.3.3 *Drainage Problems Identified by City Staff*

City staff has been particularly effective during this study in their response to the various drainage concerns raised by the public. Through this stormwater planning process, the City staff has developed a special list of both internal and public drainage concerns and problem areas. Those drainage concerns/problems identified and included in this study by City staff are summarized in Table 6-2, entitled List of Drainage Concerns/Problems from City Staff, and Figure 6-4, entitled Map of Drainage Issues Identified by City Staff. (Note: The 19 drainage issues identified by City staff in Table 6-2 and Figure 6-4 have been reviewed and 3 have been omitted or combined to form the resulting 16 problems listed as being identified by City staff in Table 6-1.)

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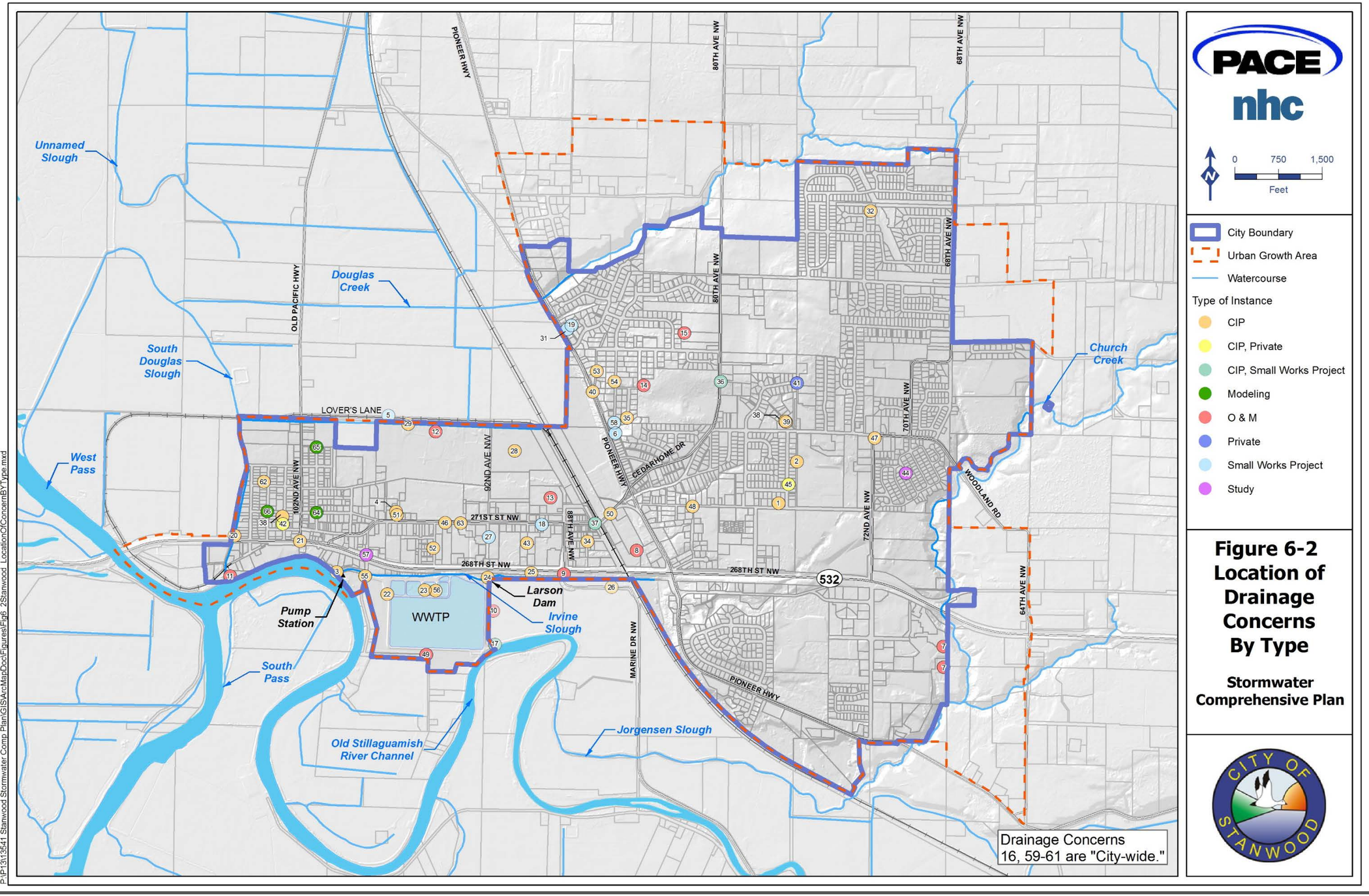
PACE
nhc
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750
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Feet
City Boundary
Urban Growth Area
Watercourse
Type of Instance
CIP
CIP, Private
CIP, Small Works Project
Modeling
O & M
Private
Small Works Project
Study
Unnamed Slough
Douglas Creek
South Douglas Slough
West Pass
South Pass
Pump Station
WWTP
Larson Dam
Irvine Slough
Old Stillaguamish River Channel
Jorgensen Slough
Church Creek
PIONEER HWY
OLD PACIFIC HWY
LOVER'S LANE
80TH AVE NW
68TH AVE NW
70TH AVE NW
72ND AVE NW
64TH AVE NW
102ND AVE NW
92ND AVE NW
88TH AVE NW
271ST ST NW
268TH ST NW
532
CEDARHOME DR
WOODLAND RD
MARINE DR NW
Drainage Concerns
16, 59-61 are "City-wide."
Figure 6-2
Location of Drainage Concerns By Type
Stormwater Comprehensive Plan
CITY OF STANWOOD
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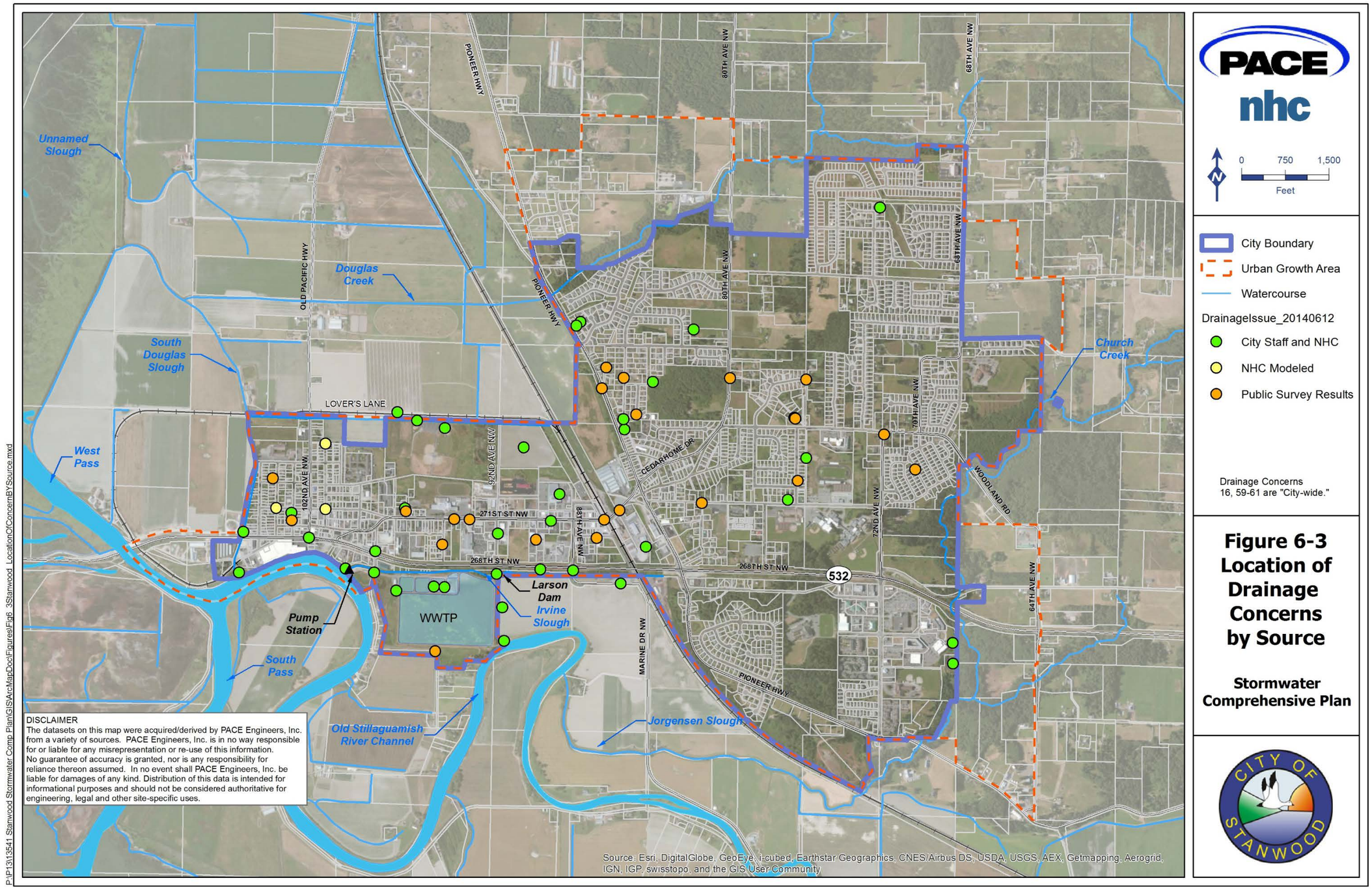
PACE
nhc
0 750 1,500
Feet
City Boundary
Urban Growth Area
Watercourse
DrainageIssue_20140612
City Staff and NHC
NHC Modeled
Public Survey Results
Drainage Concerns
16, 59-61 are "City-wide."
Figure 6-3
Location of Drainage Concerns by Source
Stormwater Comprehensive Plan
CITY OF STANWOOD
Unnamed Slough
Douglas Creek
South Douglas Slough
West Pass
South Pass
Pump Station
WWTP
Larson Dam
Irvine Slough
Old Stillaguamish River Channel
Jorgensen Slough
Church Creek
PIONEER HWY
OLD PACIFIC HWY
LOVER'S LANE
102ND AVE NW
92ND AVE NW
271ST ST NW
268TH ST NW
88TH AVE NW
80TH AVE NW
68TH AVE NW
70TH AVE NW
72ND AVE NW
64TH AVE NW
CEDARHOME DR
WOODLAND RD
MARINE DR NW
532
DISCLAIMER
The datasets on this map were acquired/derived by PACE Engineers, Inc. from a variety of sources. PACE Engineers, Inc. is in no way responsible for or liable for any misrepresentation or re-use of this information. No guarantee of accuracy is granted, nor is any responsibility for reliance thereon assumed. In no event shall PACE Engineers, Inc. be liable for damages of any kind. Distribution of this data is intended for informational purposes and should not be considered authoritative for engineering, legal and other site-specific uses.
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
P:\P13\13541 Stanwood Stormwater Comp Plan\GIS\ArcMapDoc\Figures\Fig6_3Stanwood_LocationOfConcernBYSource.mxd

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Table 6-2: List of Drainage Concerns/Problems from City Staff

ID	Address	Description	Problem Type	Project Type
1	76th Dr NW & 272nd St NW	Backyards on 76th Dr. NW Flood from Water runoff from 272nd St NW	Flooding	CIP
2	76th Dr NW & 276th St NW	Backyards on 76th Dr. NW Flood During Heavy Rain	Flooding	CIP
3	268th St NW & Floe Rd	The dike is low in this area and needs to be built up, there are sand bags in place now.	Flooding	CIP
4	96th NW & 271st St NW	House on 96th next to the library, the yard floods during a flood event.	Flooding	CIP
5	Lovers Rd/276th St NW	Lovers Lane 276th water ponds up on side of roadway across from Heritage Park on the north side of the road.	Flooding	CIP
6	Pioneer Hwy & 85th Dr. NW	Water runoff from the street in heavy rain events washes the shoulder of the roadway down the hill on 85th Dr. NW into Pioneer Hwy	Erosion	CIP
7	276th St NW & 265th St NW	Lindstrom Ponds 1 & 2 are full of Alder Trees that need to be removed.	O&M Referral	O&M Referral
8	Cedarhome Dr. & Triangle Dr.	Vegetation Area behind Carlson Trucking need to be Cleaned	O&M Referral	O&M Referral
9	88th Ave NW & 268th St NW	Irvine Slough needs vegetation cut back from 92nd to Florence Drive	O&M Referral	O&M Referral
10	92nd Ave NW & 268th St NW	Ditch along farm field needs to be cleaned	O&M Referral	O&M Referral
11	Camano Gateway Bridge & Saratoga Dr	Flood gate for south Douglas Slough needs to be cleaned.	O&M Referral	O&M Referral
12	99th Ave NW & 272nd Pl NW	Ditch next to walking trail needs to be cleaned.	O&M Referral	O&M Referral

Table 6-2: List of Drainage Concerns/Problems from City Staff

ID	Address	Description	Problem Type	Project Type
13	271st St NW & Marine Dr	Ditch from R&R tracks to farm field behind Skagit farmers needs to be cleaned	O&M Referral	O&M Referral
14	84th Ave NW & 278th St NW	Ditch on 84th & 278th needs to be cleaned out.	O&M Referral	O&M Referral
15	82nd Dr NW & 282st St NW	The ditch on 80th & through the farm field runs into a small pipe & gets plugged often and flood the yards on 82nd.	O&M Referral	O&M Referral
16	Citywide	All ditches citywide need to be cleaned. The ditch on Lovers Lane, the ditch by the Amtrak Station and the ditch on 72nd from 272nd to 276th are the only ditches that have been cleaned in the last several years.	O&M Referral	O&M Referral
17	92nd Ave NW & 268th St NW	Seven Tubes - 1 gate is completely gone and needs to be replaced. All other 6 tubes need to be replaced due to hold in pipes and gates are old.	Small Works Project	Small Works Project
18	90th Ave NW & 271st St NW	270th St drain pipe under roadway is collapsed	Failed Infrastructure	Small Works Project
19	Lund Hill Rd & Nordic Way	Pioneer Hills south pond control structure is broke and is need of repair.	Failed Infrastructure	Small Works Project

Note: Drainage concerns noted on 1/14/2014.

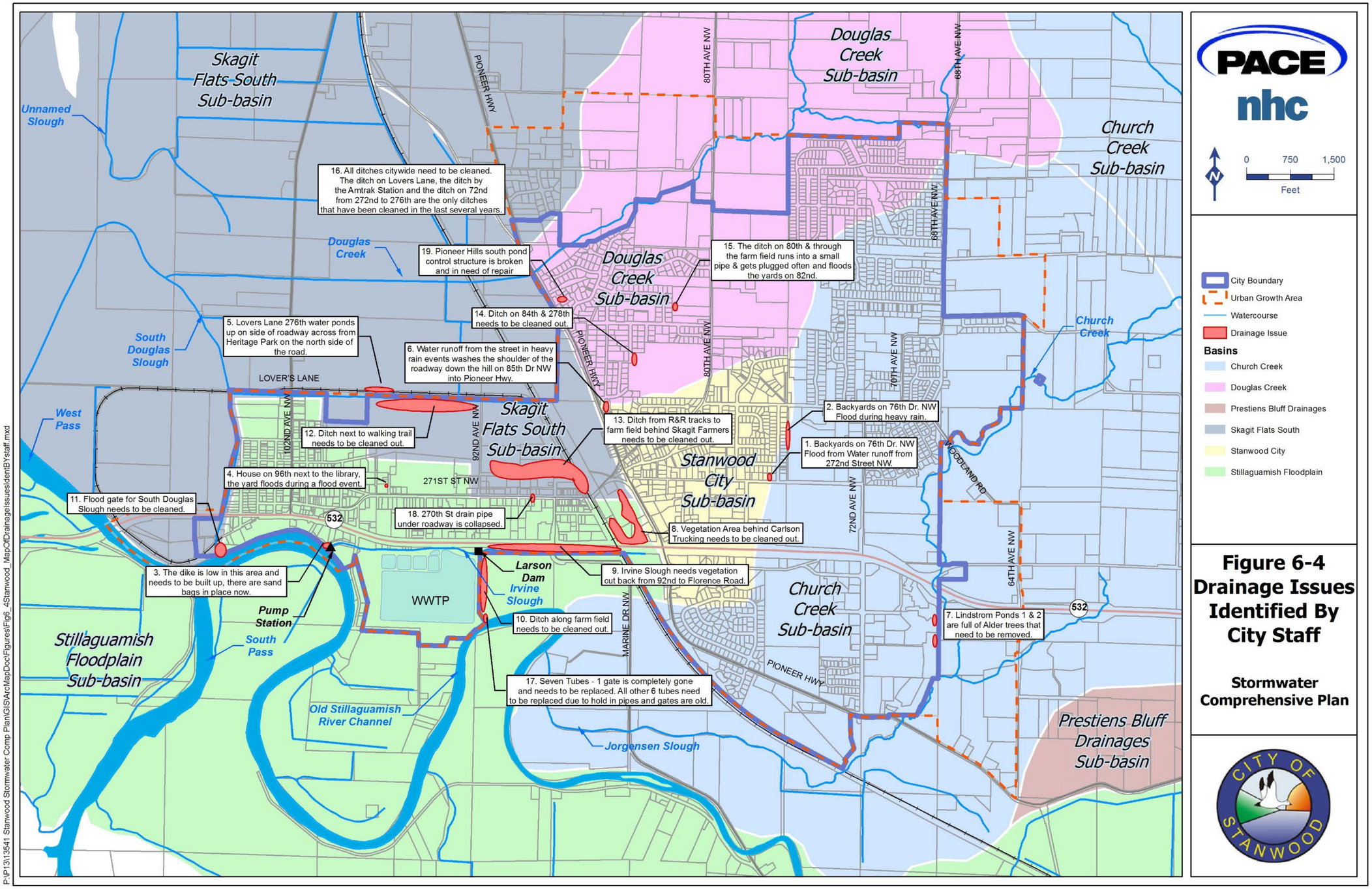

Figure 6-4 Drainage Issues Identified By City Staff

Stormwater Comprehensive Plan

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These entries from City staff (from Table 6-2 and Figure 6-4) were compiled and included in the Master List of Drainage Problems (presented previously in Table 6-1), then progressed into the ranking and rating process, as described below.

6.4 ESTABLISH RATING AND RANKING CRITERIA (STEP #3)

Discussions with City staff resulted in a set of criteria for the rating and ranking of drainage problems (as presented earlier in Table 6-1). The criteria consist of four general categories with each category being divided into one or more subcategories, as shown in Table 6-3 and listed below.

- *Nature of the Flood Hazard:* Damage to infrastructure (0-5 pts), flood source (0-5 pts), flood duration (0-5 pts) and flood frequency (0-5 pts); each of the four sub-criteria have a weight factor of 3, so that possible points for each sub-category would be 15 points; total points in this category is equal to 60 pts.
- *Environmental Impacts:* Water quality (0-5 pts), stream bank erosion (0-5 pts), hillside erosion (0-5 pts), and in-stream habitat (0-5 pts); each of these four sub-criteria have a weight factor of 1, so that the maximum possible points for each sub-category would be 5 points; total points in this category is equal to 20 pts.
- *Economic Impacts:* Various local and regional economic considerations worth 0-5 pts, with a weight factor of 2, for a total of 10 pts.
- *Community Considerations:* Complaint history (0-5 pts), aesthetics (0-5 pts), and public perception (0-5 pts); each of these three sub-criteria have a weight factor of 2, 1, and 2, respectively, for a total of 25 pts.

Total maximum points for each drainage problem is equal to 115 pts.

Table 6-3: Drainage Concerns - Ranking and Rating Criteria

Criteria Number	General Category	Specific Category	Score Range	Weight	Highest Potential Score
1	Flood Hazard Reduction	Impact to Infrastructure	0 = no impact, 3= impacts private property, 5 = impacts public streets in terms of traffic, infrastructure and public safety	3	15
		Flood Source	0 = no flooding, 3 = Private Water Contributing, 5 = Public Water	3	15
		Flood Duration	0 = 1-6 hours, 3 = 24 hours, 5 = More than 24-hours	3	15
		Flood Frequency	0 = 100-year storm, 3 = 25-year storm, 5 = 6-month storm	3	15
2	Environmental	Water Quality	0 = No Water Quality Concerns, 3 = Minor Water Quality Concerns, 5 = Measurable Water Quality Concerns	1	5
		Stream Bank Erosion	1 = Flood Condition Lasts less than 8 hours, 3 = Flood Condition Lasts 8 hours-24 hours, 5 = Flood Condition Lasts more than 24 hours	1	5
		Hillside Erosion	0 = No Hillside Erosion, 3 = Visible Hillside Erosion, 5 = Hillside Erosion with Impacts to Stream Channel and Downstream Capacity	1	5
		In-stream Habitat	0 = No Habitat impact, 3 = Moderate Impact of Habitats 5 = Heavy Impact of Habitats	1	5

Table 6-3: Drainage Concerns - Ranking and Rating Criteria

Criteria Number	General Category	Specific Category	Score Range	Weight	Highest Potential Score
3	Economic Impact	Economic Impact	0 = No Economic Impacts, 3 = Minor Economic Impacts, 5 = High Economic Impacts, such as Commercial and High Use Areas	2	10
4	Community Considerations	Complaint History	0 = No previous Citizen complaints, 3 = 1 or 2 other Citizen Complaints, 5 = More than 3 Citizen Complaints	2	10
		Aesthetics	0 = No Aesthetics Impacts, 3 = Occasional Negative Aesthetics Impacts (Seasonal), 5 = Constant Negative Aesthetic Impacts	1	5
		Public Perception	0 = No Public Perception this is a Problem, 3 = Public Perception of the Problem, 5 = Significant Public Interest	2	10
				Total	**115**

Additional CIP Project Considerations
1. Utility Responsibility and Ownership
2. Permitting
3. Property Acquisition
4. Design and Construction Feasibility and Challenges

6.5 APPLY RATING AND RANKING CRITERIA AND FORM PRIORITIZED LIST OF DRAINAGE ISSUES/PROBLEMS (STEP #4)

Using the criteria developed in Step 3 above, each of the 66 drainage issues/concerns/problems were rated and ranked; 54 were selected as drainage problem areas. Results of this rating and ranking process were shown previously in the numerically order projects presented in Table 6-1.

6.6 SEPARATE OUT SMALL WORKS, MAINTENANCE ACTIVITIES, AND STUDIES (STEP #5)

One of the outcomes of the rating and ranking process was the elimination of 12 minor drainage issues from the problem category to be addressed by the maintenance crew, leaving the 54 drainage problem areas, as listed in Table 6-1.

6.7 CREATE PRIORITIZED LIST OF RECOMMENDED CAPITAL IMPROVEMENT PROJECTS (STEP #6)

With the separation of the 12 maintenance projects from the list of Master List of Drainage Problems, the top ten CIP projects were identified. Again, this list is presented in Table 6-1 and consists of a total of 54 drainage problems. The problems are presented in a prioritized order based on the number of points assigned to each problem during the rating/rating process. Once again, the top ten problems were ranked high enough to be selected for further engineering analysis and the development of recommended drainage CIP projects.

6.8 CONDUCT MODELING TO VERIFY PROBLEMS AND PROPOSED DESIGNS (STEP #7)

The modeling analyses conducted in this stormwater planning process were specifically focused on the more difficult problem areas where in-depth engineering and flow analyses were needed to better define the problem and/or determine the capacity needed to meet the conveyance needs of the 25-year, 24-hour event. The modeling analyses, as described and presented earlier in Chapter 5, discovered three new problems that were not previously observed by the previous public surveys or staff input. These three drainage problems are listed as Drainage Problems #64, #65 and #66 in Table 6-1 above. Each of these were serious enough and ranked high enough to be included as CIP projects #3, #6, and #7, respectively.

6.9 DEVELOP CIP COST ESTIMATES (STEP #8)

Cost estimates were developed for each of the top ten recommended capital improvement projects. A standardized cost sheet with current unit costs from recent construction projects was prepared and then applied to each of the nine proposed CIP projects, with the tenth CIP project being the ISSSP. The highest priority project, the ISSSP Study Project, was estimated to cost over $1.7M and has been included in the City's updated drainage CIP.

6.10 FINALIZE CAPITAL PROJECTS AND INTEGRATE THEM INTO THE STORMWATER COMPREHENSIVE PLAN (STEP# 9)

This list of the top ten capital projects was finalized and integrated into the updated SWMP presented in Chapter 7. The total cost of the City's updated drainage CIP is estimated to be $8.31M, as summarized below in Section 6.11 and listed in Table 6-4. The cost of the ISSSP Project is unknown, and a result has not been included in the Master List of drainage CIP costs. Individual drainage CIP project sheets and costs have been included in the following section for the top nine projects.

(Note: Following the inclusion of the drainage CIP into the City's updated SWMP, this list of capital projects was presented to the City's outside financial consultant (FCSG) for an analysis and review of service levels, funding options, and rates, and will be presented to the City and public during the future SCP review and approval process.)

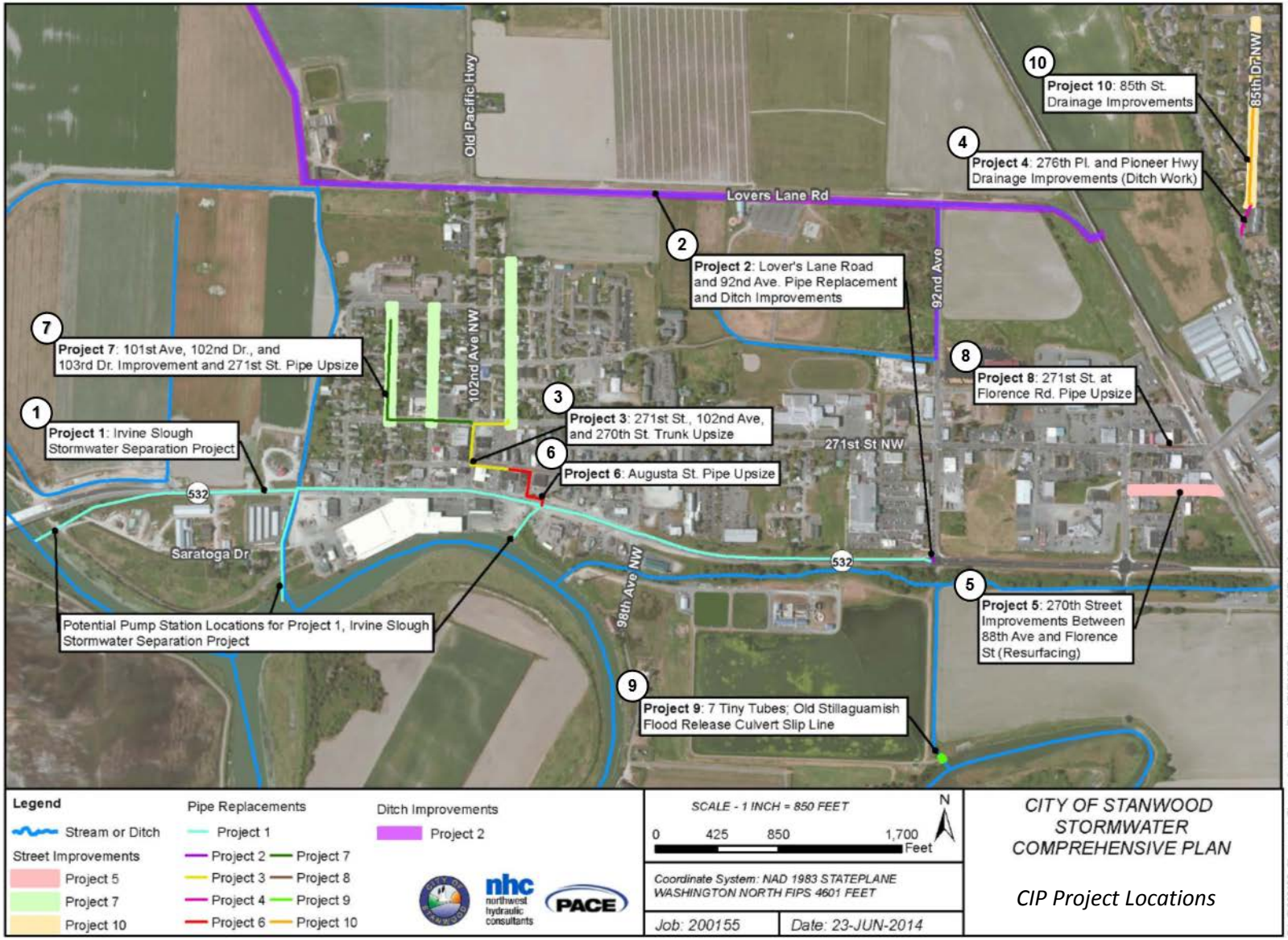
6.11 REVIEW AND APPROVE CAPITAL FACILITY IMPROVEMENTS AND COSTS (STEP #10)

The top ten drainage CIP projects were developed to solve the most significant drainage and flooding problems throughout the City. Each solution was designed to meet a level of service that prevents street flooding in storms more frequent that the 25-year return interval flood. The proposed engineering design options considered included the following: increasing system conveyance (e.g., pipe size), expanding the collection system network, and controlling flow volumes. Ultimately, all of the solutions developed as part of this plan will help to create increased conveyance capabilities within the City's drainage system, or will expand the drainage network into areas that currently either do not have a collection system or have an ineffective collection system.

A summary of the resulting projects and their estimated costs are provided in Table 6-4. The ten projects range in cost from $59,000 to nearly $3.2 million, with nine of the projects totaling $8.31M (all but the ISSSP). The final cost of drainage CIP #1, the ISSSP, will be determined as part of the ISSSP study, which is being funded by a grant in 2015 (project began in 2014). Figure 6-5 shows the location of the ten recommended drainage CIP projects. Within the figure, pipe replacements are shown as lines and street improvements are shown as a shaded right-of-way.

Table 6-4: City of Stanwood - Summary of Recommended CIP Projects and Costs		
CIP Project	**Project Name**	**Total Cost ($)**
#1	Irvine Slough Stormwater Separation Project	Unknown*
#2	92nd Ave at SR 532 Pipe Replacement & Lovers Lane Road Drainage Improvements	$637,366
#3	271st Street NW, 102nd Avenue, and 270th Street NW Trunk Upsize	$499,442
#4	276th Pl. and Pioneer Hwy Drainage Improvements (Ditch Work)	$58,791
#5	270th Street NW Improvements, between 88th Avenue NW and Florence/resurfacing	$373,138
#6	Augusta Street Pipe Upsize	$292,915
#7	101st Avenue, 102nd Drive and 103rd Drive Improvement	$2,111,928
	(Optional) with 271st Street NW Pipe Upsize	$3,248,524
#8	271st Street NW at Florence Rd. Pipe Upsize	$158,642
#9	7 Tiny Tubes; Old Stillaguamish Flood Release Culvert Slip Line	$144,190
#10	85th Drive Drainage Improvements	$788,635
	TOTAL:	**$8,313,571**
Total CIP Cost: $ 8.31M for CIPs #2 through #10, without the ISSSP (CIP #1)		

Figure 6-5: Location of Top Ten Recommended Stormwater CIP Projects



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6.11.1 Incorporation of the ISSSP into the Sizing of CIP Projects #2 through #10

To achieve the desired 25-year conveyance capacity within those areas draining to the Irvine Slough, a project similar to the proposed ISSSP is needed. The proposed ISSSP-type of project would allow the City to lower water levels at the City's outfalls relative to those currently resulting from the operation of the Irvine Slough Pump Station. Dropping the water level in the slough would allow the City's gravity drains to operate much more effectively and reduce flooding within the low-lying parts of the City

The ISSSP type of project would also have a direct impact on the size and performance of all of CIP projects that serve areas currently draining to Irvine Slough. If the ISSSP is not constructed, many of the flooding problems within the City would be more difficult to mitigate. For example, at the City Library site shown in Figure 6-6 at right, the ground elevation is similar to that of the water level in Irvine Slough during flood conditions. Without lowering the water levels at the outfall, mitigation of the flooding at this site would require a complex and expensive solution.

Thus, for all of the CIP projects that are located in subbasins draining to Irvine Slough, it has been assumed that the ISSSP project will be completed. It is also recognized that the ISSSP design may affect the performance of the recommended CIPs, depending on how well the ISSSP controls water levels in the drainage collection system.

Figure 6-6: Area of Flooding Adjacent to Library

Low area adjacent to Library that floods due to limited Irvine Slough capacity.

6.12 PROJECT SUMMARY SHEETS

Project Summary Sheets are provided for each of the developed CIP projects #2 through #10. Each sheet includes a listing of the drainage problem ID numbers (that are addressed by the proposed CIP), a problem description, a project description, design assumptions, project benefits, a project illustration map, and a tabulation of project quantities and costs. Cost estimates in each summary sheet include all costs needed for design and construction. (Per WAC 458-20-171 (Rule 171), Washington State Sales Tax has not been included for Roadway-related storm drainage.)

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6.13 CIP PROJECT #1
IRVINE SLOUGH STORMWATER SEPARATION PROJECT

Drainage Problem ID(s): 4, 57, and others are related.

Problem Description: Since 1990, Irvine Slough has been protected from Stillaguamish River flood waters by a dam at 92nd Avenue NW, the Larson Dam. This dam restricts the volume of floodwater that can enter the slough, allowing only a relatively small amount of water through the dam via a single 36-inch diameter culvert. While the dam helps reduce the amount of floodwater affecting the City's stormwater system, it also causes an increase in flood levels and duration of flooding in the Stillaguamish River floodplain. Additionally, while the dam at 92nd Avenue NW does reduce the volume of floodwaters reaching Irvine Slough, there is still a significant volume of water that reaches the Slough from the river. This volume of floodwater increases water levels in Irvine Slough, limits the capacity of the City's stormwater system to drain into Irvine Slough, and incurs additional pumping costs because river flood waters have to be pumped back into the Old Stillaguamish River channel via the Irvine Slough Pump Station.

Project Description: The Irvine Slough Stormwater Separation Project (ISSSP) is a major capital improvement project that was identified by the 2004 Stillaguamish River Flood Hazard Mitigation Plan as the preferred alternative to reduce flooding from the Stillaguamish River, and also to increase the capacity of the City's stormwater system in areas currently draining to Irvine Slough. The City has secured a grant to study this project and develop alternative and preferred conceptual designs. That work is expected began in 2014. The current objectives for the project are the following:

- Separate the City's stormwater system from Irvine Slough by constructing a new conveyance system on the north side of SR 532 that will route the City's stormwater east to a new pump station and outfall on the east or west side of Twin City Foods. Three potential pump station locations are identified in Figure 6-5 and photos of two of the sites are shown in Figure 6-7 below.
- Improve the capacity of Irvine Slough to convey Stillaguamish River floodwaters.

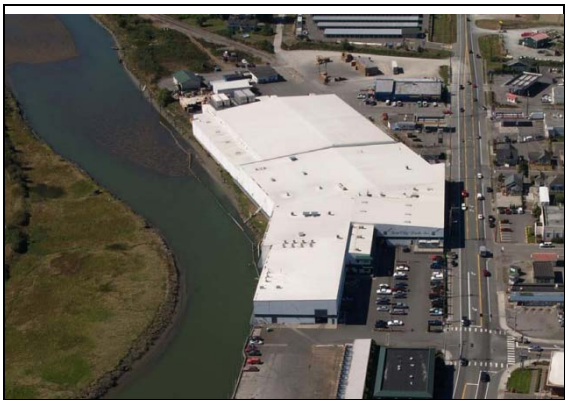
Solutions that are likely to achieve these objectives may include removing the existing dam in Irvine Slough at 92nd Avenue NW (Larson Dam). Since 1990, this dam has restricted the conveyance of floodwaters in the Stillaguamish River floodplain. Other possible solutions may also include reconstructing Irvine Slough as a high-flow bypass channel, and/or removing or modifying the Irvine Slough Pump Station.

The ISSSP is intended to provide a major improvement to the City's stormwater system by reducing the water levels at the City's outfalls, thereby allowing the system to discharge via gravity more freely. The degree of improvement will vary depending on how the ISSSP is designed and operated. For example, a larger pump station and higher capacity channel will be more effective in keeping water levels at the outfalls of the City's drainage system lower than would a smaller pump or

conveyance system. These aspects will need to be determined as part of the ISSSP design and evaluation process.

Figure 6-7: CIP Project #1 – Site of Potential ISSSP Pump Station

Potential ISSSP Pump Station Site to the west of Twin City Foods, taken from the west.



Twin City Foods taken from the east (Photos from Stanwood, 2010).

Design Assumptions:

- Pre-design phase will include an evaluation of various conveyance and flood reduction alternatives, and will be completed as part of the grant in 2014-2015. (Note: Design and construction costs are difficult to predict and have not been estimated at this time.)

Project Benefits: There are many potential benefits from a well-designed and well-operated ISSSP. The ISSSP project aims to reduce the duration of elevated water levels and flooding in the Stillaguamish River floodplain. It will likely accomplish this by increasing the conveyance capacity of the City's stormwater system and providing additional robustness to the City's stormwater system by moving the outfall further west into or nearer to West Pass, rather than continuing to discharge into the Old Stillaguamish Channel where it discharges now. The increases in the capacity of the City's stormwater system will provide full 25-year conveyance to many of the existing systems within the City and address many of the City's existing drainage problems.

Project Illustration Map: Due to the large expanse of this project, CIP #1 is shown as a light blue line on Figure 6-5, the CIP Project Location Map.

Estimated Quantities and Costs: A cost estimate has not been provided for this project. The project is expected to include the construction of 5,000 to 8,000 lineal feet of high capacity pipe or ditch, a new pump station, and re-grading of the existing Irvine Slough channel. These costs are not known at this time. Estimates may be expected to be in the range of $1.5M to $3M, but could be much higher, depending on the selected design option and outfall type and location.

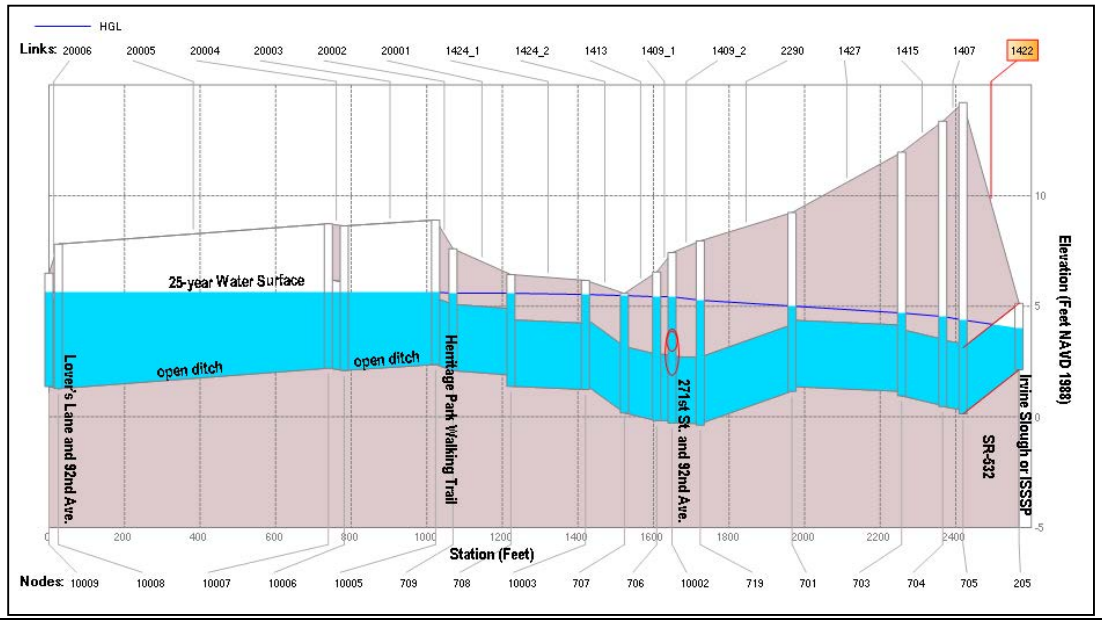
6.14 CIP PROJECT #2
LOVER'S LANE ROAD & 92ND AVENUE NW PIPE REPLACEMENT AND DITCH IMPROVEMENTS

Drainage Problem ID(s): 63, 34, 29, 28, 18, and five other complaints related to Douglas Creek from outside of the UGA.

Problem Description: The areas of flooding related to these two interconnected systems are widespread, and include both frequent flooding of Drainage and Diking District #7 (DD7) agricultural lands north of Lover's Lane Road and occasional street flooding within the 271st Street NW pipe network. Currently, when tide conditions prevent gravity discharge through the six gates that drain the Douglas Creek ditch system (a reversed flow condition), flows from Douglas Creek discharge to the south via the Lover's Lane Road ditch and the 92nd Avenue NW pipe system into Irvine Slough, and also into the South Douglas Slough. During some low tide conditions, the 92nd Avenue NW system does reverse direction and flow north, but the highest flows through the system flow to the south toward the City and Irvine Slough.

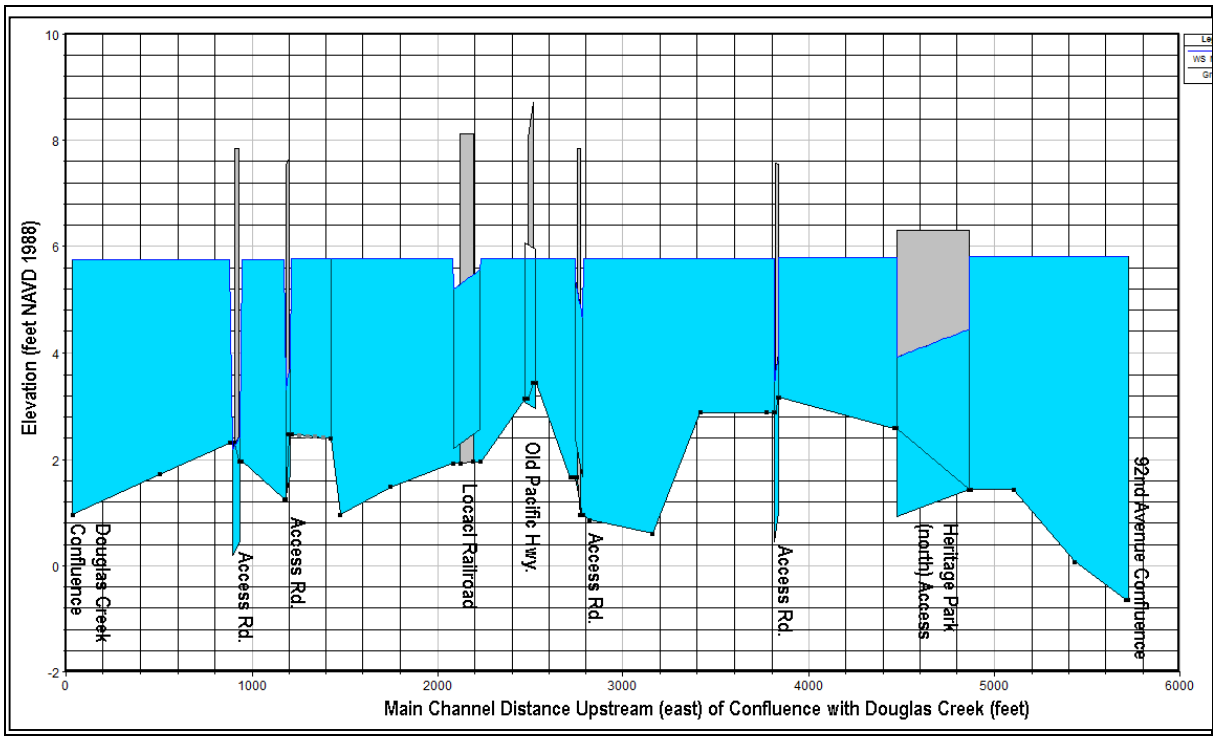
The capacities of the Lover's Lane Road and 92nd Avenue NW systems are both limited by poor ditch and pipe capacity and grades. Profile views of the 92nd Avenue NW system (SWMM model) and the Lover's Lane Road ditch system (HEC-RAS model) are shown in Figure 6-8 and Figure 6-9, respectively. The 25-year flood water surface is shaded blue in both figures.

Figure 6-8: CIP Project #2 – Hydraulic Profile Along 92nd Avenue NW



Hydraulic profile along 92nd Avenue NW between Lover's Lane Road and Irvine Slough, shows the pipe at SR 532 that needs to be replaced.

Figure 6-9: CIP Project #2 – Hydraulic Profile Along Lover's Lane Road



Hydraulic Profile along Lover's Lane Road between 92nd Avenue NW and Confluence with Douglas Creek, shows poorly graded channel and culverts.

The 92nd Avenue NW system (Figure 6-8) is currently graded in two directions. The ditch north of the Heritage Park walking trail near 273rd Street NW is sloped north toward Lover's Lane Road and the pipe system south of the walking trail has a slightly greater slope south toward Irvine Slough. The capacity of the system to flow south is limited by a poorly graded pipe crossing SR 532. That pipe, highlighted as ID 1422 in Figure 6-8, discharges at an elevation of 2.13 feet, while the inlet at the north end of the pipe is at an elevation of 0.13 feet. It is not clear why the pipe was installed with an adverse grade, but lowering the south end of this pipe at the outfall to Irvine Slough by 2.0 feet would increase the capacity of the entire system. In addition to the SR 532 pipe crossing, there is also a low point in the system in the vicinity of 271st Street NW, but model simulations indicate that this is less of a limitation than the SR 532 crossing. The primary concern with the low point near 271st Street NW is sediment accumulation. The system should be regularly cleaned to ensure sediment does not routinely reduce the capacity of the pipe.

The capacity of the Lover's Lane Road ditch system (Figure 6-9) is limited by poor grading and culverts that are either perched, partially buried, or of inadequate diameter.

Project Description: In the 92nd Avenue NW system, the 150-foot long 36-inch-diameter pipe under SR 532 will be replaced to align with the existing system on the north side of SR 532 and slope downward to the constructed ISSSP. This pipe will become the new outfall at the south end of the 92nd Avenue NW drainage system. In the Lover's Lane Road system, the ditch should be regraded and the culvert crossings adjusted to provide an adequate slope. The HEC-RAS model used to evaluate Lover's Lane and 92nd Avenue NW system assumed that sediment was removed from the culverts. It is beyond the scope of this project to determine the needed slope of the ditch and culverts, optimal flow direction, or the optimal volume of discharge that should be routed from Douglas Creek to Irvine Slough via the pipe/ditch system along 92nd Avenue NW. Additionally, there may be a limit to how much capacity can be added to Lover's Lane Road ditch without a major pipe replacement of the 92nd Avenue NW storm drain line. That limitation was not assessed and, aside from the SR 532 crossing, replacement of the pipe along 92nd Avenue NW has not been included in this CIP #2 cost estimate.

Project Benefits: Improving the grades of the ditches and pipes along the 92nd Avenue NW and Lover's Lane Road drainage systems will reduce the frequency of flooding both inside and outside of the City's UGA. The City should also be aware that: a) increasing the capacity of Lover's Lane Road and 92nd Avenue NW could increase the volume of flow that is routed to Irvine Slough (or the ISSSP) from Douglas Creek and increase pumping costs at the downstream pump station, and b) that increasing the capacity of Lover's Lane Road without increasing the capacity of 92nd Avenue NW could aggravate flooding problems in the 271st Street NW system.

Design Assumptions:

- 25-year design standard.
- The ISSSP will be constructed.
- The SR 532 crossing pipe will likely be replaced or eliminated as part of the ISSSP and the cost will vary depending on the design and where the ISSSP drainage system and outfall are located and constructed.
- The existing flap gate at the 92nd Avenue NW outfall to Irvine Slough will be reused.
- Sediment that accumulates in the 92nd Avenue NW pipe near the low point at 271st Street NW will be routinely removed as part of the City's regular maintenance program.
- Surveyed elevations of the Lover's Lane Road culvert inverts provided by Pacific Geomatic Services, Inc. are correct. Due to sediment accumulation in many of the culverts at the time of the survey, the surveyor had to estimate the sediment depth and culvert invert elevations. It is recommended that the Lover's Lane Road culverts be resurveyed prior to final design and more time be taken to confirm the elevation of the culvert inverts.
- Right-of-way purchase and environmental studies are not included.

Project Illustration Map: See Figure 6-10.

Estimated Quantities and Costs: See Table 6-5.

Figure 6-10: CIP Project #2 – Illustration Map

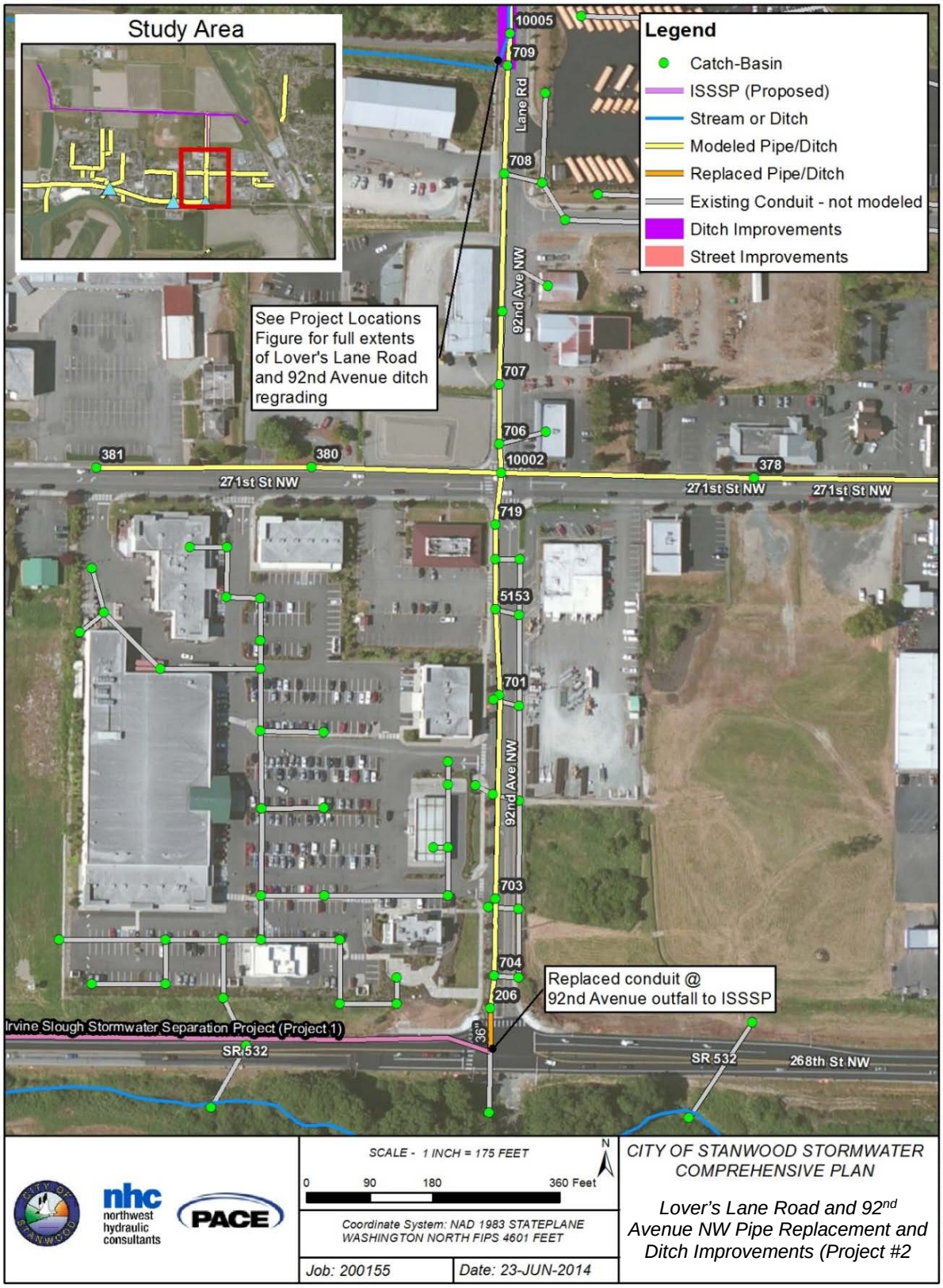


Table 6-5: CIP Project #2 Costs

Item	Description	Estimated Quantity	Unit	Unit Cost	Total
1	SPCC Plan	1	LS	$5,000.00	$5,000.00
2	Temporary Traffic Control	1	LS	$20,000.00	$20,000.00
3	Mobilization	1	LS	$55,000.00	$55,000.00
4	Ditch Excavation	3100	CY	$30.00	$93,000.00
5	Fine Grading	9722	SY	$7.00	$68,055.56
6	Remove and Dispose of Existing Pavement	125	SY	$12.50	$1,562.50
7	Removal and Disposal of Existing Storm Sewer Pipe	150	LF	$15.00	$2,250.00
8	Crushed Surfacing Top Course	1300	TON	$25.00	$39,000.00
9	HMA Cl 1/2" PG-64–22 — 6" Depth	43	TON	$175.00	$7,473.96
10	Storm Sewer Pipe, 36" Diameter	150	LF	$140.00	$21,000.00
11	Culvert, 12" Diameter	108	LF	$75.00	$8,100.00
12	Culvert, 24" Diameter	602	LF	$120.00	$72,240.00
13	Culvert, 36" Diameter	214	LF	$200.00	$42,800.00
14	Type II Catch Basin-54" Diameter	1	EA	$4,500.00	$4,500.00
15	Connection to Existing Drainage Structure/Pipe	1	EA	$500.00	$500.00
16	Rip-Rap for Outfall Protection	5	Ton	$40.00	$200.00
17	Bank Run Gravel for Pipe Zone Backfill	512	Ton	$30.00	$15,369.06
18	Erosion Control and Water Pollution Control	1	LS	$15,000.00	$15,000.00

Subtotal	$471,051.07
Contingency (30%)	$141,315.32
TOTAL CONTRACT COST	$612,366.39
Engineering/Permitting/Construction Management	$25,000.00
Total Project Cost	**$637,366.39**

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6.15 CIP PROJECT #3
271ST STREET NW, 102ND AVENUE NW, AND 270TH STREET NW TRUNK UPSIZE

Drainage Problem ID(s): 64

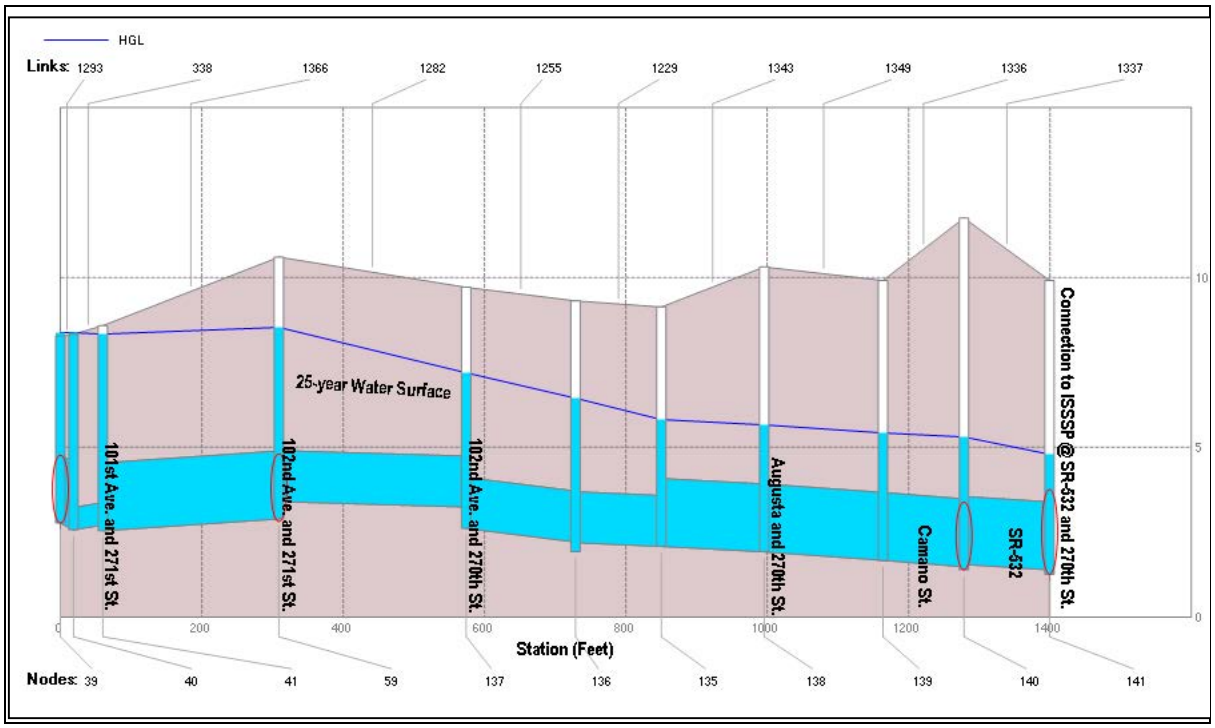
Problem Description: The stormwater system in the portion of the City within modeling Areas 1-3, north of 271st Street NW, is severely limited by an 8-inch pipe that crosses 271st Street NW at 101st Avenue NW (see Figure 6-11) and is partially limited by undersized pipes along 271st Street NW, 102nd Avenue NW, and 270th Street NW. As a result, water levels in the stormwater system back up along 100th Avenue NW, 101st Avenue NW, 102nd Drive NW, and 103rd Drive NW, causing flooding at many locations along these roads during the 25-year flood, including flooding at the intersection of 271st Street NW and 102nd Avenue NW. Figure 6-12 shows a profile view of this portion of the existing stormwater system. The profile begins at the intersection of 102st Avenue NW and 271st Street NW on the left side of the figure and ends at the outfall to the ISSSP on the right side of the figure. Flooding seen at node 39 on the figure extends further north, beyond the extents of the profile.

Figure 6-11 CIP Project #3 – 271st Street NW Photos

Photo looking south across 271st Street NW at 101st Avenue NW, location of 8" pipe limiting capacity.

Photo of catch basin ID #40 at intersection of 271st Street NW and 101st Avenue NW showing 24" and 8" pipe in same structure (May 26, 2014).

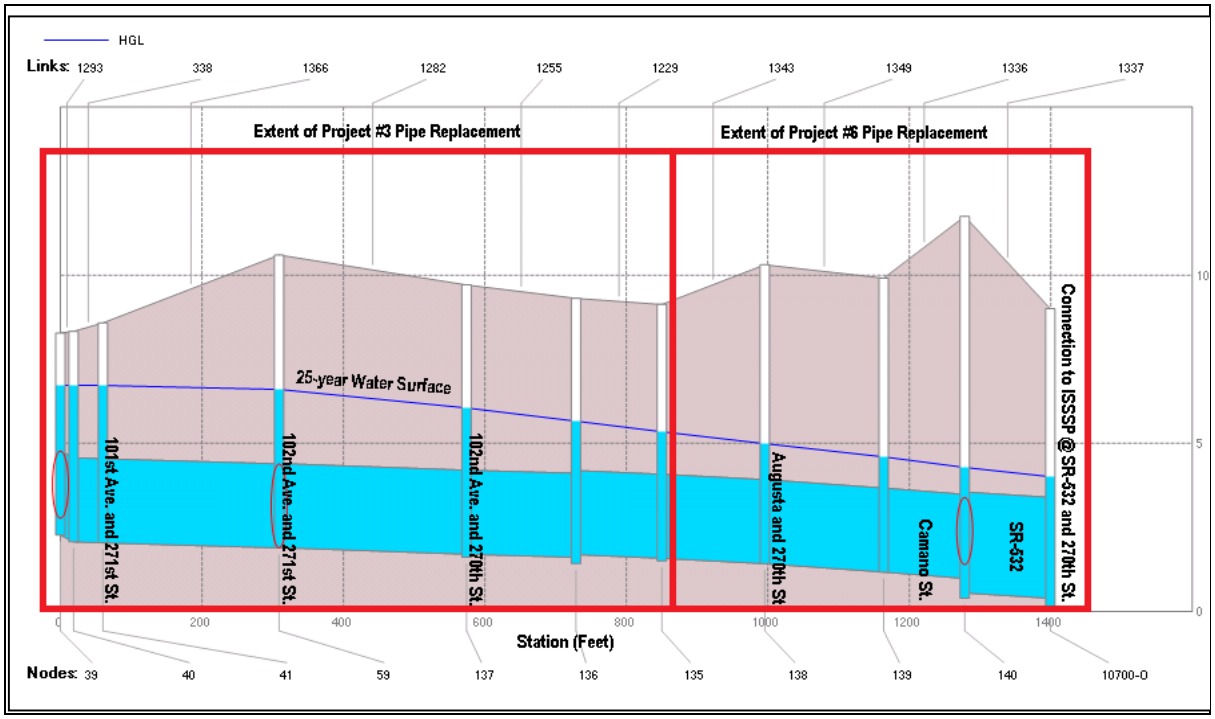
Figure 6-12: CIP Project #3 – Hydraulic Profile #1 Without System Improvements



Hydraulic profile along 271st Street NW, 102nd Avenue NW, and 270th Street NW, showing sections of stormwater system that need to be upsized to provide 25-year conveyance capacity.

Project Description: This project will increase conveyance by replacing pipes along 271st Street NW between 101st and 102nd Avenues NW, along 102nd Avenue NW between 270th and 271st Streets NW, and along 270th Street NW between 102nd Avenue NW and Augusta Street. (Note: Augusta Street is located between 270th Street NW and 268th Street NW, just to the west of the intersection of Camano Street with 268th Street NW.) The extents of this reach are included in the left red box on the profile in Figure 6-13 and are highlighted in orange in Figure 6-14. In total, this project will install about 832 feet of new 30-inch pipe and associated catch basins. The project will connect to Project #6 at its most downstream end.

Figure 6-13: CIP Project #3 – Hydraulic Profile #2 Following System Improvements



Hydraulic profile along 271st Street NW, 102nd Avenue NW, and 270th Street NW, showing improvements to stormwater system.

Project Benefits: If implemented with Projects #6 and #7, this project will eliminate flooding on 100th Avenue NW, 101st Avenue NW, 102nd Drive NW, and 103rd Drive NW during the 25-year flood. If Project #6 is not constructed, this project would reduce the frequency of flooding on 100th and 101st Avenues NW, but not eliminate it. Projects #3, #6, and #7 are all needed to eliminate flooding on 103rd Drive NW.

Design Assumptions:

- 25-year design standard.
- The ISSSP will be constructed.
- Curb, gutter, and sidewalk will need to be removed and replaced on 271st and 270th Streets NW.
- 3 feet of pipe cover will be provided.
- Right-of-way purchase and environmental studies are not included.

Project Illustration Map: See Figure 6-14.

Estimated Quantities and Costs: See Table 6-6.

Figure 6-14: CIP Project #3 – Illustration Map

Table 6-6: CIP Project #3 Costs

Item	Description	Estimated Quantity	Unit	Unit Cost	Total
1	SPCC Plan	1	LS	$1,000.00	$ 1,000.00
2	Temporary Traffic Control	1	LS	$15,000.00	$15,000.00
3	Mobilization	1	LS	$22,000.00	$22,000.00
4	Remove and Dispose of Existing Pavement	693	SY	$12.50	$ 8,666.67
5	Removal and Disposal of Existing Storm Sewer Pipe	832	LF	$15.00	$12,480.00
6	Removal and Disposal of Existing Curb and Gutter*	500	LF	$ 5.00	$2,500.00
7	Removal and Disposal of Existing Sidewalk*	278	SY	$12.50	$3,472.22
8	Crushed Surfacing Top Course**	1,081	TON	$30.00	$32,423.96
9	HMA Cl 1/2" PG-64–22 — 4" Depth	147	TON	$175.00	$25,757.72
10	Concrete Curb Ramps*	2	EA	$2,000.00	$4,000.00
11	Concrete Sidewalk*	278	SY	$40.00	$11,111.11
12	Storm Sewer Pipe, 30" Diameter	832	LF	$125.00	$104,000.00
13	Type II Catch Basin, 54" Diameter	6	EA	$4,500.00	$27,000.00
14	Connection to Existing Drainage Structure/Pipe	1	EA	$500.00	$500.00
15	Bank Run Gravel for Pipe Zone Backfill	437	Ton	$30.00	$13,120.64
16	Erosion Control and Water Pollution Control	1	LS	$2,500.00	$2,500.00
17	Concrete Curb and Gutter*	500	LF	$25.00	$12,500.00

Subtotal	$298,032.32
Contingency (30%)	$89,409.70
TOTAL CONTRACT COST	$387,442.02
Engineering/Permitting/Construction Management	$112,000.00
Total Project Cost	**$499,442.02**

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6.16 CIP PROJECT #4
276TH PLACE NW AND PIONEER HIGHWAY DRAINAGE IMPROVEMENTS (DITCH WORK)

Drainage Problem ID(s): 6 and 58

Problem Description: Runoff from 85th Drive NW flows south toward Pioneer Highway, collects on the east shoulder of 276th Place NW, and flows down the hill to Pioneer Highway. These uncontrolled flows often cause erosion on the shoulder of the road and icy road conditions during freezing weather. This erosion is recurrent and causes unnecessary maintenance costs. The collective water-quality impairment, maintenance concerns, and safety issues at this site make this a high priority CIP project.

Project Description: The project will construct approximately 250 feet of asphalt-lined ditch along the east side of 276th Place NW and will collect runoff at the intersection of 276th Place NW and 85th Drive NW. Collected water will be conveyed down the slope to the existing Pioneer Highway stormwater system and discharged. The alignment is shown in Figure 6-16, at the south end of other improvements along 85th Drive NW which are prescribed as part of Project #10.

The ditch will be connected to an existing catch basin on Pacific Highway via a short 10-foot-long, 18-inch-diameter inlet pipe. The photo in Figure 6-15 is looking down the slope where the new ditch will be constructed. There is an existing catch basin at the top of the slope, on the southeast corner of the intersection of 276th Place and 85th Avenue NW, about 10 feet off of the roadway. This catch basin will need to be integrated into the ditch alignment as part of final design of this solution.

Figure 6-15: CIP Project #4 – Looking South Along Proposed Ditch Alignment

Looking south along proposed ditch alignment on 276th Place NW from 85th Drive NW (April 25, 2014).

Project Benefits: This project will reduce maintenance costs associated with erosion, improve water-quality impairment associated with the transport of eroded material, and improve safety by keeping water and ice off of the traveled roadway. The project will also serve as the downstream conveyance path for Project #10 when constructed.

Design Assumptions:

- 25-year design standard.
- The ISSSP will be constructed.
- The constructed ditch will be 18" deep, with a 3' wide bottom width, and 3:1 side slopes.
- The ditch will be lined with 4" thick asphalt.
- 9-inch-high x 2-foot-wide check dams will be constructed at a 20-foot spacing.
- Right-of-way purchase and environmental studies are not included.

Project Illustration Map: See Figure 6-16.

Estimated Quantities and Costs: See Table 6-7.

Figure 6-16: CIP Projects #4 and #10 – Illustration Map

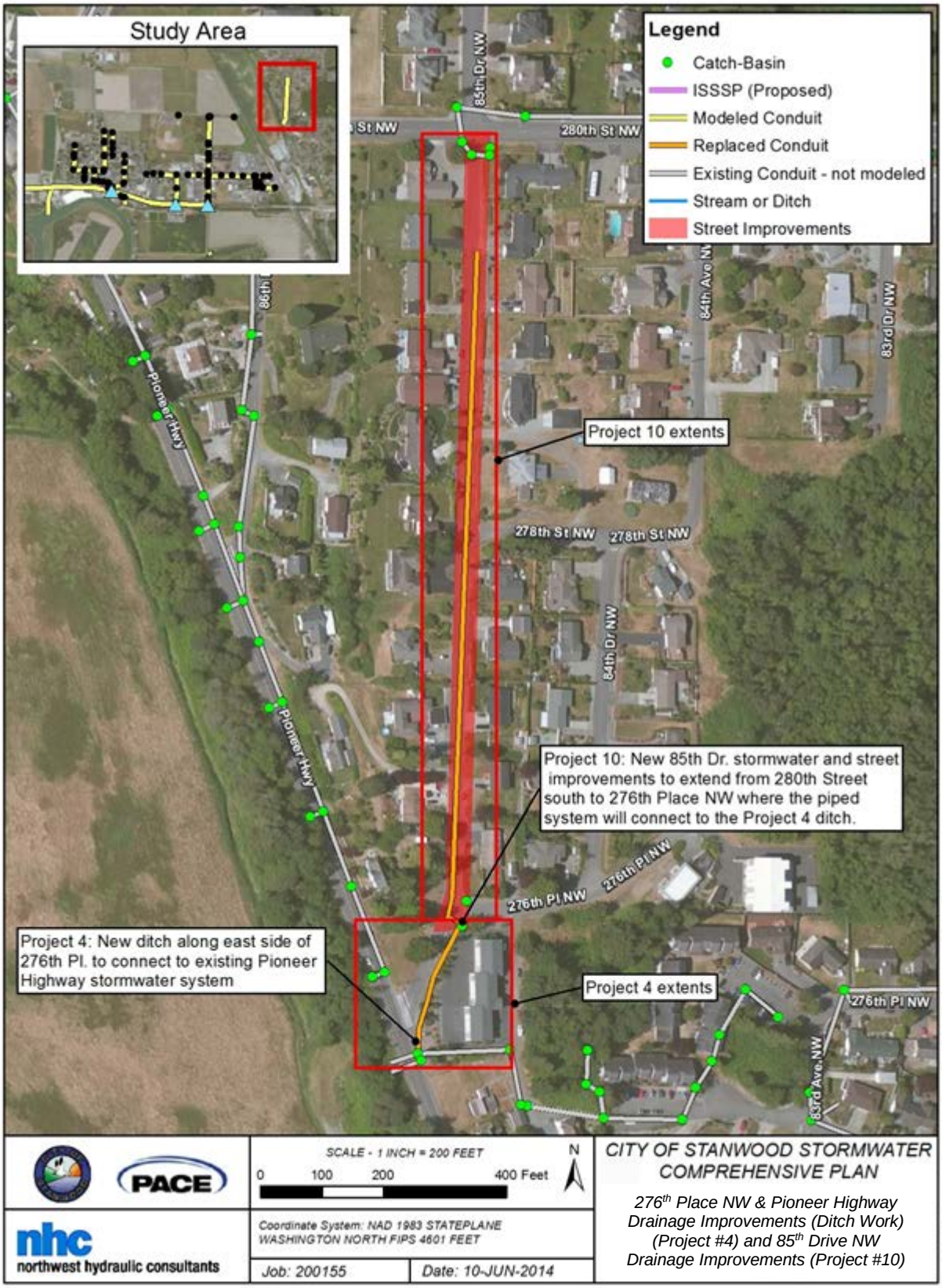


Table 6-7: CIP Project #4 Costs

Item	Description	Estimated Quantity	Unit	Unit Cost	Total
1	SPCC Plan	1	LS	$1,000.00	$1,000.00
2	Temporary Traffic Control	1	LS	$5,000.00	$5,000.00
3	Mobilization	1	LS	$3,000.00	$3,000.00
4	Ditch Excavation	149	CY	$30.00	$4,472.22
5	Fine Grading	319	SY	$7.00	$2,236.11
6	Asphalt Ditch Lining w/ Check Dams	75	TON	$175.00	$13,129.98
7	Crushed Surfacing Top Course	36	TON	$30.00	$1,091.26
8	Connection to Existing Drainage Structure/Pipe	1	EA	$500.00	$500.00
9	Bank Run Gravel for Pipe Zone Backfill	2	Ton	$28.00	$56.00
10	Storm Sewer Pipe, 18-inch Diameter	10	LF	$70.00	$700.00
11	Erosion Control and Water Pollution Control	1	LS	$2,500.00	$2,500.00

Subtotal	$33,685.58
Contingency (30%)	$10,105.67
TOTAL CONTRACT COST	$43,791.25
Engineering/Permitting/Construction Management	$15,000.00
Total Project Cost	**$58,791.25**

6.17 CIP PROJECT #5
270TH STREET NW IMPROVEMENTS, BETWEEN 88TH AVENUE NW & FLORENCE DRIVE/RESURFACING

Drainage Problem ID(s): 18

Problem Description: The storm drainage system on 270th Street NW, between 88th Avenue NW and Florence Drive, is ineffective at collecting runoff from the right-of-way and surface ponding occurs frequently as a result (see an example of such ponding in Figure 6-17 below). Additionally, there is at least one pipe that is crushed and in need of replacement which crosses 270th Street NW near 87th Avenue NW.

Figure 6-17: CIP Project #5 – Looking West Showing Some Surface Ponding

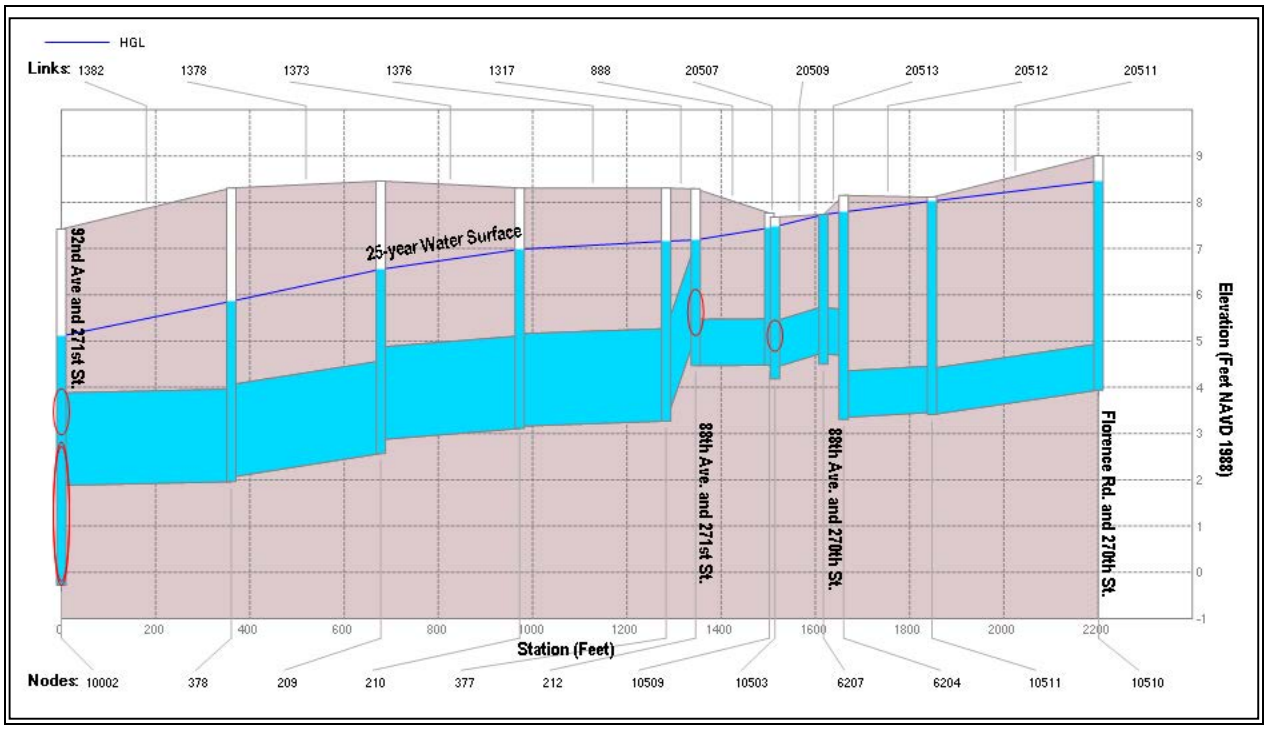
Photo looking west along 270th Street NW from Florence Drive, shows some surface ponding at shoulder of roadway (April 25, 2014).

Project Description: A separate City project is proposed to design street improvements along 270th Street NW that includes improved stormwater drainage elements. The extent of those street improvements are shaded in red in Figure 6-19. The 60% design drawings for the project, by the Blue Line Group, indicate that the stormwater system on 270th Street NW currently is graded to the west, but the intended outlet is not currently known. We recommend that the City select a drainage direction that is consistent with the designed ISSSP and other drainage needs in this portion of the City. The system could be designed to flow in three different directions: to the west; either north on 88th Avenue NW to 271st Street NW, or to the south on 88th Avenue NW to an extended version of the ISSSP; or east to Florence Drive and then south to Irvine Slough or the ISSSP.

For the purposes of this CIP estimate, we have assumed that 270th Street NW will continue to drain to the west and then north on 88th Avenue NW to 271st Street NW, as shown in Figure 6-19. There are some irregularities in the 88th Avenue NW profile, specifically where the system on 88th Avenue NW is higher than on 270th Street NW. However, even with this odd profile (shown in Figure 6-18), the existing system has capacity to convey flows from the 25-year storm, so no pipe replacements are included in this CIP project. While not included in the cost estimate for this

project, the pipes should be corrected if 88th Avenue NW is ever improved for reasons other than improving system capacity.

Figure 6-18: CIP Project #5 – Hydraulic Profile Along 270th Street NW



Hydraulic profile along 270st Street NW between Florence Drive and 88th Avenue NW, and 88th Avenue NW south of 271st Street NW, no pipe replacements are required to achieve conveyance of the 25-year storm.

Project Benefits: This project will improve the collection of drainage on 270th Street NW and correct existing failures in the system. The project has already reached 60% design under a separate City design contract.

Design Assumptions:

- 25-year design standard.
- The ISSSP will be constructed.
- No pipe replacements on 88th Avenue NW are needed to provide 25-year conveyance capacity for the system.
- Project activities will be limited to work on 270th Street NW.
- Right-of-way purchase and environmental studies are not included.

Project Illustration Map: See Figure 6-19.

Estimated Quantities and Costs: See Table 6-8.

Figure 6-19: CIP Project #5 and #8 – Illustration Map

Table 6-8: CIP Project #5 Costs

Item	Description	Estimated Quantity	Unit	Unit Cost	Total
1	SPCC Plan	1	LS	$1,000.00	$1,000.00
2	Temporary Traffic Control	1	LS	$20,000.00	$20,000.00
3	Mobilization	1	LS	$9,000.00	$9,000.00
4	Remove and Dispose of Existing Pavement	2,500	SY	$12.50	$31,250.00
5	Removal and Disposal of Existing Storm Sewer Pipe	625	LF	$15.00	$9,375.00
8	Crushed Surfacing Top Course	751	TON	$30.00	$22,535.67
9	HMA Cl 1/2" PG-64–22 — 4" Depth	569	TON	$175.00	$99,553.13
13	Storm Sewer Pipe, 24" Diameter	625	LF	$90.00	$56,250.00
14	Type II Catch Basin, 48" Diameter	2	EA	$4,500.00	$9,000.00
15	Connection to Existing Drainage Structure/Pipe	1	EA	$500.00	$500.00
16	Bank Run Gravel for Pipe Zone Backfill	228	TON	$30.00	$6,834.72
17	Erosion Control and Water Pollution Control	1	LS	$2,500.00	$2,500.00

Subtotal	$267,798.52
Contingency (30%)	$80,339.56
TOTAL CONTRACT COST	$348,138.08
Engineering/Permitting/Construction Management	$25,000.00
Total Project Cost	**$373,138.08**

6.18 CIP PROJECT #6
AUGUSTA STREET PIPE UPSIZE

Drainage Problem ID(s): 65

Problem Description: This project is an extension of Project #3. Project #3 will improve the capacity of the system and eliminate some of the flooding along 100th and 101st Avenues NW, but some locations at the northern ends of 100th Avenue NW, 101st Avenue NW, and 103rd Drive NW will continue to flood during the 25-year flood. The existing hydraulic profile along this reach is shown in Figure 6-20, with Project #3.

Project Description: This project will construct a new 30-inch pipe along Augusta Street between 270th Street NW and the proposed outfall at the ISSSP along SR 532, extending the new 30-inch pipe placed as part of Project #3 to the north. The location of this project is shown adjacent to Project #3 in Figure 6-5.

Project Benefits: This project will eliminate flooding on 100th Avenue NW and 101st Avenue NW in the 25-year flood, but some flooding will still occur on 103rd Drive NW. That flooding along 103rd Drive NW will be addressed with Project #7.

Design Assumptions:

- 25-year design standard.
- The ISSSP and Project #3 will be constructed.
- It is assumed that curb, gutter, and sidewalk will need to be removed and replaced on 270th Street NW.
- 3 feet of pipe cover will be provided.
- Right-of-way purchase and environmental studies are not included.

Project Illustration Map: See Figure 6-20.

Estimated Quantities and Costs: See Table 6-9.

Figure 6-20: CIP Project #6 – Augusta Street Pipe Upsize

Table 6-9: CIP Project #6 Costs

Item	Description	Estimated Quantity	Unit	Unit Cost	Total
1	SPCC Plan	1	LS	$1,000.00	$1,000.00
2	Temporary Traffic Control	1	LS	$5,000.00	$5,000.00
3	Mobilization	1	LS	$22,000.00	$22,000.00
4	Remove and Dispose of Existing Pavement	389	SY	$12.50	$4,866.67
5	Removal and Disposal of Existing Storm Sewer Pipe	470	LF	$15.00	$7,050.00
6	Removal and Disposal of Existing Curb and Gutter	150	LF	$5.00	$750.00
7	Removal and Disposal of Existing Sidewalk	83	SY	$12.50	$1,041.67
8	Crushed Surfacing Top Course	607	TON	$30.00	$18,200.27
9	HMA Cl 1/2" PG-64–22 — 3" Depth	67	TON	$175.00	$11,639.44
10	Concrete Curb Ramps	1	EA	$1,500.00	$1,500.00
11	Concrete Sidewalk	83	SY	$40.00	$3,333.33
12	Storm Sewer Pipe, 30" Diameter	428	LF	$125.00	$53,500.00
13	Storm Sewer Pipe, 36" Diameter	42	LF	$140.00	$5,880.00
14	Type II Catch Basin-54" Diameter	5	EA	$4,500.00	$22,500.00
15	Connection to Existing Drainage Structure/Pipe	2	EA	$500.00	$1,000.00
16	Bank Run Gravel for Pipe Zone Backfill	244	Ton	$30.00	$7,308.16
17	Erosion Control and Water Pollution Control	1	LS	$5,000.00	$5,000.00
18	Concrete Curb and Gutter	150	LF	$25.00	$3,750.00

Subtotal	$175,319.54
Contingency (30%)	$52,595.86
TOTAL CONTRACT COST	$227,915.40
Engineering/Permitting/Construction Management	$65,000.00
Total Project Cost	**$292,915.40**

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6.19 CIP PROJECT #7
101ST AVENUE NW, 102ND DRIVE NW, AND 103RD DRIVE NW IMPROVEMENT AND 271ST STREET NW PIPE UPSIZE

Drainage Problem ID(s): 66

Problem Description: The collection systems in several streets in the west end of downtown Stanwood (101st Avenue NW, 102nd Drive NW, and 103rd Drive NW) are not effective at preventing flooding of streets and yards because runoff cannot reach the stormwater system. Even in locations where the system has available capacity, a flow path does not exist for ponded water to get into the stormwater system. Figure 6-21 shows ponding on the shoulder of 101st Avenue NW and an example of a catch basin that is not able to capture runoff from the roadway. More substantial ponding than that shown in Figure 6-21 was observed in these areas by City staff during the January 2014 storm events.

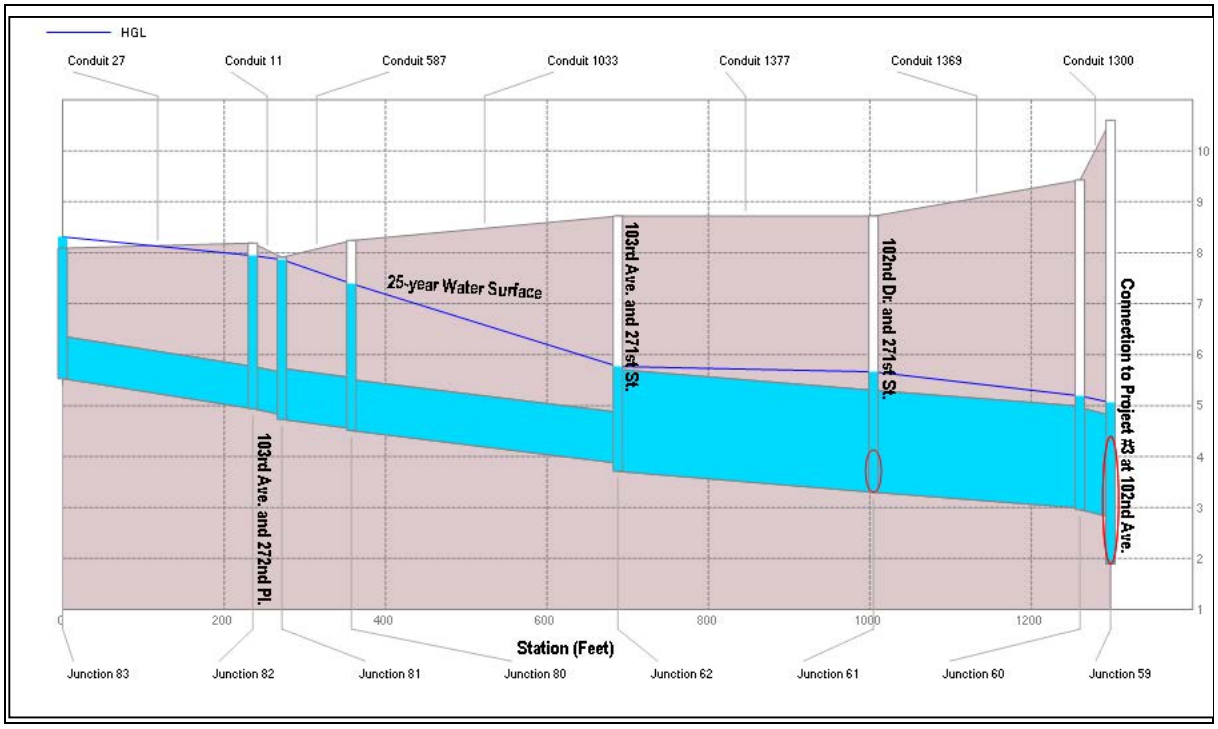
Figure 6-21: CIP Project #7 – Photos

Photo looking north on 101st Avenue NW from vicinity of 271st Street NW (April 25, 2014).

Photo looking south on 101st Avenue NW from 272nd Street NW (May 26, 2014).

Additionally, Project #3 will reduce flooding at 271st Street NW and 101st Avenue NW, and Project #6 will fully eliminate flooding along 100th and 101st Avenues NW. There is, however, simulated flooding at the north end of 103rd Avenue NW during the 25-year flood that is not mitigated by those projects. The existing hydraulic profile along this reach is shown in Figure 6-12, along with Project #3.

Figure 6-22: CIP Project #7 – Hydraulic Profile Along 103rd Avenue NW and 271st Street NW



Hydraulic profile along 103rd Avenue NW and 271st Street NW, showing sections of stormwater system that need to be upsized to provide 25-year conveyance capacity.

Project Description: Under this project, local drainage improvements and road resurfacing will be performed on 101st Avenue NW, 102nd Drive NW, and 103rd Drive NW. Modeling of these portions of the system shows that additional pipe replacement is also needed to provide capacity in the 103rd Drive NW conveyance system. Thus, pipe replacement would need to be performed along 103rd Drive NW between 273rd Street NW and 271st Street NW under all ISSSP designs. In addition to replacing the pipe on 103rd Drive NW, the existing pipe along 271st Street NW also needs to be replaced to prevent street flooding in the higher 4-foot water level ISSSP design scenario. (Note: The 271st Street NW pipe replacements are not needed if the ISSSP design keeps water levels below the pipe invert at the system outfall. Pipe replacements along 271st Street NW are included in the cost estimate as optional. The 103rd Drive NW and 271st Street NW pipe segments are highlighted in orange in Figure 6-23.)

The existing pipes on 101st Avenue NW and 102nd Drive NW provide adequate capacity, but new pipes are included in the project because they will likely need to be replaced to facilitate connections to yard drains on private properties and the grading changes associated with other street improvements.

Project Benefits: The street improvements will provide local drainage to 101st Avenue NW, 102nd Drive NW, and 103rd Drive NW. This project will compliment increases in conveyance capacity associated with Projects #3 and #6 by providing the same performance standard to all of the streets north of 271st Street NW.

Design Assumptions:

- 25-year design standard.
- The ISSSP, Project #3, and Project #6 will be constructed.
- It is assumed that curb, gutter, and sidewalk will need to be removed and replaced on 271st Street NW.
- 3 feet of pipe cover will be provided.
- Right-of-way purchase and environmental studies are not included.

Project Illustration Map: See Figure 6-23.

Estimated Quantities and Costs: See Tables 6-10A, 6-10B, 6-10C, and 6-10D.

Figure 6-23: CIP Project #7 – Illustration Map

Table 6-10: CIP Project #7 Costs

Item	Description	Estimated Quantity	Unit	Unit Cost	Total
101st Avenue NW					
1	SPCC Plan	1	LS	$1,000.00	$1,000.00
2	Temporary Traffic Control	1	LS	$5,000.00	$5,000.00
3	Mobilization	1	LS	$45,000.00	$45,000.00
4	Grind Existing Pavement	3,767	SY	$10.00	$37,666.67
5	Removal and Disposal of Existing Storm Sewer Pipe	1,078	LF	$15.00	$16,170.00
6	Crushed Surfacing Top Course	948	TON	$30.00	$28,443.38
7	HMA Cl 1/2" PG 64-22 – 3" Depth	643	TON	$175.00	$112,607.64
8	Concrete Curb Ramps	6	EA	$1,500.00	$9,000.00
9	Concrete Sidewalk	1,256	SY	$40.00	$50,222.22
10	Storm Sewer Pipe, 12" Diameter	700	LF	$60.00	$42,000.00
11	Storm Sewer Pipe, 24" Diameter	378	LF	$90.00	$34,020.00
12	Yard Drain Stubs	26	EA	$200.00	$5,200.00
13	Type II Catch Basin, 48" Diameter	14	EA	$4,500.00	$63,000.00
14	Connection to Existing Drainage Structure/Pipe	5	EA	$500.00	$2,500.00
15	Bank Run Gravel for Pipe Zone Backfill	291	Ton	$30.00	$8,729.53
16	Erosion Control and Water Pollution Control	1	LS	$5,000.00	$5,000.00
17	Concrete Curb and Gutter	2260	LF	$25.00	$56,500.00
		Subtotal			**$522,059.44**
102nd Drive NW					
1	SPCC Plan	1	LS	$1,000.00	$1,000.00
2	Temporary Traffic Control	1	LS	$5,000.00	$5,000.00
3	Mobilization	1	LS	$30,000.00	$30,000.00
4	Grind Existing Pavement	2,667	SY	$10.00	$26,666.67
5	Removal and Disposal of Existing Storm Sewer Pipe	800	LF	$15.00	$12,000.00
6	Crushed Surfacing Top Course	618	TON	$30.00	$18,544.00
7	HMA Cl 1/2" PG 64-22 – 3" Depth	456	TON	$175.00	$79,722.22
8	Concrete Curb Ramps	4	EA	$1,500.00	$6,000.00
9	Concrete Sidewalk	889	SY	$40.00	$35,555.56
10	Storm Sewer Pipe, 12" Diameter	800	LF	$60.00	$48,000.00
11	Yard Drain Stubs	19	EA	$200.00	$3,800.00
12	Type II Catch Basin, 48" Diameter	13	EA	$4,500.00	$58,500.00
13	Connection to Existing Drainage Structure/Pipe	6	EA	$500.00	$3,000.00
14	Bank Run Gravel for Pipe Zone Backfill	175	Ton	$30.00	$5,252.44

Table 6-10: CIP Project #7 Costs

Item	Description	Estimated Quantity	Unit	Unit Cost	Total
15	Erosion Control and Water Pollution Control	1	LS	$5,000.00	$5,000.00
16	Concrete Curb and Gutter	1600	LF	$25.00	$40,000.00
		Subtotal			**$378,040.89**
103rd Drive NW					
1	SPCC Plan	1	LS	$1,000.00	$1,000.00
2	Temporary Traffic Control	1	LS	$5,000.0.	$5,000.00
3	Mobilization	1	LS	$35,000.00	$35,000.00
4	Grind Existing Pavement	2,667	SY	$10.00	$26,670.00
5	Removal and Disposal of Existing Storm Sewer Pipe	678	LF	$15.00	$10,170.00
6	Crushed Surfacing Top Course	590	TON	$30.00	$17,712.90
7	HMA Cl 1/2" PG 64-22 – 3" Depth	456	TON	$175.00	$79,722.22
8	Concrete Curb Ramps	5	EA	$1,500.00	$7,500.00
9	Concrete Sidewalk	889	SY	$40.00	$35,555.56
10	Storm Sewer Pipe, 12" Diameter	236	LF	$60.00	$14,160.00
12	Storm Sewer Pipe, 18" Diameter	442	LF	$80.00	$35,360.00
13	Yard Drain Stubs	23	EA	$200.00	$4,600.00
14	Type II Catch Basin, 48" Diameter	14	EA	$4,500.00	$63,000.00
15	Connection to Existing Drainage Structure/Pipe	8	EA	$500.00	$4,000.00
16	Bank Run Gravel for Pipe Zone Backfill	180	Ton	$30.00	$5,393.89
17	Erosion Control and Water Pollution Control	1	LS	$5,000.00	$5,000.00
18	Concrete Curb and Gutter	1600	LF	$25.00	$40,000.00
		Subtotal			**$389,844.56**
271st Street NW – (Optional Project)					
1	SPCC Plan	1	LS	$1,000.00	$1,000.00
2	Temporary Traffic Control	1	LS	$15,000.00	$15,000.00
3	Mobilization	1	LS	$15,000.00	$15,000.00
4	Remove and Dispose of Existing Pavement	500	SY	$1,250.00	$625,000.00
5	Removal and Disposal of Existing Storm Sewer Pipe	600	LF	$15.00	$9,000.00
6	Removal and Disposal of Existing Curb and Gutter	255	LF	$5.00	$1,275.00
8	Crushed Surfacing Top Course	724	TON	$30.00	$21,723.33
9	HMA Cl 1/2" PG 64-22 – 3" Depth	80	TON	$175.00	$13,951.39
10	Storm Sewer Pipe, 30" Diameter	600	LF	$125.00	$75,000.00
11	Type II Catch Basin, 48" Diameter	6	EA	$4,500.00	$27,000.00
12	Connection to Existing Drainage Structure/Pipe	2	EA	$500.00	$1,000.00

Table 6-10: CIP Project #7 Costs

Item	Description	Estimated Quantity	Unit	Unit Cost	Total
13	Bank Run Gravel for Pipe Zone Backfill	266	Ton	$30.00	$7,980.00
14	Erosion Control and Water Pollution Control	1	LS	$5,000.00	$5,000.00
15	Concrete Curb and Gutter	255	LF	$25.00	$6,375.00
		Subtotal			**$824,304.72**

Subtotal (All 3 Projects excluding Optional Project)	**$1,289,944.89**
Contingency (30%)	$386,983.47
TOTAL CONTRACT COST	$1,676,928.36
Engineering/Permitting/CM	$435,000.00
Total Project Cost	**$2,111,928.36**

Subtotal (All 3 Projects including Optional Project)	**$2,114,249.61**
Contingency (30%)	$634,274.88
TOTAL CONTRACT COST	$2,748,524.50
Engineering/Permitting/CM	$500,000.00
Total Project Cost	**$3,248,524.50**

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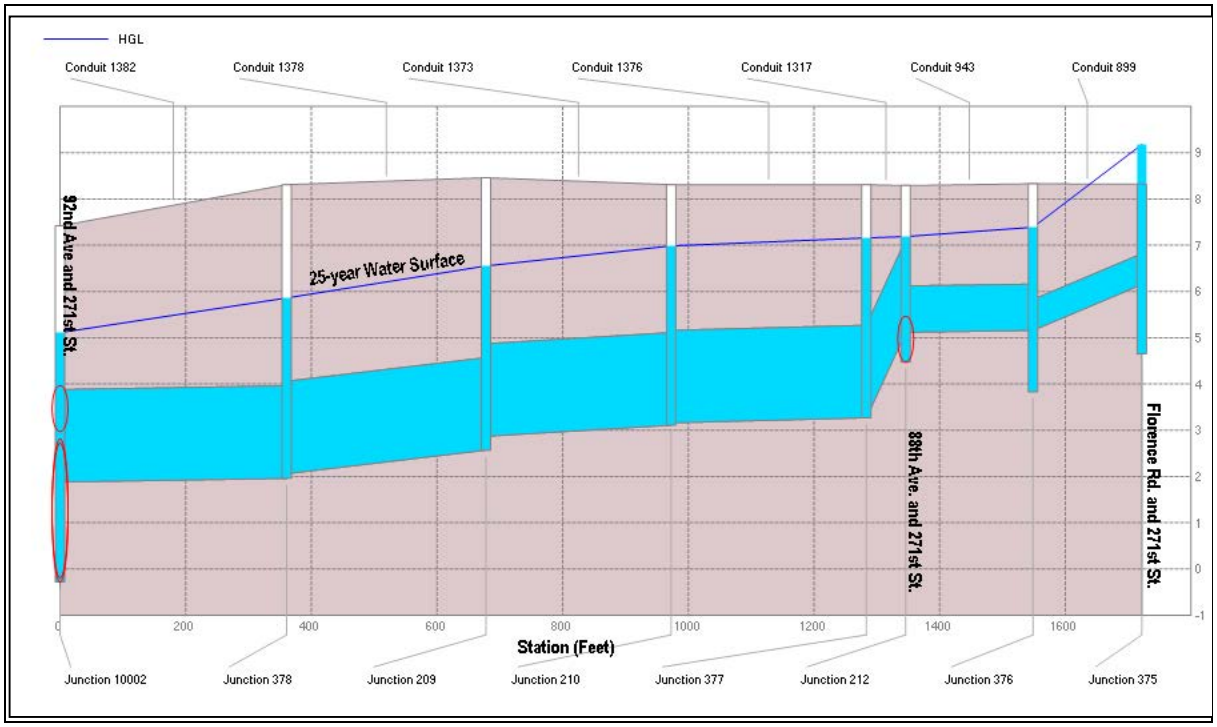
6.20 CIP PROJECT #8
271ST STREET NW AT FLORENCE DRIVE PIPE UPSIZE

Drainage Problem ID(s): 34

Problem Description: Drainage complaints have identified flooding problems on the west side of the BNSF railroad tracks on 271st Street NW at Florence Drive. This problem was confirmed with the stormwater model to be a problem, even after the ISSSP is constructed. A profile of the existing stormwater system is shown in Figure 6-24. The water level rising above the ground surface at Florence Drive can be seen at the right edge of the figure. The east end of 271st Street NW at Florence Drive, where the project is located, is also shown in Figure 6-19.

Figure 6-24: CIP Project #8 – Hydraulic Profile Along 271st Avenue NW – Existing System



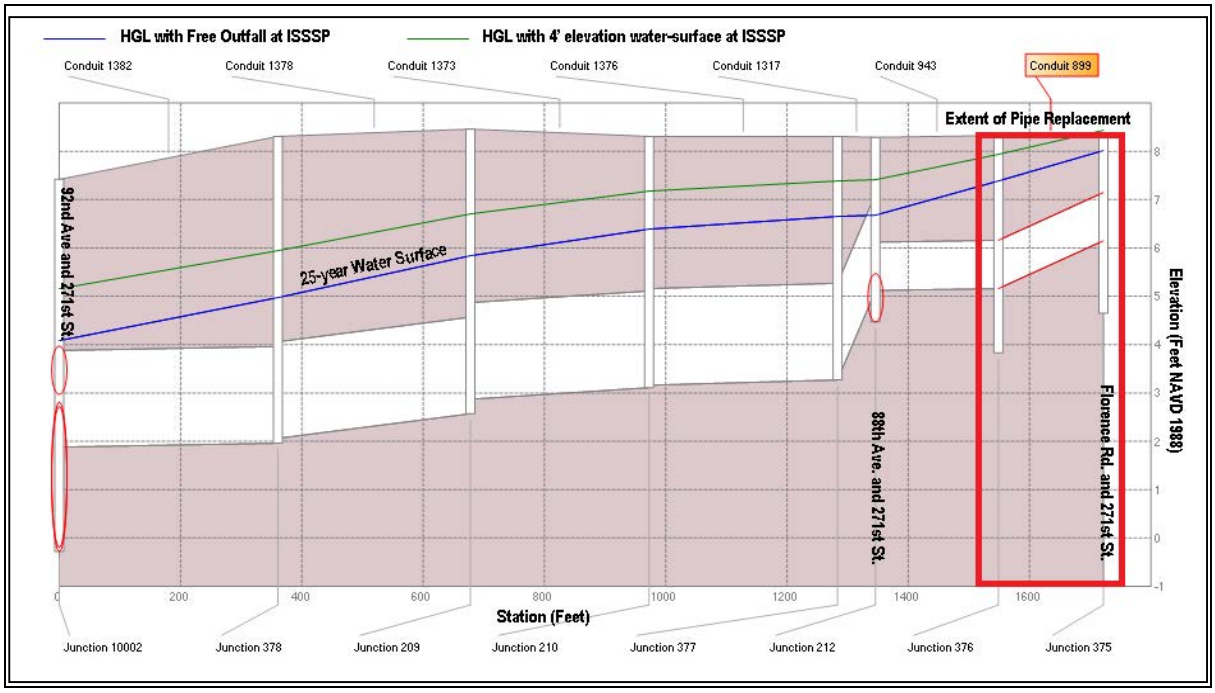
Hydraulic profile along 271st Street NW between Florence Drive and 92nd Avenue NW, showing the existing stormwater system.

Figure 6-25: CIP Project #8 – 271st Street NW (Main Street)

271st Street NW (Main Street), looking west from Florence Drive (Photo Courtesy of Joe Mabel).

Project Description: This CIP project will replace a single 8-inch-diameter pipe (conduit #899) on 271st Street NW, just west of Florence Drive, with a 12-inch-diameter pipe. The extent of the project is identified by the orange line in Figure 6-19 and the red box shown in Figure 6-26. The blue line shown in Figure 6-26 represents the water level in the system if the ISSSP keeps water levels below the invert of the outfall at 92nd Avenue NW. The green line shows the water level if the ISSSP only keeps water levels below an elevation of 4 feet at the system outfall. (Note: There is a very small amount of street ponding at Florence Drive in the case with the higher ISSSP water level.)

Figure 6-26: CIP Project #8 – Hydraulic Profile Along 271st Street NW – Simulated Flooding



Hydraulic Profile Along 271st Street NW showing simulated flooding at Florence Drive in the 25-year flood.

Project Benefits: When completed, this project will reduce the frequency of flooding at the intersection of 271st Street NW and Florence Drive. Simulated flooding is eliminated in the 25-year storm if the ISSSP lowers water levels below the outfall pipe invert (a free outfall condition*). Only a few inches of flooding is simulated in the case when the ISSSP controls water levels at the outfall to an elevation below 4'. (Note: A free outfall condition means that the stormwater runoff can flow directly to the river via gravity flow without any blockages or detention due to undersized facilities, reverse or inadequate grades, or lack of pumping capacity at the pump station.)

Design Assumptions:

- 25-year design standard.
- The ISSSP and Project #2 will be constructed.
- It is assumed that curb, gutter, and sidewalk will need to be removed and replaced on 271st Street NW.
- 3 feet of pipe cover will be provided.
- Right-of-way purchase and environmental studies are not included.

Project Illustration Map: See Figure 6-19, presented with Project #5.

Estimated Quantities and Costs: See Table 6-11.

Table 6-11: CIP Project #8 Costs

Item	Description	Estimated Quantity	Unit	Unit Cost	Total
1	SPCC Plan	1	LS	$1,000.00	$1,000.00
2	Temporary Traffic Control	1	LS	$20,000.00	$20,000.00
3	Mobilization	1	LS	$9,000.00	$9,000.00
4	Remove and Dispose of Existing Pavement	104	SY	$12.50	$1,298.61
5	Removal and Disposal of Existing Storm Sewer Pipe	170	LF	$15.00	$2,550.00
6	Removal and Disposal of Existing Curb and Gutter*	170	LF	$5.00	$850.00
7	Removal and Disposal of Existing Sidewalk*	94	SY	$12.50	$1,180.56
8	Crushed Surfacing Top Course**	131	TON	$30.00	$3,940.60
9	HMA Cl 1/2" PG-64–22 — 4" Depth	23	TON	$175.00	$4,099.72
10	Concrete Sidewalk*	94	SY	$40.00	$3,777.78
11	Storm Sewer Pipe, 12" Diameter	170	LF	$60.00	$10,200.00
12	Type II Catch Basin-48" Diameter	5	EA	$4,500.00	$22,500.00
13	Connection to Existing Drainage Structure/Pipe	1	EA	$500.00	$500.00
14	Bank Run Gravel for Pipe Zone Backfill	37	Ton	$30.00	$1,116.14
15	Erosion Control and Water Pollution Control	1	LS	$5,000.00	$5,000.00
16	Concrete Curb and Gutter*	170	LS	$25.00	$4,250.00

Subtotal	$91,263.40
Contingency (30%)	$27,379.02
TOTAL CONTRACT COST	$118,642.43
Engineering/Permitting/Construction Management	$40,000.00
Total Project Cost	**$158,642.43**

6.21 CIP PROJECT #9
7 TINY TUBES; OLD STILLAGUAMISH FLOOD RELEASE CULVERT SLIP LINE

Drainage Problem ID(s): 17

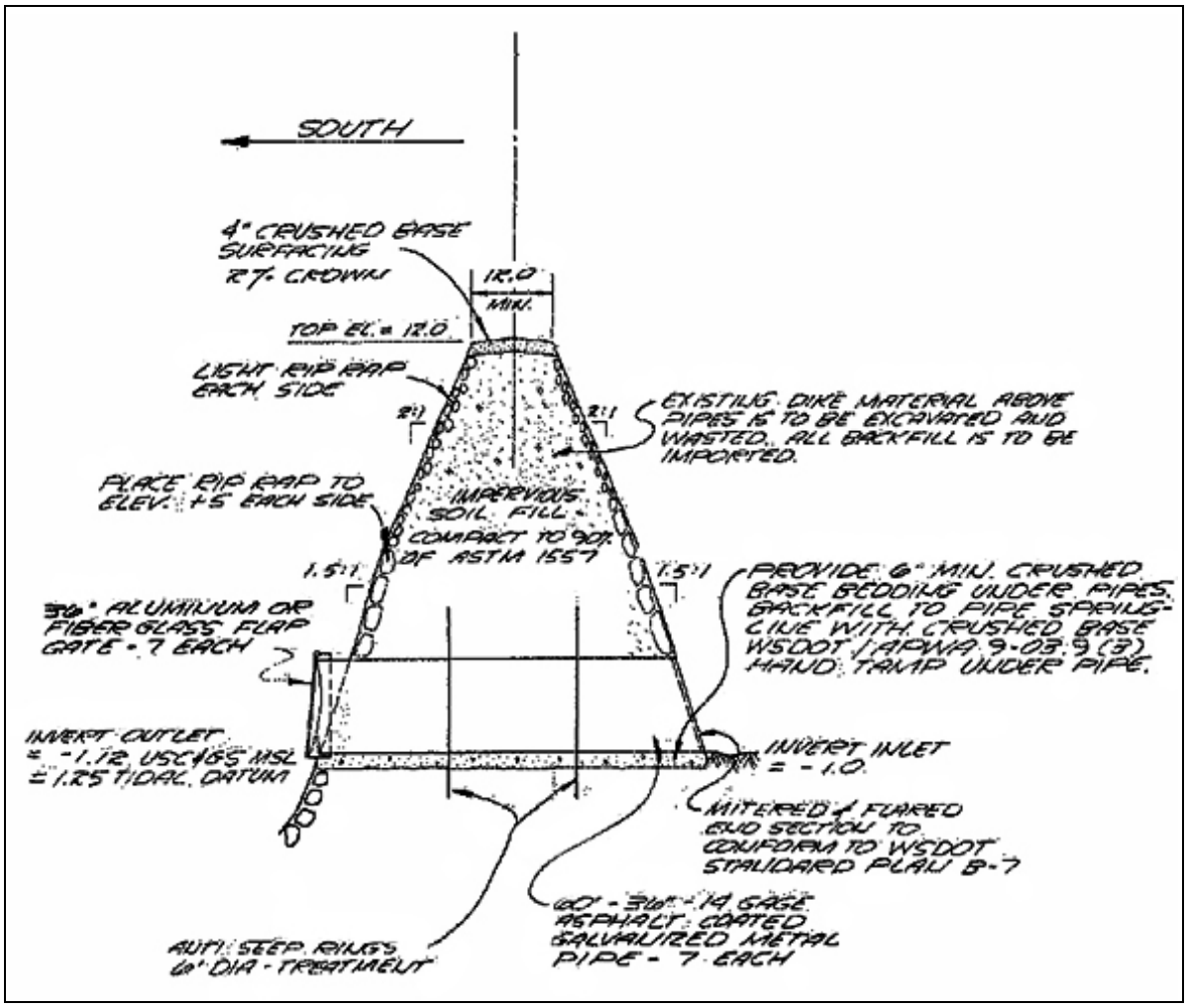
Problem Description: These seven "tiny" pipes, each 36 inches in diameter, are intended to allow the floodplain on the north side of the Stillaguamish River levee to drain back into the river after large floods. The pipes, commonly called the "7 tiny tubes", need to be replaced due to leakage and concerns regarding their integrity. Additionally, one of the pipes is missing a flood gate and all of the gates are degraded. Leakage through the pipes allows Stillaguamish River water to flow into Irvine Slough and that water must be pumped via the Irvine Slough Pump Station back into the Stillaguamish River. Photos of the existing pipes are shown in Figure 6-27 and the original design drawing is shown in Figure 6-28.

Figure 6-27: 7 Tiny Tubes – Photos

Outlet of 7 Tiny Tubes, Photo taken October 23, 2007 (Photo courtesy City staff).

Inlet of 7 Tiny Tubes, Photo taken January 8, 2013 (NHC).

Figure 6-28: CIP Project #9 – 7 Tiny Tubes Design Drawing, July 1990



Project Description: The seven pipes will be slip-lined with a smaller diameter pipe than the existing 36-inch diameter installed in the original design. Only one gate is missing, but all seven are included in the cost estimate because the other six are not functioning well.

Project Benefits: The CIP improvements will prevent leakage of Stillaguamish River water into the Irvine Slough system during high tide conditions, resulting in lower pumping costs at the Irvine Slough Pump Station. Repairing the pipes will also reduce the risk that they may collapse and lose their functionality at lowering water levels in the floodplain.

Design Assumptions:

- Right-of-way purchase and environmental studies are not included.

Project Illustration Map: See Figure 6-29.

Estimated Quantities and Costs: See Table 6-12.

Figure 6-29: CIP Project #9 – Illustration Map

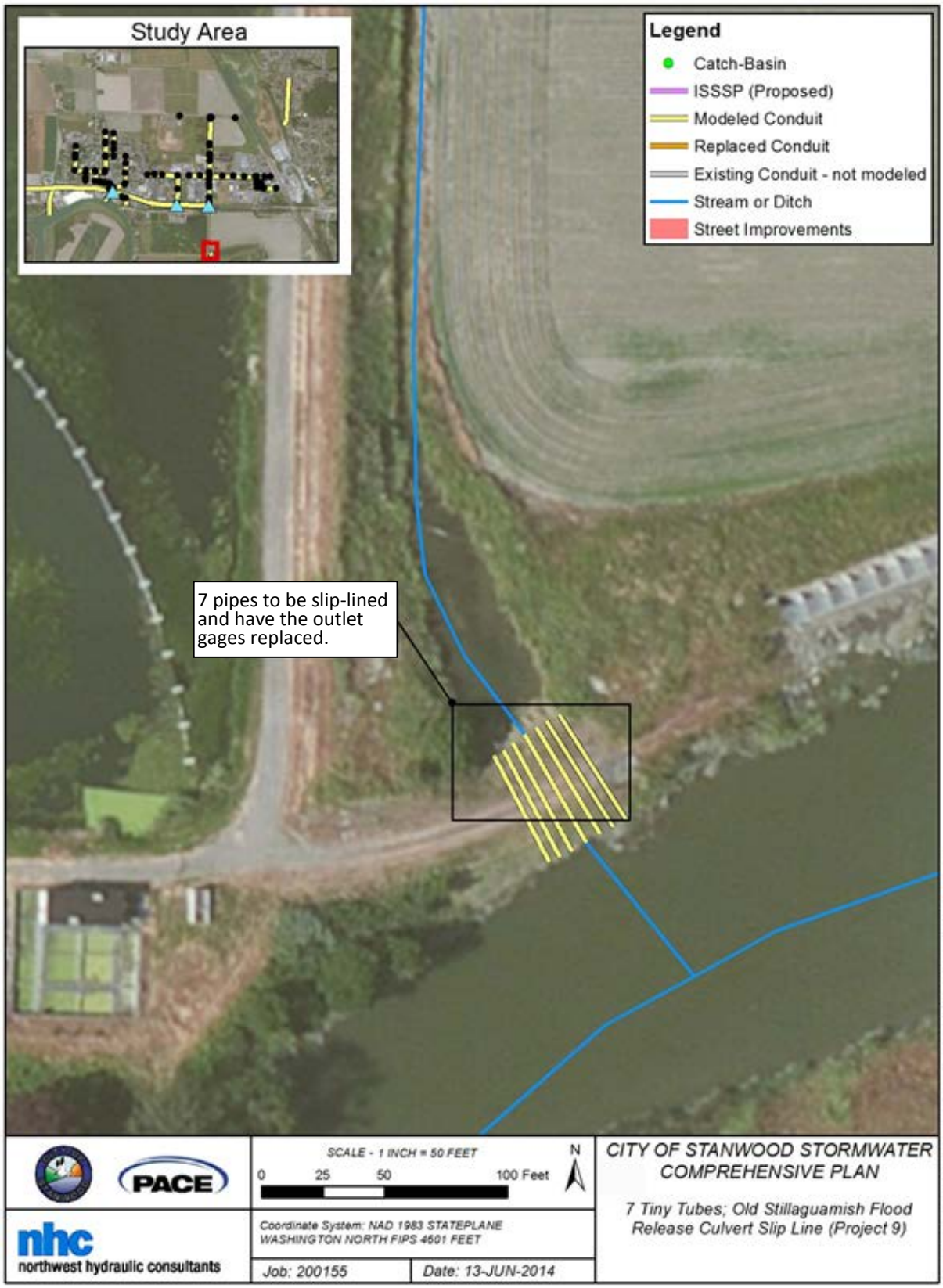


Table 6-12: CIP Project #9 Costs

Item	Description	Estimated Quantity	Unit	Unit Cost	Total
1	SPCC Plan	1	LS	$5,000.00	$5,000.00
2	Mobilization	1	LS	$8,000.00	$8,000.00
3	Slip Lining Existing 36" Pipe	420	LF	$140.00	$58,800.00
4	36" Diameter Flap Gate	7	EA	$2,000.00	$14,000.00
5	Erosion and Water Pollution Control	1	LS	$5,000.00	$5,000.00

Subtotal	$90,800.00
WSST @ 8.8%	$7,990.40
TOTAL CONTRACT COST	$98,790.40
Engineering/Permitting/Construction Management	$45,400.00
Total Project Cost	**$144,190.40**

6.22 CIP PROJECT #10
85TH DRIVE NW DRAINAGE IMPROVEMENTS

Drainage Problem ID(s): 54

Problem Description: There is no formal drainage system along 85th Drive NW and drainage from the City street routinely floods a private residence at the 27800 block. Three photos of the street are shown in Figure 6-30.

Figure 6-30 CIP Project #10 – 85th Drive NW Photos

Photo looking south along 85th Drive NW from 27800 block.

Photo looking south along 85th Drive NW from 27800 block.

Photo looking north along 85th Drive NW from 276th Place NW.

Project Description: This CIP solution will provide street drainage and resurfacing on 85th Drive NW between 280th Street NW and 276th Place NW. As part of the CIP, a piped conveyance system will be constructed along 85th Drive NW that will flow south, connecting to the proposed ditch at 276th Place NW to be constructed as part of Project #4.

Design Assumptions:

- It was assumed that a 12-inch-diameter pipe will be adequate to convey a 25-year return period runoff from this street, but the needed pipe size should be confirmed during final design.

Project Benefits: Improved drainage along 85th Drive NW and potential to intercept groundwater affecting properties to the west on 86th Drive NW.

Project Illustration Map: See Figure 6-16, presented with Project #4.

Estimated Quantities and Costs: See Table 6-13.

Table 6-13: CIP Project #10 Costs

Item	Description	Estimated Quantity	Unit	Unit Cost	Total
1	SPCC Plan	1	LS	$1,000.00	$1,000.00
2	Temporary Traffic Control	1	LS	$5,000.00	$5,000.00
3	Mobilization	1	LS	$40,000.00	$40,000.00
4	Grind Existing Pavement	4,000	SY	$10.00	$40,000.00
5	Removal and Disposal of Existing Storm Sewer Pipe	1,200	LF	$15.00	$18,000.00
6	Crushed Surfacing Top Course*	927	TON	$30.00	$27,816.00
7	HMA Cl 1/2" PG-64–22 — 3" Depth	569	TON	$175.00	$99,652.78
8	Concrete Curb Ramps	4	EA	$1,500.00	$6,000.00
9	Concrete Sidewalk	1,333	SY	$40.00	$53,333.33
10	Storm Sewer Pipe, 12" Diameter	1200	LF	$60.00	$72,000.00
13	Type I Catch Basin	13	EA	$2,500.00	$32,500.00
14	Connection to Existing Drainage Structure/Pipe	5	EA	$500.00	$2,500.00
15	Bank Run Gravel for Pipe Zone Backfill	263	Ton	$30.00	$7,878.67
16	Erosion Control and Water Pollution Control	1	LS	$2,500.00	$2,500.00
17	Concrete Curb and Gutter	2400	LF	$25.00	$60,000.00

Subtotal	$468,180.78
Contingency (30%)	$140,454.23
TOTAL CONTRACT COST	$608,635.01
Engineering/Permitting/Construction Management	$180,000.00
Total Project Cost	**$788,635.01**

References

Stanwood, 2010. City of Stanwood, Shoreline Master Program, Draft Shoreline Inventory and Analysis. Prepared by Parametrix. April 2010.

CHAPTER 7
FUTURE STORMWATER PROGRAM RECOMMENDATIONS

7.1 INTRODUCTION

With its location on Puget Sound, directly adjacent to the floodplain of the Stillaguamish River, the City of Stanwood is committed to establishing an efficient and effective flood control and Stormwater Management Program (SWMP). The City is also committed to providing for public safety and protecting properties and structures from the impacts of flooding and stormwater runoff. Effective stormwater management for this City is a key element in promoting the local and regional economy and sustaining the quality of life for its citizens. For the City of Stanwood, an efficient and effective SWMP involves:

- *Taking Care of Its Citizens and the Community:* Being responsive to the requests of its citizens for stormwater information and flood protection; sometimes this information and support come during a storm, and often during the middle of the night, in the form of sandbags and assistance to control and/or prevent localized flooding.
- *Building and Maintaining an Effective System of Capital Facilities:* This involves mapping and inventorying its collection of natural and manmade drainage facilities to ensure they are appropriately sized and always adequately repaired and maintained, in order to optimize performance and provide ongoing, continuous flow conveyance and flood protection. A properly sized, maintained, and functioning capital drainage system is the backbone of any effective SWMP. Such an effective SWMP is supported by an annually updated capital improvement program (CIP) that will ensure:
    - Repair/replacement of old, dysfunctional facilities.
    - Design and construction of needed capital facilities projects.
    - Upgrades to the system to keep it up to desired performance standards.
    - The ability to continue to meet the community's expectations for service.
- *Protecting, Preserving, and Restoring the City's Natural Environment:* The City's natural environmental and ecological systems are critical elements of the City's drainage, detention, water quality treatment, flood reduction, and aquifer recharge systems. Being located in a floodplain, where the freshwater of the Stillaguamish River meets the saltwater of Puget Sound, the City is surrounded by the rich, diverse, and productive ecological systems of the Stillaguamish estuary. The City is committed to creating an updated SWMP that protects and enhances water quality in wetlands, streams, floodplains, and adjoining natural drainage systems, in order to sustain and support the unique and productive nearby fish habitat and shellfish rearing areas.
- *Planning Ahead and Routinely Achieving Regulatory Compliance:* In addition, the City needs to plan ahead for existing and future regulatory requirements. The City is wise to begin to outline a path for enhancing its SWMP to be consistent with the requirements of a future

Permit, which could be issued to the City as soon as 2018. The regulatory gap analysis conducted as part of this SCP update provides a prioritized implementation plan with projected activities, staffing, and annualized costs to allow the City to come into compliance at its own pace, using procedures that are uniquely tailored to local conditions and community preferences and priorities.

- *Being a Good Intergovernmental and Regional Watershed Partner*: Working closely with the tribes, county, flood control/water quality and shellfish districts, land owners, businesses, and various regulatory agencies, citizen groups, and stakeholders, and coordinating with its neighbors on a local and regional basis is critical for the City's new SWMP. Developing and implementing a watershed-based perspective to preserve, protect, enhance, and restore the region's natural water resource systems and functions is important in order to sustain the benefits of the natural and manmade systems needed to support a consistent, uniform approach for the optimization of local resources. In order to achieve this, future land use and development need to be properly balanced with the protection and preservation of water quality, groundwater, habitat, and the myriad of naturally functioning systems that make up the City's watersheds, protect local water supplies, and sustain surrounding natural systems.
- *Creating a Visionary, Yet Effective and Implementable Updated Stormwater Comprehensive Plan (SCP)*: The purpose of developing this SCP is to create an updated mission for the City's SWMP. The recommended SWMP will be supported by a long-term funding and comprehensive action plan to ensure effective annualized implementation. Through this planning process, the City's existing SWMP was evaluated and compared to the needs of the community, the floodplain, and the watershed. Existing and future regulatory requirements, and future regional SWMP obligations were assessed and capital facility needs identified.

The product of the SWMP gap analysis, and the resulting SCP, will identify and quantify additional staff and resources needed to annually sustain an updated, viable, and effective SWMP. A viable annual SWMP has been assumed to proactively address the requirements of a future Permit, while maintaining effective capital and maintenance programs, as well as sustaining a healthy budget to routinely acquire necessary staff and equipment.

The results of the SWMP and Regulatory Compliance Gap Analysis, developed for the City of Stanwood, are presented in this final chapter of the SCP in the form of a recommended SWMP. The updated SWMP includes activities, prioritized capital projects, costs, and an implementation plan, with defined staffing levels, equipment, and annual revenue needs. The SCP is presented in the form of an annualized SWMP so it can be budgeted and implemented on an annual basis over the next ten years. This study gives the City "credit for its existing stormwater management activities," with future SWMP needs defined as the "gaps" in the existing SWMP. The City's existing SWMP, plus the activities and costs presented in the "gap", constitute the future needs of the City's annual SWMP.

Future Permit needs have been averaged over a hypothetical five-year planning period, and presented as one set of averaged, annualized costs for each of the twelve major stormwater management planning elements. Capital facility needs are normally achieved over a longer, 10-year to 20-year planning period in order to allow the needed resources to be realized for design and construction. This updated SCP presents an effective SWMP to assist in compliance with a future Permit and the design and construction of needed capital facilities.

City staff have also reviewed and adjusted the results of the gap analysis in order to ensure the updated SWMP is consistent with local priorities and financial capabilities. In this final chapter, the City's preferred level of SWMP resource allocation is documented and compared to both the City's existing SWMP and the SWMP from the Regulatory Gap (and CIP) Analysis, which also includes an updated CIP.

7.2 STRUCTURE OF CITY'S STORMWATER PROGRAM

To create the City's recommended annual SWMP, the various stormwater activities and services were divided into twelve stormwater management planning activities, or planning elements. Chapter 7 presents the City's SWMP as a series of recommended activities and services and includes an annual capital improvement program. Also presented are the results of the City's most recent SWMP-related policy decisions in regard to local priorities, resource allocation, and funding.

The SWMP described in this SCP is presented in the form of a spreadsheet that is organized according to each of the major elements, as summarized below. The complete detailed spreadsheet and supporting gap analysis are presented in Appendix B, NPDES Permit Gap Analysis.

The City's SWMP is organized into the following twelve major stormwater management elements, including:

- Element #1: Public Education and Outreach
- Element #2: Public Involvement and Participation
- Element #3: Illicit Discharge Detection and Elimination
- Element #4: Controlling Runoff from New Development, Redevelopment, and Construction Sites
- Element #5: Municipal Operations and Maintenance
- Element #6: Program Implementation
- Element #7: Total Maximum Daily Load: Stillaguamish River
- Element #8: Monitoring
- Element #9: Reporting
- Element #10: Underground Injection Control Rule
- Element #11: Stormwater Capital Improvement Program
- Element #12: Administrative and Additional Activities

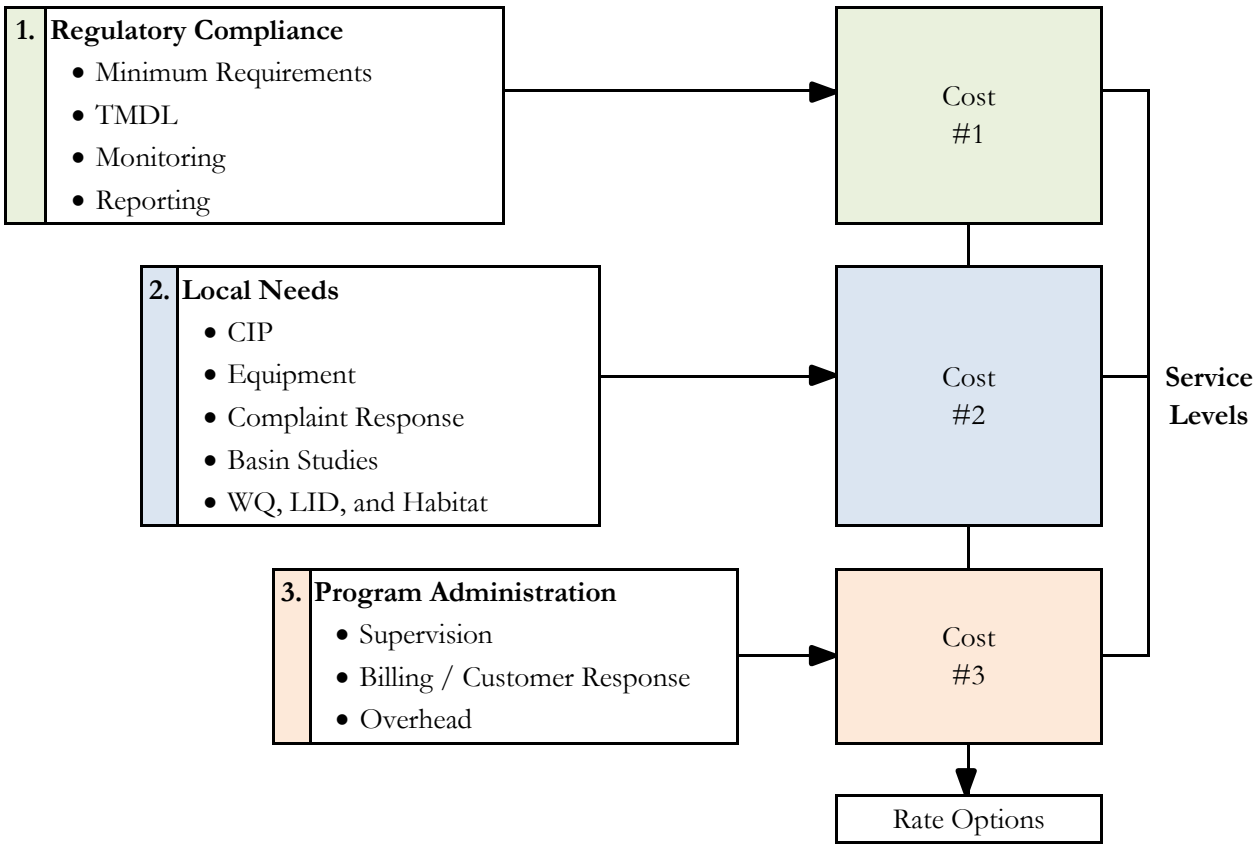
Conceptually, the City's SCP was developed according to the schematic diagram shown in Figure 7-1, and includes regulatory compliance, local needs (including capital needs), program administration, and funding.

In developing and evaluating the City's stormwater management services, the levels of needed staffing and funding were compared and contrasted with recommended capital projects and internal SWMP programmatic priorities. The results may be readily presented in the form of annualized levels of service and funding (and corresponding Drainage Utility rates) for review and approval by City staff, the public, and elected officials.

(Note: The public review process will conclude with the selection of one of the preferred levels of service and levels of funding, with associated Drainage Utility fees, as is currently being developed and presented by the City's financial consultant. Their financial analysis is being jointly prepared and released to the public along with this SCP.)

Figure 7-1: Schematic Diagram of the City's Stormwater Comprehensive Planning Process

Conceptual Process to Identify Service Levels and Create Utility Rate Options



Similar to the schematic diagram above, the City's existing annual SWMP has been created to address each of the following:

- *Regulatory Compliance:* including Elements #1-10, with the stormwater management activities related to the requirements of a future NPDES Phase II Municipal Stormwater Permit presented in Elements #1-9.
- *Local Needs:* including capital improvement projects and other local needs, such as equipment, water quality, and complaint response, as included in Element #11.
- *Program Administration:* including those additional administrative activities and costs, such as billings, accounting, financial support, and overhead, as summarized in Element #12.

Although the City is not currently under the requirements of a Permit, this chapter documents what stormwater management activities the City is currently performing on an annualized basis and what activities may be required by a future Permit. (Note: Establishing and maintaining an effective and annually funded CIP is not a Permit requirement, but is required by other regulatory means such as the Growth Management Act.)

Thus, as shown previously, the requirements of a future NPDES Permit are represented in the first nine of the twelve Stormwater Program Elements. Elements ten through twelve address the City's additional stormwater obligations, which include the Underground Injection Control (UIC) Rule, the City's Capital Improvement Program, and additional storm drainage activities, including SWMP administration and utility accounting, billing/financial services, and internal overhead.

7.3 IMPLEMENTATION PLANNING: ESTABLISHING PRIORITIES, ACTIVITIES, AND COSTS

The rate at which the City phases in its various SWMP elements to achieve compliance with a future Permit and fix local flooding problems, including the CIP, will determine the amount of staff and revenue needed each year. A few thoughts for establishing SWMP priorities are presented below.

7.3.1 Maintenance

Maintenance is one of those activities from which the City can obtain immediate returns for relatively little investment. Hiring one more full-time maintenance person and providing additional annual supplies and support services will bring immediate returns and allow the City to fix numerous historical localized flooding problems.

From an engineering perspective, maintenance allows the City to realize additional capacity, as if new CIP projects were being designed and constructed. When the system is properly maintained, the full original design capacity of the City's existing stormwater facilities can then be realized. Also, the citizens would see an immediate return on their investment, if the monthly Drainage Utility fees were to be raised at about the same time.

The suggested increase in annual funding (of $221,927) does not have to be realized all at once to see immediate improvements in local drainage performance. An enhanced O&M

program could be phased in over a two- to three-year period, at about an additional $75K to $100K per year. Even with reduced annual funding, the results of an enhanced O&M program will still be very quick in terms of fixing and reducing a number of the City's existing local flooding problems.

7.3.2 Capital Projects

Capital projects are aimed at fixing historical design and capacity problems in the City's existing drainage system. They are often relatively expensive and take time to design, fund, permit, and construct, but in many cases, they are also the only possible solution. This is particularly true for those parts of the City where there is little to no existing drainage system, and a drainage system needs to be installed after the fact in order to reduce and/or eliminate localized flooding problems.

A series of responsive CIP projects has been included in the development of the City's new SWMP. The complete success of the proposed CIP projects is in part dependent on the design and construction of a new major conveyance improvement system that will remove high water from the older downtown area during a major rain/flood event and allow the flatter portions of the City to effectively drain by gravity. This is the intent of the Irvine Slough Stormwater Separation Project (ISSSP), which was started in 2014. Without this project, there will continue to be significant backwater effects within the City's drainage system, causing localized flooding and standing water in many parts of the City.

The drainage CIP projects need to be prioritized by the public and City Council in order to allocate the annual CIP revenues. For the purposes of this "gap analysis" we have assumed an annual drainage CIP of $900,200 per year. This is an annual increase of $177,994 above the current level of $722,206. The development of the City's new drainage CIP will likely cause one of the largest increases in annual Drainage Utility fees, assuming the City uses the annual revenues from the Utility to fund capital improvement projects on a "pay-as-you-go" basis. Due to the severe nature of the City's flooding problems, both urban flooding and river flooding, accelerating the construction of major CIP projects would be very beneficial. The City is concurrently conducting a financial review of its funding options, including potentially adjusting its annual Drainage Utility fees.

7.3.3 Permit Compliance

When it comes to the various permit requirements, there are many stormwater management activities that could be phased in over time to create positive drainage effects throughout the City. (Note: The earliest the City might expect a Permit from Ecology is 2018, and this could even be delayed to 2023 or beyond, when the City realizes a population of over 10,000.) Activities that might have the most significant positive impacts on enhancing the City's existing SWMP include:

- Increasing the annual maintenance staffing and annual allocations of supporting supplies and services, as discussed above.

- Adopting the Washington State Department of Ecology's 2012 Stormwater Management Manual for Western Washington (SWMMWW). This would help address the drainage needs of new development and redevelopment, as well as preserve the integrity and capacity of the City's existing drainage system and proposed CIP.
- Enhancing the City's permitting, development review, and inspection program by establishing or raising developer fees for development-related services provided by the City.
- Establishing a new Illicit Discharge Detection and Elimination (IDDE) Program would take time and special training; however, if done correctly, it is also one of the best ways to begin to improve water quality throughout the City.

7.4 ANNUAL SWMP, CIP, AND REGULATORY COMPLIANCE PROGRAM

This section presents a discussion of the results of the Regulatory Compliance (and CIP) Gap Analysis, according to each of the SWMP Elements. It summarizes major stormwater activities and identifies the net change or financial "gap" that needs to be met by the City on an annual basis in order to achieve and maintain compliance with a future Permit, and support an updated CIP. A summary of the regulatory gap analysis, including CIP, is presented in Section 7.4.2. It is followed in Section 7.4.3 by a revised gap analysis as preferred by City staff. These gap analysis summaries are followed by a brief explanation in Section 7.5 of each of the enhanced elements of the City's update SWMP.

7.4.1 Introduction and Overview

The following analysis of the City's SWMP has been presented in three parts:

- The first part is referred to in the text as the Regulatory (and CIP) Gap Analysis, with a summary of the results presented in Table 7-1 and discussed in Section 7.4.2.
- The second part is referred to in the text as the City Staff Preferred/Gap Analysis, with a summary of results presented in Table 7-2 and discussed in Section 7.4.3.
- The third part is a comparison of the two analyses and identification of the City's future SWMP needs, based on the priorities set by City staff in Section 7.4.3, and is presented according to each of the 12 SWMP Elements in Section 7.5.

7.4.2 Summary of SWMP Regulatory Gap (and CIP) Analysis

The City's stormwater management needs are addressed in the Regulatory Gap (and CIP) Analysis and a recommended SWMP is presented in the form of an annualized SWMP, as summarized in Table 7-1. The existing SWMP Regulatory Gap (and CIP) Analysis, based on the City's 2014 budget, is presented in Appendix B, and the City's 2014 Budget is presented in Appendix A.15.

The results of the gap analysis show that the City needs an additional 3.41 staff and expense funding, costing an additional $644,525 annually, with a total annual SWMP cost of $1,892,805 which includes an annual CIP of $900,200. This is an annual increase of $644,525 above the existing SWMP of $1,248,280. Highlights of the recommended annual SWMP, according to the Regulatory (and CIP) Gap Analysis, include the following:

Annual Costs:

- An increase in annual operating costs from $1,248,280 to $ 1,892,805 ($1,248,280 + $644,525)
- An increase in annual costs by $644,525, which includes $369,241 for staffing and $275,284 for expenses
- And an annual increase in CIP costs by $177,994, from $722,206 to $900,200, where the additional CIP dollars have been included in the increased funding for CIP expenses.

Staffing Level:

- An increase in permanent staffing from 2.09 full-time equivalents (FTE) to 5.50 FTE. This is an increase in annual staffing of 3.41 FTE, with 1.0 FTE for a full-time SWM manager who will primarily help with the Permit, 1.48 FTE for maintenance, 0.61 FTE for CIP supervision, and the remaining 0.32 FTE for GIS support, financial support, administration, and implementation of the Permit.

7.4.3 City's Preferred Level of Resource Allocation

Because the City is not currently under a Permit, the level and type of annual SWMP and CIP activities, including adoption of the 2012 Ecology Stormwater Manual, amended in 2014, are internal policy decisions to be made by City staff, the City Council, and the public, as the City's SWMP is developed over time. At this time, the City has elected to implement the results of the regulatory and programmatic "gap analysis" in steps and phases. Based on local priorities and considerations, City staff are suggesting the preferred SWMP reduce future internal staffing by 1.93 FTE to a total of 3.57 FTE, with 0.61 FTE for CIP Supervision being outsourced. The net result is an SWMP that increases by $507,205 annually, rather than by $644,526, as suggested in the Regulatory Gap Analysis. This is a difference of $137,321 in annual SWMP funding (to $1,755,485), and a difference of 1.32 FTE in new annual SWMP staffing (to total SWMP staffing of 3.57 FTE). (All future SWMM expenses from the Regulatory Gap Analysis totaling $275,284 have been retained, plus $62,994 has been included for new CIP staffing support, for a total increase in expenses of $338,278.)

At the present time, the City does not think it needs all of the recommended SWMP staffing and will phase in the new SWMP, and its staffing and annual funding increases, in small steps over an extended period of time. Highlights of the annual SWMP preferred by City staff include the following:

- The new SWM Manager position will not be needed in the near future; this saves the future SWMP $110,000 annually (including benefits). All SWMP Manager responsibilities will be absorbed by existing Public Works staff. (Note: This position has been omitted from the City's future annual SWMP.)
- The 1.48 additional FTE for annual maintenance (O&M) have been retained by City staff, bringing the total O&M staffing to 3.05 FTE (existing O&M staffing of 1.57 FTE increases by 1.48 FTE). These new staff will be hired and added internally when needed, as the City's annual maintenance needs increase over time. This will cost the City $168,927 annually for additional Public Works staff, plus expenses of $53,000, for a total increase in annual O&M costs of $221,927. (Note: These staffing and expense costs have been added to the City's future annual SWMP, making the total SWMP staffing level equal to 3.57 FTE. No other additional staff have been added to the new SWMP preferred by City staff, other than these 1.48 FTE added to the annual maintenance crew.)
- All GIS/mapping-related work will continue to be done internally by existing staff; separate GIS staffing and outside source costs have not been included in the future SWMP recommended by either the Regulatory (and CIP) Gap Analysis or the City Staff Preferred Gap Analysis.
- Additional engineering support to assist with the enhanced annual CIP (an increase of 0.61 FTE costing $62,993) will be outsourced and is not included in the new annual SWMP staff count; these future CIP staffing costs, however, are included in the new SWMP CIP expense costs.
- Expenses of $177,993 annually for new CIP projects will be included in the future SWMP. (Note: The CIP staffing cost of $62,993 moves into CIP-related expenses, increasing the CIP costs from $115,000 to $177,994 annually. This increases the annual CIP from $722,206 to $900,200.)
- Any future needs for increased administrative and overhead staff will be absorbed internally by existing City staff; there is, therefore, no increase in annual SWMP administrative costs, other than for increased expenses. These future administrative expenses are for the cost of Ecology's regional monitoring program that is associated with a future Permit, plus a modest increase in existing overhead costs.

In summary, the City's preferred SWMP does not retain a SWM Manager. It continues to do GIS in-house, outsources CIP staffing with other CIP activities, and internally hires only future maintenance staff, retaining supporting annual O&M expense funds and the expense funds for the other SWMP elements, as summarized below:

Annual Costs:

- The annual increase in SWMP costs has been reduced from $644,526 to $507,205 by City staff, a reduction of $137,320. The annual SWMP increase of $507,205

includes an increase of $221,922 for annual maintenance, $177,993 in annual CIP *(as calculated from $115,000 for increased CIP expenses, plus $62,993 for 0.61 FTE in supporting CIP staffing that will be contracted out)*, plus an additional $107,285 for future Permit monitoring costs and small increases in other SWMP administrative costs.

- This reduces the future SWMP operating costs from $1,892,805 to $1,755,485, as calculated by adding the cost of the existing SWMP (of $1,248,280) to the annual SWMP increase (of $507,205).

Staffing Level:

- The City's annual staffing needs can be reduced from an additional 3.41 FTE to only 1.48 new FTE in the future for maintenance support. This is an annual reduction of 1.93 FTE, with 0.61 in CIP FTE shifting to CIP expenses. Total SWMP staffing is thus reduced to 3.57 FTE (2.09 existing, plus 1.48 for new maintenance staff).
- The $62,994 for 0.61 FTE in CIP support staff is moved from internal staffing into future CIP expense costs due to being outsourced. (Note: These CIP staffing dollars have been included with the CIP expense amount of $115,000, bringing the increase in CIP expenses to $177,994.)

Table 7-1: Detailed SWMP and Gap Analysis Results

Storm Drainage Program Elements	Existing (2014) Staff FTE(2)	Existing (2014) Staff Cost ($)	Existing (2014) Expense Cost ($)	Existing Total Costs ($)	Future Staff FTE (2)	Future Staff Cost ($)	Future Expense Cost ($)	Future Total Costs ($)	Total Net Change
Element #1: Public Education and Outreach (1)	0.00	$0	$0	$0	0.08	$8,021	$3,000	$11,021	$11,021
Element #2: Public Involvement and Participation (1)	0.02	$1,744	$0	$1,744	0.05	$50,13	$2,500	$7,513	$5,770
Element #3: Illicit Discharge Detection and Elimination (1)	0.02	$1,744	$0	$1,744	0.41	$41,109	$11,500	$52,609	$50,865
Element #4: Controlling Runoff from New Development, Redevelopment and Construction Sites (1), (3)	0.07	$6,103	$0	$6,103	0.57	$57,152	$5,750	$62,902	$56,799
Element #5: Municipal Operation and Maintenance (1)	1.57	$136,885	$42,500	$179,385	3.05	$305,812	$95,500	$401,312	$221,927
Element #6: Program Implementation (1)	0.00	$0	$0	$0	0.07	$7,019	$1,000	$8,019	$8,019
Element #7: Total Maximum Daily Load Allocations: Stillaguamish River (1)	0.00	$0	$0	$0	0.07	$7,019	$15,000	$22,019	$22,019
Element #8: Monitoring (1)	0.00	$0	$0	$0	0.07	$7,019	$20,000	$27,019	$27,019
Element #9: Reporting (1)	0.01	$872	$0	$872	0.05	$5,013	$0	$5,013	$4,141
NPDES Permit Cumulative Subtotal (1)	1.69	$147,348	$42,500	$189,848	4.42	$443,177	$154,250	$597,427	$407,579
Element #10: Underground Injection Control Rule	0.00	$0	$0	$0	0.07	$7,019	$1,500	$8,519	$8,519

Table 7-1: Detailed SWMP and Gap Analysis Results

Storm Drainage Program Elements	Existing (2014) Staff FTE(2)	Existing (2014) Staff Cost ($)	Existing (2014) Expense Cost ($)	Existing Total Costs ($)	Future Staff FTE (2)	Future Staff Cost ($)	Future Expense Cost ($)	Future Total Costs ($)	Total Net Change
Other Stormwater Program Obligations Cumulative Subtotal	1.69	$147,348	$42,500	$189,848	4.49	$450,195	$155,750	$605,945	$416,098
Element #11: Stormwater Capital Improvement Program	0.14	$12,206	$710,000	$722,206	0.75	$75,200	$825,000	$900,200	$177,993
Stormwater Capital Improvement Program and Other Stormwater Program Obligations Cumulative Subtotal	**1.83**	**$159,554**	**$752,500**	**$912,054**	**5.24**	**$525,395**	**$980,750**	**$1,506,145**	**$594,091**
Element #12: Administrative and Additional Activities	0.26	$22,669	$313,557	$336,226	0.26	$26,069	$360,591	$386,660	$50,434
Total	**2.09**	**$182,223**	**$1,066,057**	**$1,248,280**	**5.50**	**$551,464**	**$1,341,341**	**$1,892,805**	**$644,525**
GRAND TOTAL	**$1,248,280**				**$1,892,805**				**$644,525**
TOTAL GAP					**(3.41)**	**($369,241)**	**($275,284)**	**($644,525)**	

Notes:
(1) Required SDP Elements of City's NPDES Permit
(2) Full Time Equivalent = FTE
(3) May be supported by Future Developer Fees

7.5 SWMP ENHANCEMENTS BASED ON CITY STAFF POLICY DECISIONS

The Regulatory Compliance (and CIP) Gap Analysis focused on comparing the activities of the City's existing SWMP to the requirements of a future Permit, as modeled after the NPDES Phase II 2013-2018 Permit for Western Washington. An expanded summary of the results of the "Regulatory Gap (and CIP) Analysis" for each of the twelve elements within the City's SWMP is presented below, including the enhancements that are needed for the City to comply with a future Permit. (Note: These SWMP enhancements presented below include only those SWMP increases that have been approved by City staff, and previously presented in Sections 7.3 and 7.4.3.)

7.5.1 Element #1: Public Education and Outreach

- Cost: Increase existing activities by $3,000 for expenses.
- Activity: Initiate a new public education program, with an emphasis on water quality.
- City's Existing SWMP: The City currently has no established public education and outreach program.
- Additional Permit Requirements: The issuance of a Permit will require the City to implement Public Education and Outreach activities that include:
  - Focusing Public Education and Outreach efforts on prioritized target audiences, including school-aged kids and mobile business.
  - IDDE, Low Impact Development (LID) Best Management Practices (BMPs), vehicle equipment, home/building maintenance, stormwater facility maintenance, etc., as part of the education outreach efforts.
  - Focusing on an education program for engineers, contractors, developers, and land use planners which includes technical standards for stormwater site and erosion control plans, LID principles, LID BMPs, and stormwater treatment and flow control BMPs/facilities.
  - Creating stewardship opportunities and/or building on existing organizations to encourage residents to participate positively in stormwater quality activities.
  - Measuring results of educational activities including understanding the adoption of the targeted behaviors for at least one target audience in one subject area.
  - Tracking and maintaining records of public education and outreach activities.

The City intends to develop a strong emphasis on stormwater quality, as the backbone of its new Public Education and Outreach program.

ELEMENT #1		ADDITIONAL RESOURCES		
	Existing SWMP Resource Staffing and Funding (A)	Recommended Increase Based on Regulatory (and CIP) Gap Analysis (B)	City's Preferred Level of Resource Allocation (C)	Total Resources Needed to Support Future SWMP (A+C)
Staff (FTE) Staff Costs ($)	0 $ 0	0.08 $ 8,021	0 $ 0	0 $ 0
Expense Costs ($)	$ 0	$ 3,000	$ 3,000	$ 3,000
Total Costs ($)	$ 0	$ 11,021	$ 3,000	$ 3,000

7.5.2 Element #2: Public Involvement and Participation

- Cost: Increase existing activities by $2,500 for expenses.
- Activity: Will need to create public participation opportunities, including SWMP and Annual Report to Ecology (when under a Permit).
- City's Existing SWMP: The City currently conducts some public involvement and participation activities, including:
  - Holding public meetings around the ownership and maintenance of stormwater retention/detention ponds.
  - Maintaining a website, the main venue for sharing information on the City's SWMP.
  - Sending out informational flyers and mailings on specific issues, as needed.
- Additional Permit Requirements: Issuance of a Permit will also require the City to implement additional Public Involvement and Participation activities including:
  - Developing a Stormwater Comprehensive Plan (SCP already being developed by the City) and Annual Reporting documents per the Permit requirements, annually due to Ecology every March.
  - Making the SCP and Annual Report available to the public for review and comment, no later than May 31 each year (when under a Permit).
  - Creating ongoing opportunities for the public to participate in decision-making processes involving the development, implementation, and update of the SCP, including advisory councils, watershed committees, and stewardship programs.

ELEMENT #2		ADDITIONAL RESOURCES		
	Existing SWMP Resource Staffing and Funding (A)	Recommended Increase Based on Regulatory (and CIP) Gap Analysis (B)	City's Preferred Level of Resource Allocation (C)	Total Resources Needed to Support Future SWMP (A+C)
Staff (FTE) Staff Costs ($)	0.02 $ 1,744	0.03 $ 3,269	0 $0	0 $ 1,744
Expense Costs ($)	$0	$ 2,500	$ 2,500	$ 2,500
Total Costs ($)	$ 1,744	$ 5,769	$ 2,500	$ 4,244

7.5.3 Element #3: Illicit Discharge Detection and Elimination (IDDE)

- Cost: Increase existing activities by $11,500 for expenses.
- Activity: Will need to develop and implement an IDDE program; start outfall screening and develop appropriate codes, fines, and enforcement procedures, as well as staff training.
- City's Existing SWMP: The City has started developing portions of a comprehensive IDDE program including:
  - Mapping a base stormwater system network, including location of facilities that contain some material and pipe diameter information.
  - Responding to illicit discharges and spills, as reported to the City or observed by staff.
  - Reporting spills generated by the City, primarily dealing with the City's Wastewater Department. Spill response is currently not a major issue for the City as a result of thorough code enforcement.
- Additional Permit Requirements: Issuance of a Permit will also require the City to implement the following additional IDDE activities:
  - Updating stormwater system mapping to ensure the City's stormwater system mapping is in compliance with the requirements of the Permit.
  - Developing and adopting an IDDE Ordinance per the requirements of the Permit.
  - Developing and implementing an IDDE Program per the requirements of the Permit.
  - Developing procedures for IDDE field assessments per the requirements of the Permit.
  - Conducting field screenings of three high priority receiving waters within the City and completing the field screenings of at least 40% of the City's conveyance system and outfalls on an annual basis.

- Conducting field assessments of at least one high priority receiving water; developing and implementing field screening methodology appropriate to the characteristics of the MS4 and water quality concerns.
- Initiating an investigation within 21 days of any report or discovery of a suspected illicit connection; immediately responding to all illicit discharges, especially spills that are determined to constitute a threat to human health and welfare or the environment. Investigate within seven days. *(All known illicit connections to MS4 must be eliminated.)*
- Conducting internal and public education on IDDE; establishing and publicizing an IDDE hotline; and performing and reporting spill IDDE responses to Ecology.
- Tracking number and type of illicit discharges, and feedback from IDDE public education efforts.
- Training staff responsible for the IDDE program; documenting and maintaining records of IDDE training.

ELEMENT #3		**ADDITIONAL RESOURCES**		
	Existing SWMP Resource Staffing and Funding (A)	**Recommended Increase Based on Regulatory (and CIP) Gap Analysis (B)**	**City's Preferred Level of Resource Allocation (C)**	**Total Resources Needed to Support Future SWMP (A+C)**
Staff (FTE) Staff Costs ($)	0.02 $ 1,744	0.39 $ 39,365	0 $ 0	0.02 $ 1,744
Expense Costs ($)	$0	$ 11,500	$ 11,500	$ 11,500
Total Costs ($)	$ 1,744	$ 50,865	$ 11,500	$ 13,244

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

- Cost: Increase existing activities by $5,750.
- Activity: Will need to adopt 2012 Manual and increase inspection and enforcement, including WQ monitoring of sites, and required increase in annual maintenance frequency.
- City's Existing SWMP: The City has started developing portions of a comprehensive program to Control Runoff from New Development, Redevelopment, and Construction Sites, including the following activities:

- Adopting the 2005 Ecology Manual.
- Permitting is done through the City's Community Development Department; plan review is done both in-house and through the City's contract on-call City Engineer.
- Developing a program regarding private facility maintenance and ownership. Currently, the City weeds and conducts debris removal at all private detention and retention ponds, even if on private property.
- Contracting stormwater facility inspections through the City's on-call City Engineer. Community Development is largely responsible for this process with any runoff or other issues being reported to code enforcement and Community Development. Public Works does conduct plan reviews and also receives complaints/concerns and makes field observations. Public Works staff typically work closely with the inspectors.
- Retaining copies of inspection reports in the Community Development and Public Works Departments, and with code enforcement.
- Participating in watershed-scale planning with the Stillaguamish Watershed Council.
- Assuring that one City staff member has a CECSL certification.

o <u>Additional Permit Requirements</u>: Upon issuance of a Permit, the City is also required to implement additional activities for a program to control runoff from new development, redevelopment, and construction sites, including:

- Adopting the 2012 Ecology Manual, including provisions to require Low Impact Development (LID) techniques.
- Ensuring permitting and plan review programs are consistent with the requirements of the 2012 Ecology Manual.
- Codifying the City's private facility inspection and maintenance program in the Stanwood Municipal Code.
- Adopting maintenance standards consistent with the 2012 Ecology Manual.
- Enforcing an inspection program for new treatment and flow control facilities annually, and all new stormwater treatment and flow control BMPs/facilities and catch basins of permanent residential developments every six months until 90% of the lots are constructed.
- Inspecting water quality and flow control facilities every six months during building construction.
- Making copies of the "Notice of Intent for Construction Activity" and/or "Notice of Intent for Industrial Activity"

ELEMENT #4		ADDITIONAL RESOURCES		
	Existing SWMP Resource Staffing and Funding (A)	Recommended Increase Based on Regulatory (and CIP) Gap Analysis (B)	City's Preferred Level of Resource Allocation (C)	Total Resources Needed to Support Future SWMP (A+C)
Staff (FTE) Staff Costs ($)	0.07 $ 6,103	0.50 $ 51,049	0 $ 0	0.07 $ 6,103
Expense Costs ($)	$0	$ 5,750	$ 5,750	$ 5,750
Total Costs ($)	$ 6,103	$ 56,799	$ 5,750	$ 11,853

7.5.5 Element #5: Municipal Operation and Maintenance

- Cost: Increase existing activities by $221,927 (fully funded: $168,927 for the staffing of 1.48 FTE, and $52,000 for additional expenses).
- Activity: Will need to increase annual maintenance including inspections, spot checks, training, development of SWPPP, and recordkeeping.
- City's Existing SWMP: The City has started developing portions of a comprehensive Operation and Maintenance Program including the following activities:
  - Adopting the 2005 Ecology Manual, but has no existing O&M Plan.
  - Inspecting structures, such as tide gates, at least twice annually; some other areas are inspected during heavy rains.
  - Cleaning and inspecting all catch basins and stormwater conveyance pipes at least once every two years by an outside contractor.
  - Entering into an Interlocal Agreement (ILA) with Snohomish County for maintenance work that has primarily been for pavement and roadway markings. The City is considering an ILA for pond maintenance and ditch cleaning.
  - Training Public Works staff on operation of the City's sweeper and vactor equipment. There has been no training of O&M staff on detention/retention pond maintenance and BMPs.
  - Using an iWorQ's work order system in the Public Works Department.
- Additional Permit Requirements: Issuance of a Permit will also require the City to implement additional Operation and Maintenance Program activities, including:
  - Adopting maintenance standards consistent with the 2012 Ecology Manual and develop/implement Stormwater O&M Standards.
  - Conducting annual inspections of City-owned stormwater treatment and flow control facilities, and performing needed maintenance actions.
  - Spot-checking stormwater treatment and flow control facilities after major stormwater events (>10-year recurrence interval); conducting repairs as needed.

- Inspecting all catch basins and inlets at least once every two years, and conducting needed maintenance.
- Implementing operation and maintenance practices, policies, and procedures to reduce stormwater impacts from all lands.
- Implementing training activities for all O&M staff and other applicable City staff whose primary job functions include O&M and construction.
- Developing and implementing a Stormwater Pollution Prevention Plan (SWPPP) document for the Public Works/Maintenance Yard.
- Continuing to keep O&M records of all activities using iWorQ.

ELEMENT #5		ADDITIONAL RESOURCES		
	Existing SWMP Resource Staffing and Funding (A)	Recommended Increase Based on Regulatory (and CIP) Gap Analysis (B)	City's Preferred Level of Resource Allocation (C)	Total Resources Needed to Support Future SWMP (A+C)
Staff (FTE) Staff Costs ($)	1.57 $ 136,885	1.48 $ 168,927	1.48 $ 168,927	3.05 $ 305,812
Expense Costs ($)	$ 42,500	$ 53,000	$ 53,000	$ 95,500
Total Costs ($)	$ 179,385	$ 221,927	$ 221,927	$ 401,312

7.5.6 Element #6: Program Implementation

- Cost: Increase existing activities by $1,000 for expenses.
- Activity: Will need to develop a program to track, record, and report annual SWM Program activities and costs to Ecology.
- City's Existing SWMP: The City has not yet started developing a compliance strategy for SWMP Implementation. The City will need to implement the following SWMP implementation activities upon issuance of a Permit, including:
  - Developing and implementing an SCP (as defined by the Permit) that projects future activities.
  - Preparing an Annual Report to Ecology, due in March of each year.
  - Tracking the cost or estimated cost of development and implementation of the SCP; providing information to Ecology upon request.
- Additional Permit Requirements: Additional expenses will be needed to implement the new activities for this element. As listed above, the City will need to develop a program to track, record, and report annual SWM Program activities and costs to Ecology; some additional expense money ($1,000) has been allocated for this purpose.

ELEMENT #6		ADDITIONAL RESOURCES		
	Existing SWMP Resource Staffing and Funding (A)	Recommended Increase Based on Regulatory (and CIP) Gap Analysis (B)	City's Preferred Level of Resource Allocation (C)	Total Resources Needed to Support Future SWMP (A+C)
Staff (FTE) Staff Costs ($)	0 $ 0	0.07 $ 7,019	0 $ 0	0 $ 0
Expense Costs ($)	$ 0	$ 1,000	$ 1,000	$ 1,000
Total Costs ($)	$ 0	$ 8,019	$ 1,000	$ 1,000

7.5.7 Element #7: TMDL for Stillaguamish River

- Cost: Increase existing activities by $15,000 for expenses.
- Activity: Will need new program to support TMDLs.
- City's Existing SWMP: The City is currently not required to conduct any activities related to the TMDL for the Stillaguamish River. However, compliance with these TMDL water quality actions will likely become a Permit requirement in the future. For additional information on the Stillaguamish River TMDL, see Chapter 3: Regulatory Requirements and Guidance Documents.
- Additional Permit Requirements: It is likely that additional expenses will be needed to implement these new activities for this element. Some additional expense money ($15,000) has been annually allocated for this purpose.

ELEMENT #7		ADDITIONAL RESOURCES		
	Existing SWMP Resource Staffing and Funding (A)	Recommended Increase Based on Results of Regulatory (and CIP) Gap Analysis (B)	City's Preferred Level of Resource Allocation (C)	Total Resources Needed to Support Future SWMP (A+C)
Staff (FTE) Staff Costs ($)	0 $ 0	0.07 $ 7,019	0 $ 0	0 $ 0
Expense Costs ($)	$ 0	$ 15,000	$ 15,000	$15,000
Total Costs ($)	$ 0	$ 22,019	$ 15,000	$ 15,000

7.5.8 Element #8: Monitoring

- Cost: Increase existing activities by $20,000 for expenses.
- Activity: Will likely need to pay Ecology an annual Permit regional monitoring fee similar to other municipalities (*this cost is an estimate from comparison with existing NPDES permittees).
- City's Existing SWMP: The City conducts the following stormwater monitoring activities:
  - In partnership with Snohomish County, the City has completed some stormwater monitoring for bacteria in Irvine Slough; additional annual monitoring is likely.
- Additional Permit Requirements: Issuance of a Permit will also require the City to implement additional monitoring program activities including:
  - If Stanwood's population exceeds 10,000 at the time of Permit issuance, the City may be required to opt in to pay Ecology to support their annual regional monitoring program, or develop and conduct status and trends monitoring, effectiveness monitoring, source identification, and diagnostic monitoring.

ELEMENT #8		ADDITIONAL RESOURCES		
	Existing SWMP Resource Staffing and Funding (A)	Recommended Increase Based on Regulatory (and CIP) Gap Analysis (B)	City's Preferred Level of Resource Allocation (C)	Total Resources Needed to Support Future SWMP (A+C)
Staff (FTE) Staff Costs ($)	0.00 $ 0	0.07 $ 7,019	0 $ 0	0 $ 0
Expense Costs ($)	$ 0	$ 20,000	$ 20,000	$20,000
Total Costs ($)	$ 0	$ 27,019	$ 20,000	$ 20,000

7.5.9 Element #9: Reporting

- Cost: Increase existing activities by $0.
- Activity: Will need a new program to develop an Annual Report and SCP to be submitted to Ecology; also will need to make records available to the public and write memo regarding local barriers to using LID.
- City's Existing SWMP: The City has started developing portions of their reporting program including the following activities:
  - Public Works uses iWorQ's work order system to track and document all SWMP-related activities.

- Additional Permit Requirements: Issuance of a Permit will also require the City to implement annual reporting program activities, including:
  - Developing and submitting an Annual Report to Ecology in March of each year.
  - Tracking all activities within the SWMP.
  - Continuing to maintain records of the SCP and all Permit-related activities with iWorQ.
  - Making records of SCP and Permit activities available to the public.
  - Writing and submitting a Low Impact Development (LID) Barriers memo to Ecology.

ELEMENT #9		ADDITIONAL RESOURCES		
	Existing SWMP Resource Staffing and Funding (A)	**Recommended Increase Based on Regulatory (and CIP) Gap Analysis (B)**	**City's Preferred Level of Resource Allocation (C)**	**Total Resources Needed to Support Future SWMP (A+C)**
Staff (FTE) Staff Costs ($)	0.01 $ 872	0.04 $ 4,140	0 $ 0	0 $ 872
Expense Costs ($)	$0	$0	$ 0	$ 0
Total Costs ($)	$ 872	$ 4,140	$ 0	$ 872

7.5.10 Element #10: Underground Injection Control (UIC) Rule

- Cost: Increase existing activities by $1,500 for expenses.
- Activity: Will need new activities to record, assess, and report UIC status to Ecology (as new UIC facilities are added to the City's drainage system).

  (Note: Ecology's UIC rule does not currently apply to the City of Stanwood, since the City currently has so few UIC facilities. However, it will become applicable as new UIC facilities are added to the City's growing drainage system. In anticipation of this future need, a small amount of funding has been proactively added to the City's new, updated SWMP for UICs. Outside support services consisting of $1,500, have been assigned for future UIC compliance, as shown in Table 7-1.)
- City's Existing SWMP: There is currently one public-owned UIC well within the City of Stanwood. (Note: Element #10, Compliance with the State UIC Rule, does not apply to the current SWMP, but will likely be needed within the City's SWMP in future years, especially when under a Permit.)

- Additional Permit Requirements: Resources have been allocated for the City to conduct the following activities in order to be in compliance with Ecology's UIC Rule in the future, including:
  - Registering future publically-owned UIC wells built within the City limits.
  - Developing and conducting a UIC assessment protocol.
  - Ensuring new UIC wells meet all state requirements.
  - Providing annual UIC reports to Ecology.
  - Ensuring all UIC well decommissioning meets the requirements of the state.

ELEMENT #10		ADDITIONAL RESOURCES		
	Existing SWMP Resource Staffing and Funding (A)	Recommended Increase Based on Regulatory (and CIP) Gap Analysis (B)	City's Preferred Level of Resource Allocation (C)	Total Resources Needed to Support Future SWMP (A+C)
Staff (FTE) Staff Costs ($)	0 $ 0	0.07 $ 7,019	0 $ 0	0 $ 0
Expense Costs ($)	$ 0	$ 1,500	$ 1,500	$1,500
Total Costs ($)	$ 0	$ 8,519	$ 1,500	$ 1,500

7.5.11 Element #11: CIP Program

- Cost: Increase existing activities by $177,993 for expenses (fully funded, however, no internal staffing; budget includes an additional $115,000 for CIP projects and $62,993 for CIP support staff (0.61 FTE), which will be contracted out with the other CIP work).
- Activity: Will need to increase small works program to include larger CIP projects and funding. (Note: This is not a Permit requirement; it is the City's annual Capital Improvement Program.)
- City's Existing SWMP: The City currently includes annual budget dollars for stormwater CIP Projects. The City does not currently have a long-term stormwater infrastructure replacement program; however, the City does have a small works project program through which they build small drainage improvement projects each year. The future program includes the design and construction of long-term stormwater infrastructure replacement projects, in addition to CIP Projects and small works projects.
- Additional Permit Requirements: Having an effective, annually-funded CIP is not a Permit requirement and will not likely become one in the future.

ELEMENT #11		ADDITIONAL RESOURCES		
	Existing SWMP Resource Staffing and Funding (A)	**Recommended Increase Based on Regulatory (and CIP) Gap Analysis (B)**	**City's Preferred Level of Resource Allocation (C)**	**Total Resources Needed to Support Future SWMP (A+C)**
Staff (FTE) Staff Costs ($)	0.14 $ 12,206	0.61 $ 62,994	0 $ 0*	0.14 $ 12,206
Expense Costs ($)	$ 710,000	$ 115,000	$ 177,994*	$ 887,994
Total Costs ($)	$ 722,206	$ 177,994	$ 177,994*	$ 900,200

**Note: New CIP support staff (of 0.61 FTE) have been outsourced and included in the CIP expenses of $177,994 ($115,000 for CIP expenses + $62,994 for 0.61 FTE in staffing).*

7.5.12 Element #12: Administrative and Additional Activities

- Cost: Increase existing activities $47,034 for expenses.
- Activity: Will need to increase administration costs; supplies will increase as will taxes and internal overhead costs
- City's Existing SWMP: Administrative and additional stormwater program activities and needs currently include:
  - Uniforms and Supplies for the stormwater program.
  - Program Overhead costs, including meetings, training, travel, inter-fund payments for service and transfers-out.
  - Insurance, B&O taxes, and State Operating Permits to support the Stormwater Program.
  - Miscellaneous Expenditures including communication costs.
- Additional Permit Requirements: Additional expenses will be needed to implement this SWMP element in the future; $47,034 has been allocated annually for this activity, in addition to what the City is currently spending on SWMP administration.

ELEMENT #12		ADDITIONAL RESOURCES		
	Existing SWMP Resource Staffing and Funding (A)	Recommended Increase Based on Regulatory (and CIP) Gap Analysis (B)	City's Preferred Level of Resource Allocation (C)	Total Resources Needed to Support Future SWMP (A+C)
Staff (FTE) Staff Costs ($)	0.26 $ 22,669	0 $ 3,400	0 $ 0	0.26 $ 22,669
Expense Costs ($)	$ 313,557	$ 47,034	$ 47,034	$ 360,591
Total Costs ($)	$ 336,226	$ 50,343	$ 47,034	$ 383,260

Summary:

Total annual SWMP (including CIP) based on City policy decisions for the revised SWMP is $137,320 less per year than is recommended in the Regulatory Gap Analysis presented in Appendix B and summarized in Table 7-1.

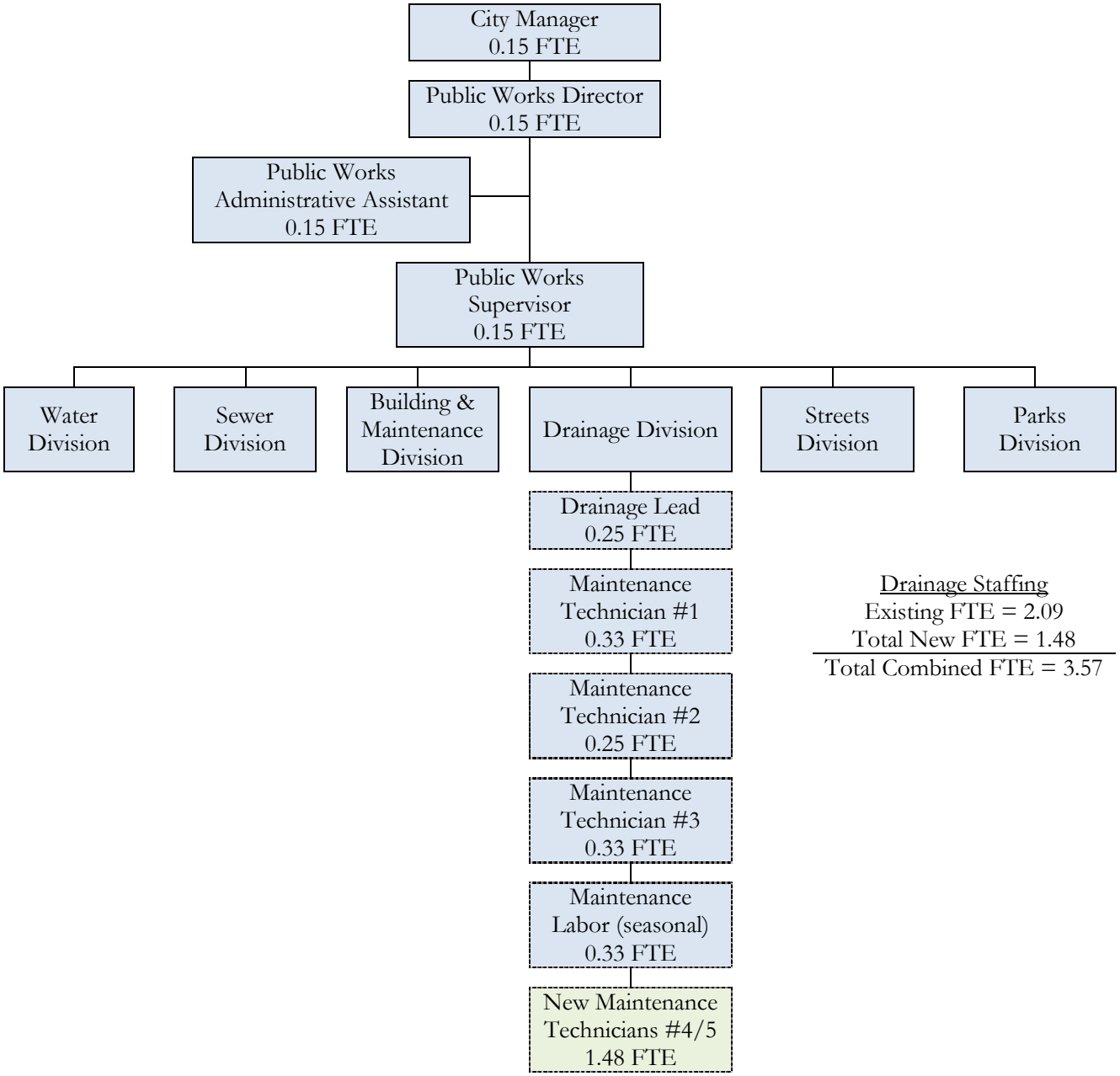
In summary, the net change or financial "gap" which needs to be met by the City on an annual basis in order to realize the recommended updated SWMP, as requested by City staff, is $507,205 per year. This update to the City's SWMP will increase total annual operating costs from $1,248,280 to $1,755,485. The updated annual SWMP includes the hiring of additional maintenance staff (1.48 FTE), an increase in CIP of $177,994, an increase in Operations and Maintenance of $221,927, an increase in Administration of $47,034, and an increase in other SWMP-related expenses of $60,250.

Compliance with a future Permit will cost the City's SWMP $329,211 per year of the projected $507,205 annual increase. This amount is calculated by summing the costs of SWMP Elements #1-12, subtracting out the annual amount needed for CIP ($177,944), and leaving in a sum of up to an additional amount of $47,034 to address the annual regional monitoring costs associated with a future Permit. This also leaves a small sum within the $47,034 to support future increases in annual Administrative costs.

7.6 ANNUAL STAFFING FOR NEW SWM PROGRAM

Annual permanent staffing will increase from 2.09 to 3.57 FTE, as discussed in sections 7.4 and 7.5. This is an increase of 1.48 FTE for SWMP maintenance, which will be increased incrementally over a five-year period on an as needed basis. Table 7-1, previously presented, summarizes future SWMP staffing needs and costs. The following organizational chart, presented in Figure 7-2, shows where the new staff will be placed within the maintenance group of the City's Drainage Division.

Figure 7-2: Public Works Organizational Chart showing Existing and Future SWMP Staff Positions



7.7 STORMWATER PROGRAM SUMMARY AND IMPLEMENTATION RECOMMENDATIONS

SWMP implementation conclusions and recommendations include the following:

- *Continue to Make Drainage a Priority:* It is clear from this SWMP and Regulatory Gap Analysis that, although the City has a history of flooding and drainage problems, it has taken a proactive approach in addressing both regulatory compliance and capital facility needs.
- *Proactive Planning is Critical:* This analysis will allow the City to further its SWMP vision and begin to raise the needed revenue to initiate the new CIP projects and prepare in advance for a future Permit.
- *New Revenues Needed/Optimization of Existing Revenue Sources:* Existing revenue sources need to be reviewed and new sources, especially for capital projects, will need to be identified. Review and development of all potential funding options is key to optimizing the creation of new revenues for stormwater management.
- *Water Quality/TMDL/Shellfish/Habitat:* Water quality will continue to be an important local and regional issue, requiring increased coordination and likely additional interlocal agreements and funding; pursuing grants would be a good financial strategy for this part of the City's SWMP.
- *Interagency Coordination Will Increase In Importance:* Partnering with other regional agencies will help share responsibilities and increase opportunities to attract new local and regional funding. The pending ISSSP will be a major step forward in identifying solutions and building the needed inter-jurisdictional support to dewater the low-lying western parts of the City.
- *Phasing In of Staffing to Ease Costs:* Staffing will likely need to be phased in over the next five years (or longer) as the SWMP grows; maintenance and capital programs will need staffing to be implemented on an annual basis.
- *Continued Proactive Approach is Critical:* It is recommended that the City continue to be proactive in regard to the Permit, water quality, TMDLs, and other local and regional water resources, flooding, and watershed-related issues. If the Permit were to be implemented today, the City would be significantly behind in terms of compliance, staffing, training, and revenues. The City needs to continue to be proactive in its planning in its preparation for a future Permit in order to gradually achieve Permit compliance, as local funding and staffing allow.

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APPENDICES

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A.1: City of Stanwood
SWMP Mission and Vision

A.2: City of Stanwood
SWMP Policies

A.3: 2012 List of Regional
Detention Facilities

A.4: WRIA 5 Ecology Publication
#11-11-010, August 2012

A.5: Memorandum of Understanding
between
City of Stanwood and Diking District 7

A.6: Snohomish County R/D
Pond Maintenance Agreement

A.7: Memorandum of Understanding
between City of Stanwood and
Stillaguamish Tribe
for Watershed Improvements, May 2013

A.8: NHC Technical Memorandum to
PACE Engineers, Inc., March 2014
"Modeling Needs Recommendations"

A.9: SWM Data List Request to City
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A.10: SWM Questionnaire
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A.11: SWM Public Survey
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A.12: Public Survey Selection of
Mailed Responses, January 2014

A.13: Public Survey
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A.15: 2004 Budget Summary,
Drainage Fund

A.16: Drainage Complaint Summary

APPENDIX A.1
CITY OF STANWOOD DRAINAGE UTILITY
VISION, MISSION, AND GOALS

The City's Drainage Utility was developed with a specific vision that is described in the following statements that clarify the Utility's vision, mission and goals.

Vision:

To preserve and enhance the standard of living for the people of Stanwood by restoring and protecting the unique natural environment and water quality of the Skagit River Valley in order to strengthen economic conditions and enhance the overall quality of life for its citizens.

Mission:

The Mission of the City of Stanwood's Drainage Utility is to create the annual funding needed to develop and maintain a comprehensive stormwater infrastructure management program that protects property, health and safety; enhances quality of life; preserves and improves the environment to be responsive and sensitive to the needs of residents, property owners, and public partners.

Goals:

The goal of the City's updated SCP is to:

- Address flooding problems with drainage improvement policies, practices and projects to reduce the occurrence of flood damage to property.
- Review, enact, and enforce ordinances and policies as needed to manage prevent future flooding in or downstream of developed areas.
- Enhance water quality to preserve the natural environment while planning for future regulatory compliance with the Department of Ecology's Western Washington NPDES Phase II Permit.
- Enhance the natural environment to benefit people, fish and wildlife and add to the quality of life of the City's citizens.
- Provide adequate and sustained funding for the City's Drainage Utility and the City's SWMP with an equitable stormwater utility rate.

APPENDIX A.2
CITY OF STANWOOD DRAINAGE UTILITY
DRAINAGE AND STORMWATER MANAGEMENT POLICIES

This is the City's first Stormwater Comprehensive Plan and with increasing occurrences of flooding and the possibility of a future NPDES Phase II Permit, it was the appropriate time for the City to develop a SCP. The SCP builds on existing SWM policies and practices of the City in order to ensure that the goals of the Drainage Utility and the needs of the City's unique drainage system are being met.

The above goals are met by the development and implementation of specific policies, each with their own unique set of objectives. The three sets of policies include:

- Policies for Drainage and Flow-Control
- Policies for Water Quality
- Policies for Utility Finances

Each set of policies are discussed below.

Drainage and Flow-Control Policies

The City of Stanwood has their own Stanwood Municipal Code (SMC) that contains drainage and flow-control policies. This section provides a brief summary of those policies.

According to SMC Section 17.140: *Stormwater Management Performance Standards* the City is responsible for:

- Ensuring that developments are consistent with the land use, utilities and natural features elements of the Stanwood Comprehensive Plan.
- Minimizing water quality degradation and sedimentation in rivers, streams, ponds, lakes, wetlands, and other water bodies.
- Minimizing the impact of increased runoff, erosion, and sedimentation caused by land development and maintenance practices.
- Maintaining and protect groundwater resources.
- Minimizing adverse impacts of alternations on ground and surface water quantities, locations, and flow patterns.
- Decreasing potential landslide, flood, and erosion damage to public and private property.
- Promoting site planning and construction practices that is consistent with natural topographical, vegetation, and hydrological conditions.
- Maintaining and protecting the City of Stanwood's stormwater management infrastructure and those downstream.

- Providing a means of regarding clearing and grading of private and public land, while minimizing water quality impacts in order to protect public health and safety.
- Providing minimum development regulations and construction procedures that will preserve, replace, or enhance, to the maximum extent practicable, existing vegetation to preserve and enhance the natural qualities of lands, wetlands and water bodies. (Ord. 1164 § 4, 2004; Ord. 1110 § 3, 2002; Ord. 929 Ch. 10(J)(1), 1995).

By design, the primary function of the City's stormwater system is to convey urban runoff away from homes and businesses in order to reduce flooding during major storm events. The following policies support the goal of managing urban drainage to protect public and private property:

- Continuing to use the design criteria presented in the Department of Ecology's 2005 Stormwater Management Manual for Western Washington (SMMWW) that requires stormwater systems to be designed by an engineer.[1]
- Implementing the Department of Ecology's 2005 SMMWW or the latest edition adopted by the City for the design and construction of all stormwater facilities on new development or redevelopment sites.
- Ensuring that stormwater planning efforts are consistent with the comprehensive planning efforts of the City's Planning Department (i.e. roads, land use, water, sewer, parks, etc.).
- Continuing development of a public education and outreach program on the issues of stormwater, water quality and urban drainage.
- Requiring improvements to the City's stormwater system as part of new and redevelopment projects.
- Utilizing historic rainfall data to properly size stormwater collection and conveyance systems, including stormwater trunk lines.
- Implementing an ongoing stormwater Capital Improvement Program to design, repair and replace stormwater infrastructure throughout the City.
- Continue participation in the Stillaguamish Watershed Council.

Water Quality Policies

The goal of reducing stormwater pollution and protecting water quality throughout the Drainage Utility Service Area is achieved by implementing the following:

- Planning for compliance with the Federal Clean Water Act through compliance with the existing Department of Ecology's Western Washington NPDES Phase II Permit (*earliest date the City may be issued a Permit would be most likely be August of 2018*).
- Implementation of the Department of Ecology's 2005 SMMWW for water quality treatment design.

[1] Stanwood Municipal Code 17.140.050

- Continued participation in the Stillaguamish Watershed Council.
- Encouragement of Low Impact Development practices in CIP projects and new/redevelopment projects.
- Encouragement of land-use practices that limit the amount of impervious surface areas, including clustering of homes in single-family residential developments and preservation of the natural drainage systems and supporting natural vegetation.
- Encourage onsite infiltration and the development of landscape and screening standards that facilitate the dual purposes of both stormwater runoff control and that of increased stormwater infiltration.
- Eliminate illicit discharges and connections throughout the City.
- Implement and enforce the City's ordinances to reduce stormwater pollution from illicit discharges, construction activities and the operation and maintenance of post-construction stormwater facilities.
- Use the 2012 Low Impact Development Technical Guidance Manual for Puget Sound[2] to guide the use of LID types of Best Management Practice (BMPs) throughout the City.
- Develop, adopt and enforce floodplain and critical areas ordinances that protect the natural drainage systems and require maintenance to keep those systems clear of debris.

Financial Policies

The City's financial goal is to provide adequate and sustained funding for the City's Drainage Utility, including the, City's SWMP.

The City's financial goal is to provide adequate and sustained funding for the Drainage Utility, including the, City's SWMP. In order to meet this goal, the Drainage Utility's financial policies are:

- Maintain equitable and local utility rates.
- Use drainage utility rate methodologies that are consistent with other Western Washington NPDES Phase II Permittees.
- Ensure the drainage utility rate will generate the revenue needed to cover operating and capital costs for the City's SWMP.
- Pursue grants and low-interest loan opportunities for capital improvement projects and SWMP activities.
- Develop a plan for long-term stormwater infrastructure replacement, and ensure that is included in Policy #2 above.

[2] http://www.psp.wa.gov/LID_manual.php

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2012 RETENTION POND LIST

Trevor, as of now what are we maintaining? After we find out what the city owns we can update the list if Kevin says we don't have the man power to maintain HOA ponds.

RETENTION PONDS (need address/location)	CITY OWNED	CITY MAINTAINES MOW & WEED X Per Yr	CITY MAINTAINES SPRAY X Per Yr	NOTES
EMERALD GLEN 1	X			
~~EMERALD GLEN 2~~				
LINDSTROM ~~(HAGGEN)~~	X			
VILLAGE COMMONS (MOVIE THEATER)	X			
FOX HILL	X			
CHURCH CREEK				Homewood development INC
LINCOLN	X			
VIEW RIDGE	X			
CANDLE RIDGE 1 (85th)	X			
CANDLE RIDGE 2 (283rd)				HOA
PIONEER HILLS SOUTH				HOA
PIONEER HILLS NORTH (MYRTLE)	X			
HERITAGE WETLANDS				
SUMERSET				HOA
CEDARHOME FARMS (281st Pl)				HOA
FALCON MEADOWS (Thisle)	X			
CEDARHOME ESTATES (69th)	X			
CEDARHOME VISTA (Duck Pond)	X			
EAGLE HEIGHTS #1 286th and 72nd	X			
~~EAGLE HEIGHTS #2~~				
KYLIE PARK 1 285th and 70th	X			
KYLIE PARK 2 (286th & 72nd)				
KYLIE PARK 3 287th and 72nd				KYLIE PARK HOA
HAWKS PRAIRIE (69th Ave & 282nd Pl)				
FARM HOUSE ESTATES (72ND & 284TH)				
TAYLORS LANDING				
POND 1 (68th & 280th) East side of 68th				school district
POND 2 (68th & 280th) West side of 68th				Homeowner
COPPER STATION				copper station developer
86th and 280th	X			

P:\Retention Pond List.xlsx

	Name		Status	Parcel	Tract	SQ FT	Notes
1	Candle Ridge	Detention Pond	Conveyed to City	87800099800	998	22,586	
1	Candle Ridge	Open Space	Conveyed to City	87800099800	999 (open)	14,384	
1	Candle Ridge	Open Space	HOA	87800010100	101 & 102 (open space)	136,272	
2	Candle Ridge Div II	Detention Pond	HOA		4	22,570	
2	Candle Ridge Div II	Open Space		904900099900	1	38,839	
2	Candle Ridge Div II			904900099900	2	20,111	
2	Candle Ridge Div II			904900099900	3	8,560	
3	Cedarhome Estates	Detention Pond	Conveyed to City	128000099900		17,606	
3	Cedarhome Estates		NGPA Conveyed to Lots 1-11			18,900	
4	Cedarhome Farms	Detention Pond	HOA		998	29,198	
4	Cedarhome Farms	Landscape Tract			997	4,664	
4	Cedarhome Farms	NGPA	NGPA		999	13,742	
5	Cedarhome Ridge	Detention Tract	HOA		999	17,168	
5	Cedarhome Ridge	NGPA	NGPA	1000700001000		15,053	Lot 10
6	Cedarhome Vista	Detention Pond	Conveyed to City	1012600099900		11,365	
7	Church Creek Estates	Open Space/Detention Pond	HOA	796800050100		65,280	
8	Copper Station	Detention Pond	HOA	1067300098600		57,470	
8	Copper Station	Sewer Lift Station	Conveyed to City	1067300098500			
8	Copper Station	NGPA	NGPA		994	18807	
8	Copper Station	NGPA	NGPA		992	42278	
8	Copper Station	NGPA	NGPA		990	34894	
8	Copper Station	NGPA	NGPA		989	14282	
8	Copper Station	NGPA	NGPA		988	63191	
8	Copper Station	Open Space			986	19007	
8	Copper Station	Open Space			987		
8	Copper Station	Open Space			991	46383	
8	Copper Station	Open Space			996	7141	
8	Copper Station				997	7143	
8	Copper Station				998	34828	
8	Copper Station				999	46466	
8	Copper Station	Recreational Area	HOA			72383	
9	Eagle Heights	Detention Pond	Conveyed to City		999	12002	
10	Emerald Glen	Open Space	HOA		997	266665	
10	Emerald Glen	Open Space	HOA		998	36025	
10	Emerald Glen	Detention Pond	Conveyed to City			8340	

	Name		Status	Parcel	Tract	SQ FT	Notes
10	Emerald Glen		Along with Baron Devpmt Group	320429000203100		29185	
11	Falcon Meadows	Detention Pond/Open Space	Conveyed to City			28744	
11	Falcon Meadows	NGPA	NGPA/Conveyed to City/ With Buffer			27701	
11	Falcon Meadows	NGPA	NGPA/With Buffers			19980	Lots 8, 9 & 10 with Buffers
12	Farmhouse Estates	Detention Pond	Conveyed to City	105100000100		7963	
13	Hawk's Prarie	Detention Pond	Conveyed to City	1045400099900		18581	
13	Hawk's Prarie	Open Space	HOA		998	43565	
14	Kylie Park I	Detention Pond	Conveyed to City	135600099900		54220	
14	Kylie Park I	NGPA	NGPA/HOA	135600099600	998	1012830	
15	Kylie Park II	NGPA	NGPA/HOA	1356000996	996	32529	
15	Kylie Park II		Access Easement for City		999 from 998 (access only)	15075	
16	Kylie Park III	Detention Pond	HOA			22403	
17	Lincoln Ridge	Detention Pond/Open Space	Conveyed to City	820100001800		39143	
18	Lindstrom Development	Detention Pond	Conveyed to City	32042900201300		199940	
19	Pioneer Hills	Detention Pond (Myrtle Rd)	Conveyed to City	89060009970		20259	
19	Pioneer Hills	Detention Pond (Nordic Way)	HOA	890600008000		16964	
19	Pioneer Hills	Detention Pond (Nordic Way)	HOA	890600008100		11918	
19	Pioneer Hills	Tot Lots	HOA			38553	Phase I
19	Pioneer Hills	Open Space	HOA		A	21755	Phase I
19	Pioneer Hills	Open Space	HOA		E	42387	Phase I
19	Pioneer Hills	Open Space	HOA		B	50608	Phase II
19	Pioneer Hills	Open Space	HOA		C	20601	Phase III
19	Pioneer Hills	Open Space	HOA		D	102015	Phase III
20	Summerset	Detention Pond	HOA		997	20340	
20	Summerset	NGPA	NGPA	1014500099800	998, 999	124734	
21	Taylor's Landing	Detention Pond	Conveyed to City	955800010200		20445	
21	Taylor's Landing	Open Space	HOA		103	23181	
21	Taylor's Landing	NGPA	NGPA/HOA	955800010100		106088	
22	View Ridge	Detention Pond	Conveyed to City	908700099800		8643	
22	View Ridge	Open Space	Conveyed to City	908700099800		7000	
23	Fox Hills	Detention Pond	Conveyed to City	859700099000		59172	
23	Fox Hills	Open Space/Retention Area	Conveyed to City	857700099000		224653	
24	Bay View Lane	Open Space/Detention Pond		871300099900	A	6301	
24	Bay View Lane	Open Space/Detention Pond		871300099900	B	13151	

	Name		Status	Parcel	Tract	SQ FT	Notes
10	Emerald Glen		Along with Baron Devpmt Group	320429000203100		29185	
11	Falcon Meadows	Detention Pond/Open Space	Conveyed to City			28744	
11	Falcon Meadows	NGPA	NGPA/Conveyed to City/ With Buffer			27701	
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15	Kylie Park II	NGPA	NGPA/HOA	1356000996	996	32529	
15	Kylie Park II		Access Easement for City		999 from 998 (access only)	15075	
16	Kylie Park III	Detention Pond	HOA			22403	
17	Lincoln Ridge	Detention Pond/Open Space	Conveyed to City	820100001800		39143	
18	Lindstrom Development	Detention Pond	Conveyed to City	32042900201300		199940	
19	Pioneer Hills	Detention Pond (Myrtle Rd)	Conveyed to City	89060009970		20259	
19	Pioneer Hills	Detention Pond (Nordic Way)	HOA	890600008000		16964	
19	Pioneer Hills	Detention Pond (Nordic Way)	HOA	890600008100		11918	
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19	Pioneer Hills	Open Space	HOA		A	21755	Phase I
19	Pioneer Hills	Open Space	HOA		E	42387	Phase I
19	Pioneer Hills	Open Space	HOA		B	50608	Phase II
19	Pioneer Hills	Open Space	HOA		C	20601	Phase III
19	Pioneer Hills	Open Space	HOA		D	102015	Phase III
20	Summerset	Detention Pond	HOA		997	20340	
20	Summerset	NGPA	NGPA	1014500099800	998, 999	124734	
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23	Fox Hills	Detention Pond	Conveyed to City	859700099000		59172	
23	Fox Hills	Open Space/Retention Area	Conveyed to City	857700099000		224653	
24	Bay View Lane	Open Space/Detention Pond		871300099900	A	6301	
24	Bay View Lane	Open Space/Detention Pond		871300099900	B	13151	

DEPARTMENT OF ECOLOGY
State of Washington

Focus on Water Availability

Water Resources Program **Revised August 2012**

Stillaguamish Watershed, WRIA 5

This focus sheet provides information on the availability of water for new uses in the Stillaguamish Watershed. This information provides a starting point for potential water users in determining the best strategies for securing water for a future project or proposal in this area.

The Stillaguamish Watershed, also known as Water Resource Inventory Area 5 (WRIA 5), is situated in the central part of Puget Sound and comprises the northwestern part of Snohomish County and the South central part of Skagit County. On its west side it is bounded by Puget Sound and its east side includes portions of the Cascade Mountain range. This watershed is sparsely populated.

This watershed includes the Stillaguamish River and its two forks which originate in the Cascade Mountains. The watershed also includes various smaller streams such as Jim, Pilchuck, and Canyon creeks.

Yearly precipitation ranges from 30-35inches in the coastal area to over 150 inches in the Cascades Mountains. Most of this precipitation arrives during the winter months when water demands are the lowest, and only a fraction becomes available for human and economic uses. During the summer, the snowpack is gone and there is little rain so low stream flows are dependent on groundwater inflow. This means that groundwater and surface water are least available when water demands are the highest.

Much of the water in the Stillaguamish watershed is already legally spoken for ("appropriated"). Increasing demands for water from ongoing population growth, declining groundwater levels in some areas and the impacts of climate change have put Washington's water supplies at risk. The Stillaguamish Watershed increasingly lacks water when and where it is needed, particularly during the summer months.

Factors affecting water availability

Most of the basin is closed to new withdrawals of both surface water and groundwater, due to the potential adverse impacts on protected streams and rivers.

Definitions

Consumptive use: A use of water that diminishes the quantity or quality of water in the water source.

Instream flow rule: Establishes a water right for streams in a particular watershed. The rule specifies the amount of water needed in a particular place for a defined time for each stream. Typical instream flow rules now include broader water management strategies.

Maximum allocation limits: Limits on total withdrawals available above the instream flow levels for specific streams at specific times.

Mitigation plan: A scientifically-sound plan intended to avoid impairment to existing water rights or capturing water from a closed source.

Reservation: A reservation of water is a one-time finite amount of water set aside for specific future uses. Reservations typically provide year-round water and have conditions of use required to access them.

Permit-exempt well: The state Ground Water Code allows for certain uses of small quantities of groundwater without obtaining a permit from Ecology. (RCW 90.44.050)

Instream Resources Protection and Water Resources Program rule

WRIA 5 has an instream flow and water management rule (WAC 173-505) to protect senior water rights, maintain a healthy ecosystem, and to meet future water resource management objectives. Such rules are required by state law (RCW 90.54).

There are currently specific, finite amounts of water available from reservations of water established in the rule for new year-round consumptive uses. But once these limited amounts are appropriated, obtaining new year-round water supplies in this watershed will be a very difficult, expensive, and lengthy process requiring technical studies, mitigation plans, and possible legal assistance due to potential adverse impacts on protected streams and rivers. The reservations of water are discussed in the next section.

Limits on surface water diversions and groundwater withdrawals during high flows
WAC 173-505 establishes maximum allocation limits on certain rivers at certain times, to preserve the environmental benefits of natural annual high flows. These are discussed in the next section.

Coastal areas of Puget Sound
Any proposed water withdrawals in the coastal areas of Puget Sound are evaluated for the risk of seawater intrusion into fresh groundwater supplies. Coastal applicants may need to develop an adequate mitigation plan to address the risk of seawater intrusion.

Water currently available for new uses

Reservations of water for specific purposes
Specific, finite quantities of water are available for domestic (household) uses and for stock watering purposes.

- Domestic reservation: 5 cubic feet per second (cfs) is reserved for permit-exempt groundwater use for domestic purposes. This total amount is further allocated as follows (WAC 173-505-090):
  - A maximum of 2 cfs can be appropriated from the North Fork Stillaguamish basin.
  - A maximum of 1.5 cfs can be appropriated from the South Fork Stillaguamish basin.
- Stock watering reservation: 1 cfs is reserved for stock watering uses on riparian grazing lands (WAC 173-505-080).

Interruptible water supplies
New water rights outside of the reservations are available, but would be subject to interruption when instream flows are not met on the Stillaguamish River and designated tributaries. Due to hydraulic connection between groundwater and surface water, groundwater use is also limited by surface water flows.

Withdrawals from lakes and ponds are limited to single in-house domestic uses only, not to exceed 150 gallons per minute (gpm). (WAC 173-505-060)

Maximum allocation limits on certain rivers
At certain times of the year, there is some water above the instream flows available for new uses. However, to preserve the environmental benefits of natural annual high flows, the rule limits the total amount allowed for allocation in specific streams at specific times. Uses are subject to the instream flows – that is, the water use may be interrupted if stream flow levels fall below the instream flows.

Name	Dates	Maximum total allocations (cfs=cubic feet per second)
Canyon Creek	Dec 1 – May 31	40 cfs
North Fork Stillaguamish River from river mile 17.6 to headwaters	Nov 1 – June 30	120 cfs
North Fork Stillaguamish River to river mile 17.6	Oct 16 – June 30	150 cfs
Pilchuck Creek	Oct 16 – May 31	50 cfs
South Fork Stillaguamish River	Nov 1 – June 15	150 cfs
Squire Creek	Nov 1 – Feb 15 and May 1 – June 30	20 cfs
Stillaguamish River	Oct 16 – June 30	300 cfs

Additional options for water supplies

You are encouraged to connect to an existing water system if available. This is the simplest and fastest option.

The groundwater permit exemption allows certain users of small quantities of groundwater (most commonly, single residential well owners) to construct wells and develop their water supplies without obtaining a water right permit from Ecology. (For more information about the groundwater permit exemption, refer to www.ecy.wa.gov/pubs/fwr92104.pdf.) The permit exemption may not be available to prospective water users in certain areas that have been closed to further appropriation because there is limited or no water available. Check with Ecology staff at the regional office for more information.

If you cannot hook-up to an existing system and are unable to access water from the reservations, processing an application through the Cost Reimbursement Program may be an option www.ecy.wa.gov/pubs/0511016.pdf.

For more information on this and other options, refer to "Alternatives for Water Right Application Processing" www.ecy.wa.gov/pubs/1111067.pdf.

Pending water right applications in this watershed

Washington water law is based on the "prior appropriation" system, often called "first in time, first in right." Applications for water from the same source must be processed in the order they are received. (There are certain exceptions, see "Additional options for processing water right applications" above.)

Ecology asks anyone who needs a water right (new, change, or transfer) to submit the pre-application consultation form and meet with us to review your water supply needs and project proposal.

- Apply for a New Water Right
  http://www.ecy.wa.gov/programs/wr/rights/newrights.html
- Apply to Change or Transfer a Water Right or Claim
  http://www.ecy.wa.gov/programs/wr/rights/change_transfer_use.html

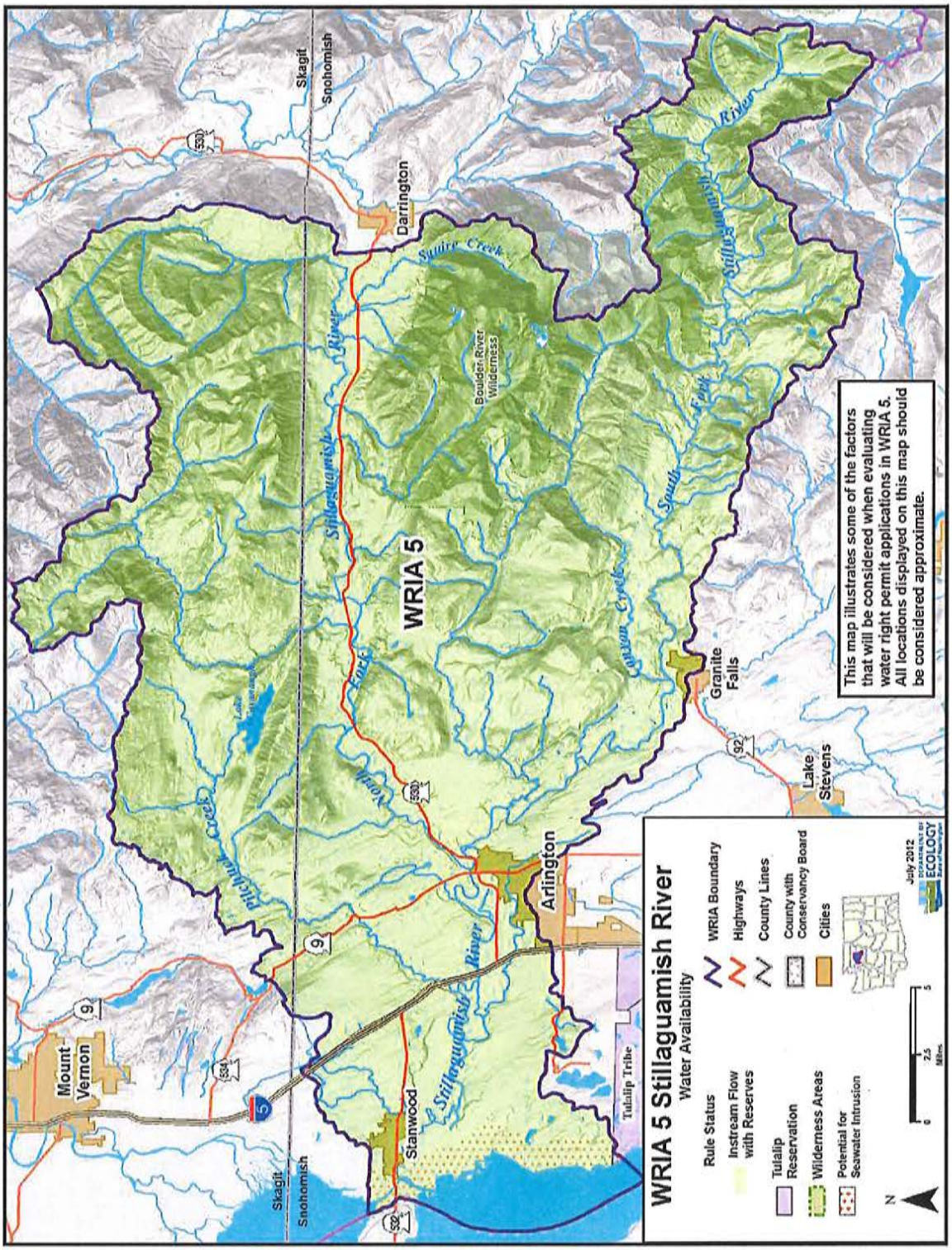
The map in this document shows some of the factors that will be considered when evaluating water right permit applications. Here are some information sources to assist you with your research:

- Locate and research water rights on land parcels anywhere in the state (Water Resource Explorer) http://www.ecy.wa.gov/programs/wr/info/webmap.html
- Pending Water Right Applications by County http://www.ecy.wa.gov/programs/wr/rights/tracking-apps.html
- Subscribe to a water right application RSS feed for a county or WRIA http://www.ecy.wa.gov/programs/wr/rights/wr_app_rss.html
- WRIA map showing the total number of water right claims, certificates, permits and applications http://www.ecy.wa.gov/programs/wr/rights/Images/pdf/waterright_wria_opt.pdf
- Search and view well reports using a variety of search tools http://apps.ecy.wa.gov/welllog/

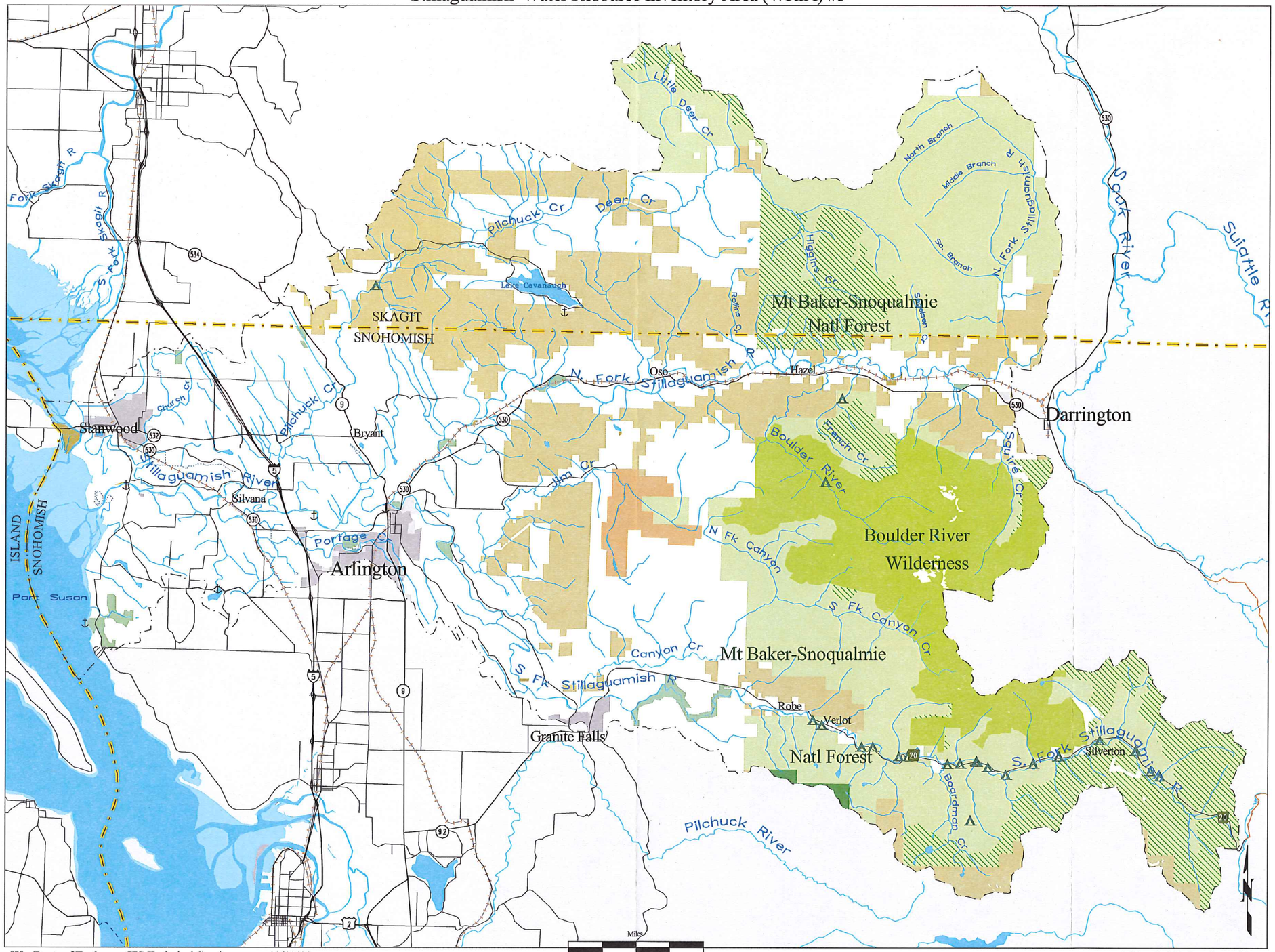
For more information

Northwest Regional Office
Water Resources Program
3190 160th Ave. SE
Bellevue WA 98008
425-649-7000

If you need this document in a version for the visually impaired, call the Water Resources Program at 360-407-6872. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.


WRIA 5 Stillaguamish River
Water Availability
Rule Status
Instream Flow with Reserves
Tulalip Reservation
Wilderness Areas
Potential for Seawater Intrusion
WRIA Boundary
Highways
County Lines
County with Conservancy Board
Cities
July 2012
ECOLOGY
WRIA 5
Mount Vernon
Skagit
Snohomish
Stanwood
Arlington
Darrington
Granite Falls
Lake Stevens
Tulalip Tribe
Boulder River Wilderness
Squire Creek
Pilchuck Creek
Canyon Creek
This map illustrates some of the factors that will be considered when evaluating water right permit applications in WRIA 5. All locations displayed on this map should be considered approximate.

Stillaguamish Water Resource Inventory Area (WRIA) #5



Wa. Dept. of Ecology, GIS Technical Services 10/12/11

Major Public Lands mpl5

ORIGINAL

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding ("MOU") is entered into as of November 1, 2012 ("Effective Date") by and between the City of Stanwood (the "City") and Drainage and Diking District 7 (the "District").

RECITALS

A. On March 7, 2012, a large sink hole was discovered on the seaward side of the District's sea dike. The sink hole was caused by a partial collapse of three tide gate culverts that drain the District's interior ditches. The District alerted the city and the county and filled the sinkhole with "fish mix" material as a temporary fix to keep the sea dike intact.

B. The District sent a letter to the City on June 1, 2012 requesting $25,000 to help repair the tide gates and restore the dike. City staff began working with District representatives to understand the nexus between the request and the City's proportionate share of the problem.

C. At the City council meeting on July 26, 2012, representatives from the District presented information regarding needed repairs to the sea dike west of Stanwood adjacent to Skagit Bay.

D. At the City council meeting on August 6, 2012, the City council discussed the District's request for a $25,000 contribution from the City to assist with funding the project. The City council directed staff to work with the District to determine a "nexus" between the project and the City's proportionate share, if any, to fund the needed repairs.

E. City staff reviewed technical documentation prepared by Snohomish County Surface Water Management (SWM) and other technical experts indicating the following nexus between the City of Stanwood and the District:

i. Storm water runoff from the City of Stanwood within the Douglas Creek Drainage Basin passes through the District's boundaries to reach Skagit Bay.

ii. Lack of efficient drainage to the sea could cause ground water to build up on the North-west side of Stanwood. Possibly impacting West Stanwood.

iii. Failure of the tide gate structure to close properly could put Stanwood at risk from sea water inflow at high tide and that water will not drain out efficiently since the agricultural land is now lower than the sea side.

iv. The dike structure at the tide gates or elsewhere could fail (collapse- wash away) in a storm tide situation and really flood from the north and west.

F. The tidgate and levee repair was completed in August and inspected by Snohomish County Surface Water Management. The final project accounting and as-built drawings have been received by City staff.

AGREEMENT

1. The Obligations of District and the City.

1.1 Diking and Drainage District 7 Obligations. In order to ensure long-tem maintenance and repair of the sea gates, levy and diking systems within the District's boundaries, the District shall:

1.1.1 Develop an annual maintenance plan that meets minimum best management practices for sea gates, levies, dikes and other flood control structures within the District that are adequately maintained during their useful life.

1.1.2 Prepare a 6-year and 20-year capital facilities plan for District facilities taking into account potential sea level increases and drainage run-off from surrounding watersheds.

1.1.3 Identify additional revenue sources to support long-term maintenance and repair of the District's sea gates, dikes and levy systems including but not limited to: increasing the District's levy rate; annexing additional areas into the District, applying for Federal, State and local grant funding; and negotiating interlocal agency agreements with Snohomish and Skagit Counties.

1.1.4 Construct improvements within the District's boundaries as needed to meet future population growth within the surrounding urban and rural areas that drain through the District's boundaries.

1.2 City Obligations. The City shall:

1.2.1 Obligate $8,600 towards the August 2012 repair of the sea gates north of the City limits to help protect the City from flooding during storm events and severe high tides.

1.2.2 Work with the District and Snohomish County to develop an annual maintenance plan that meets best management practices for retention, detention and conveyance of storm water within the area of the City that is a part of the Douglas Creek Drainage Basin.

1.2.3 Work with the District to secure additional revenues to support long-term maintenance and repair to the District's sea gates, dikes and levy system.

1.2.4 Consider adoption of low-impact development standards within the Douglas Creek Watershed.

2. Purpose and Effect of the Memorandum of Understanding (MOU). The purpose of this MOU is to document certain understandings reached by the District and the City. The District and the City acknowledge that additional binding documents (plans, funding, resolutions, etc.) are necessary to implement the terms of this MOU, and that such additional documents will be subject to substantive review and approval by the District and the City.

3. Term. This Memorandum of Understanding shall continue until the earlier of the effective date of an Interlocal Agency Agreement between the District, City and other Stakeholders within the Douglas Creek Drainage Basin or five (5) years from the Effective Date of this MOU.

4. Scope of This MOU. The Parties hereto have endeavored in this MOU to set forth their current understandings and intent solely with respect to the matters addressed herein. This MOU is not, however, intended to set forth in full detail the terms and conditions under which the parties may elect to proceed in the future in regard to maintaining, repairing, and/or improving sea gates, levies and other flood control structures within the District's boundaries. Any future commitments or obligations beyond those specifically set forth in sections 1.1 and 1.2 above shall be memorialized in a separate written agreement or instrument. Except as specifically provided herein, nothing contained in this MOU shall be construed to create a duty or obligation to the other party or any duty which exceeds that established under the law.

5. Notices. Any notices to be delivered on matters pertaining to this MOU shall be addressed as follows:

   If to the District

   Tyler Breum
   31718 Pioneer Hwy
   Stanwood, WA 98292

   If to the City:

   Mayor, City of Stanwood
   10220 – 270th Street
   Stanwood, WA 98292

6. Amendment to the MOU. This MOU may be amended only by a written instrument signed by the parties. The party proposing the amendment shall bear all costs of amendments to this MOU.

7. Waiver. The waiver by either party of a breach by the other of any provisions of this MOU shall not constitute a continuing waiver of any subsequent break of either the same or a different provision of this MOU.

8. Attorney's Fees. In the event any legal action is brought to enforce or interpret this MOU, the prevailing party shall be entitled to an award of reasonable fees, in addition to any other relief to which it may be entitled. Venue for any such action will be in Snohomish County.

9. Severability. The provisions of this MOU are severable. If any portion of this MOU is held invalid by a court of competent jurisdiction, the remainder of the MOU shall remain in full force and effect unless amended or modified by mutual written consent of the parties.

10. Dispute Resolution. In the event any dispute, disagreement, claim or controversy arises between the Parties concerning this Agreement or any of the provisions hereof (each, a "Disputed Matter"), Representatives from each party will meet and attempt to resolve the Disputed Matter through negotiations. If the representatives are unable to reach agreement, the Disputed Matter shall be referred jointly to the Mayor and a District Commissioner. If such individuals are unable to resolve the Disputed Matter within ten (10) days, then either the City or District may, upon written notice, submit the matter to mediation.

    Either party may commence mediation by providing to the other party a written request for mediation, setting forth the subject of the Disputed Matter and the relief requested. The parties will cooperate with one another in selecting a mediator and in scheduling the mediation proceedings. The parties each covenant that they will participate in the mediation in good faith, and that they will share equally in the costs of such mediation. Neither party may commence a civil action with respect to any Disputed Matter submitted to mediation until after the completion of the initial mediation session or 45 days after the date of filing the written request for mediation, whichever occurs first. Mediation may continue after the commencement of a civil action, if the parties so desire.

Executed as of the effective date, November 1, 2012.

THE CITY OF STANWOOD, a Washington municipal corporation

By: Dianne White

Mayor Dianne White

Its:

DIKING AND DRAINAGE DISTRICT 7, a Washington special district

By: Glen Johnson, Commissioner

Its:

ORIGINAL

AMENDMENT NO. 1 TO
INTERLOCAL AID AGREEMENT FOR MINOR STREET PROJECTS FOR MUNCIPAL SERVICES

THIS AMENDMENT NO. 1 TO INTERLOCAL AID AGREEMENT FOR MINOR STREET PROJECTS FOR MUNCIPAL SERVICES (the "First Amendment") is made and entered into this 27th day of ~~April~~ JUNE, 2013, by and between Snohomish County, a political subdivision of the State of Washington (the "COUNTY"), and City of Stanwood, a municipal corporation of the State of Washington (the "CITY").

WHEREAS, the COUNTY and the CITY executed an agreement entitled "Aid Agreement for Minor Street Projects for Municipal Services" (the "Original Agreement") on November 17, 1999, recorded under Snohomish County Auditor's File No. 200109250615;

WHEREAS, the COUNTY and the CITY wish to eliminate dollar limits on maintenance services commensurate with RCW 36.75.207 and RCW 35.77.020 through .040;

WHEREAS, the COUNTY and the CITY wish to further define "maintenance services" for purposes of complying with RCW 36.75.207 and RCW 35.77.020 through .040;

WHEREAS, the COUNTY and the CITY wish to include provisions by which to provide each other with notice as may be required under the Original Agreement and this First Amendment;

NOW, THEREFORE, for and in consideration of the mutual benefits conferred on both parties, the parties agree as follows:

Section 1. Section 1, subsection b of the Original Agreement is amended to read as follows:

For purpose of this Agreement, "municipal services" shall include but not be limited to the following:

1. Construction of small capital projects on City streets and bridges, not subject to mandatory competitive bidding, as determined by the City, and which do not exceed $10,000 for a single project or activity as established by state law.

2. Maintenance services on City streets and bridges (including, but not limited to the list of municipal road and street services contained in Appendix A and B), to maintain the facility, as nearly as practical in its original as constructed condition or its subsequently improved condition, and the operation of roadway facilities and services to provide satisfactory and safe motor vehicle transportation.

City of Stanwood
Contract #2013-025

3. Engineering and administrative services including clerical services, necessary for the planning, establishment, construction, and maintenance of the streets and bridges of the City.

Section 2. A new section, Section 10, is added to the Original Agreement to read as follows:

Notice. All notices required to be given by any party to the other under this Agreement shall be in writing and shall be given in person or by mail to the addresses set forth below. Notice by mail shall be deemed given as of the date the same is deposited in the United States mail, postage prepaid, and addressed as provided in this paragraph.

Owen Carter, P.E.
County Engineer
Department of Public Works
3000 Rockefeller Avenue, M/S 607
Everett, WA 98201

Kevin Hushagen
Director of Public Works
City of Stanwood
26729 98th Drive NW
Stanwood, WA 98292

Section 3. All other terms and conditions of the Original Agreement shall remain in full force and effect except as expressly modified by this First Amendment.

IN WITNESS WHEREOF, the parties hereto have executed this First Amendment as of the day and year first written above.

COUNTY:

Snohomish County, a political subdivision of the State of Washington

By _____
Name: Owen B. Carter, P.E.
Title: County Engineer

CITY:

City of Stanwood, a municipal corporation of the State of Washington

By _____
Name: Dianne White
Title: Mayor

Approved as to Form:

06-27-13
Deputy Prosecuting Attorney

Approved as to Form only

City Attorney

APPENDIX A
MUNICIPAL ROAD AND STREET SERVICES
Snohomish County - Road Maintenance Division

Work Operations (Estimates provided on a per project basis)
Drainage:
• **Catch Basin Routine Maintenance:** Manually clean catch basins to ensure drainage flow is not restricted. This includes removing debris from the inlet and/or cleaning the catch portion of the structure.
• **Catch Basin Mechanical Cleaning:** Mechanically remove sediment and debris from the catch basin using a vactor or eductor truck using vacuum hose and water jet as necessary to ensure drainage system remains free of material and flows are not restricted.
• **Culvert Cleaning, and Inspection, Manual:** Inspecting and manually cleaning culvert inlets and outlets.
• **Culvert Cleaning, Mechanical:** Use mechanical equipment for cleaning the culvert such as vactor, flusher or a backhoe to clean inlets and outfalls to remove obstructions.
• **Detention/Retention Basin Maintenance:** Remove accumulated sediment, vegetation and debris from detention/retention basins to maintain design capacity to allow for proper function of the structure. Removal may be by manual or mechanical means and may include cleaning inlet and outlet grates/pipes.
• **Ditch Maintenance:** Cleaning or re-shaping a man-made, open, storm water conveyance system that was constructed to carry storm water onto, through, or away from the highway right-of-way (i.e., not a modified stream). This operation does not include the acquisition of any permitting if required.
• **Underground Retention/Detention Facility Maintenance:** Mechanically or manually clean and/or inspect underground detention/retention facilities on the right of way to maintain proper design capacity for the structure. This activity requires compliance with confined space regulations.
Pavement Maintenance and Repair:
• **Crack and Joint Sealing:** Repair defects in pavement surface by installing crack filling material to prevent water from entering the sub-grade. Cracks are cleaned and routed prior to filling.
• **Install Lane Markers/Raised Pavement Markers:** Install lane markers to replace worn markers or to facilitate design changes in the channelization.

• **Installation, Maintenance and Repair of Guardrail:** Maintain and repair guardrail; adjust cable tension; repair damage caused by collisions; upgrade terminal end sections; adjust height and alignment; Install new guardrail to design specifications.
• **Manual Pavement Patching:** To repair the road surface by hand spreading asphalt mix (typically hot mix), raking to establish proper grade and compacting with a roller or other available means. Repair potholes, edge failures, dips, etc.
• **Pavement Markings -Thermo-plastic/Durable:** Apply durable channelization material (typically thermo-plastic) to the roadway to delineate the lane limits.
• **Pavement Markings - Paint**: Applying channelization to the roadway surface to delineate lane limits, such as edge lines (including gore lines), skip lines, no pass lines, centerlines, etc.
• **Sweeping & Cleaning Pavement with Mechanical Pickup Broom:** Use mechanical pickup sweeper to remove sand, dirt and accumulated debris from the roadway and shoulders. Special consideration: An advance person may be needed to pick up large debris prior to the sweeping operation. Additional trucks may be needed to haul the sweeper spoils to an approved waste site. 'No Parking' signs may be needed in advance.
• **Traffic Sign Repair, Replacement, Maintenance and Installation:** Repair, replace, maintain; or install new traffic signs to ensure operational safety is maintained on the roadway system.
Shoulder Maintenance:
• **Grade / Reshape Shoulders:** Use motor grader to pull aggregate from shoulder slope back towards the roadway to eliminate the vertical edge at the edge of pavement.
• **Shoulder Buildup Removal:** Use a motor grader and belt loader to remove buildup of sand, dirt and vegetation at the edge of shoulder to allow for proper drainage.
Snow & Ice:
• **Anti-Icing and De-icing Application, Liquids:** Apply anti-icing liquid to the roadway to reduce the probability of ice forming on the roadway. Apply de-icing liquids to the roadway to aid in ice removal.
• **Plowing/Sanding/Solid Deicer Application:** Remove accumulated snow and slush from the roadway and shoulder of the roadway with a truck-mounted snowplow. Apply sand or other abrasives to roadways to improve traction during freezing weather and snowstorm conditions. This may include sand applied with pre-wet salt systems or blended with salt in solid form.
Vegetation:
• **Control Vegetation Obstructions - Manual:** Remove vegetation obstructions by manual methods, i.e. shovels, weedeaters, cutters or pulling weeds, to ensure visibility of signing and intersections.
• **Cutting/Pruning/Selective Thinning:** Use hand tools to cut, trim or thin small amounts of plants in or around planting beds.

• **Noxious and Nuisance Weed Control - Spot Spray Non-power Equipment:** Use hand sprayer to control noxious weeds, as identified on the state or county noxious weed list, with approved herbicides applied at the recommended application rate. Also manually spray nuisance weeds. An herbicide application record is required for the treated area.
• **Nuisance Vegetation Control - Manual:** Use of manual means, i.e., hand operated trimmers, mowers, lopping shears, hand sprayer, saws, axes, to control undesirable vegetation obstructing line of sight or clear zone i.e., alders, blackberries and certain species of grasses.
• **Nuisance Vegetation Control - Mechanical:** Use power-operated equipment, i.e., mowers and brush cutters, to control undesirable vegetation i.e., alders, and blackberries, etc.
• **Tree Trimming/Tree Canopy Maintenance:** Use boom truck/bucket truck, saws and chippers to trim trees and canopied/encroaching shrubs to maintain clear zones, sight distance, pedestrian access, etc.
• **Roadside Mowing:** Mow with mechanical mower to control grass height and trim undesirable vegetation.

Other services provided:
• **Call-out Response for urgent or emergency situations**
• **Catch Basin/ Manhole Repair or Replacement**
• **Chip Seals; Project or Patching**
• **Culvert Repair or Replacement**
• **Guidepost and Delineator Replacement**
• **Hauling and Disposal of Waste Material**
• **Hydro Seeding and Mulching**
• **Instructor, Equipment Training and Other Training Courses**
• **Maintenance and Repair of Concrete Structures**
• **Mechanical Pavement Patching, Paverbox**
• **Noxious Weed Control - Mechanical**
• **Noxious Weed Control - Manual**
• **Pavement Milling/Full Depth Repair (small, localized areas)**
• **Pavement Patching with Subgrade Repair**
• **Rip Rap and Cribbing Repair**
• **Seeding, Mulching, and Planting including native species.**
• **Shoulder Washout Repair**
• **Slope Repair, Slide Clean up & Maintenance**
• **Traffic Control for Mobile Operations**
• **Traffic Control for Stationary Operations**
• **Vactor Waste Recycling/Disposal**

APPENDIX B
MUNICIPAL ROAD AND STREET SERVICES
Snohomish County – Bridge Operations

Work Operations (Estimates provided on a per project basis)
Bridge Inspection:
• **Bridge Inspection Services:** Routine and special bridge inspections, completion of bridge inspection reports (including photos and descriptions of the inspection), and entry of bridge inspection data into the Washington State Bridge Inventory System. The County's performance of inspections and reports shall be consistent with the National Bridge Inspection Standards as set forth in the current version of the Washington State Bridge Inspection Manual.

Other services provided:

MEMORANDUM OF UNDERSTANDING BETWEEN THE STILLAGUAMISH TRIBE AND THE CITY OF STANWOOD FOR COORDINATED WATERSHED IMPROVEMENTS

This Memorandum of Understanding ("MOU") is entered into as of May 1, 2013 by and between the City of Stanwood (the "City") and Stillaguamish Tribe (the "Tribe").

RECITALS

A. As government entities, the Tribe and the City ("Parties") have a common responsibility within the Stillaguamish Watershed to protect and enhance habitat for Chinook salmon and other species listed as threatened or endangered under the Endangered Species Act (ESA).

B. One of the primary missions of the Stillaguamish Tribe is to manage, protect, and conserve those natural resources that are required to sustain healthy populations of fish, shellfish, and wildlife within the Stillaguamish Watershed.

C. The City of Stanwood has an additional responsibility to meet the goals of Vision 2040 and to protect and provide urban levels of service within its corporate limits under the Growth Management Act (GMA).

D. The Tribe and the City have approved the Stillaguamish Salmon Recovery Plan. The Recovery Plan is intended to provide guidance to local stakeholders in a collaborative effort to restore and protect Chinook salmon populations in the Stillaguamish River watershed.

E. The Recovery Plan recommends habitat projects to restore watershed processes that affect Chinook salmon populations, protection of existing habitat through regulatory and nonregulatory strategies, stewardship education and outreach, and a monitoring and adaptive management plan.

F. Stanwood's location at the confluence of Stillaguamish River, Port Susan Bay and Skagit Bay is adjacent to habitat restoration sites identified in the Stillaguamish Salmon Recovery Plan and supported by the Stillaguamish Watershed Council.

G. The Salmon Recovery Plan recommends informing adjacent property owners and other stakeholders during feasibility and design phases to ensure broad-based community support and appropriate project design.

H. The City of Stanwood and the Stillaguamish Tribe are seeking to work together as government entities, co-partners, and adjacent property owners to meet their shared and individual responsibilities under the Growth Management Act and Endangered Species Act.

FINDINGS

A. The Stillaguamish Tribe has identified areas for estuary habitat enhancement that encompass the Stillaguamish floodplain, Port Susan Bay and Skagit Bay.

B. The Stillaguamish Tribe has purchased land commonly known as the "Matterand Property" with the intent of removing the levees that protect the land from salt water inundation in order to restore the land to estuary habitat. The Matterand property is adjacent to the city limits of Stanwood.

B. Computer modeling of the proposed project indicate removing the levees protecting the Matterand Property could result in increased siltation and reduced function at two locations where the city's stormwater is discharged into the Stillaguamish river.

C. The Stillaguamish Tribe is seeking funding from the Washington State legislature and other public sources to perform additional studies to determine the potential impacts of removing the levees around the Matterand property.

D. The City of Stanwood has identified capital improvements adjacent to the Matterand property including property acquisition, stormwater management, passive recreation facilities, habitat restoration and flood protection.

E. There is an opportunity for the City and the Tribe to partner together and jointly review scientific data, studies, and public input in support or opposition of proposed capital investments to meet the goals of the City and the Tribe.

AGREEMENT

1. The Obligations of Tribe and the City.

1.1 Obligations. In order to ensure participation and input on proposed projects with the potential to impact the City and/ or the Tribe, the Parties shall:

1.1.1 Meet early in the environmental review process in order to establish an initial agreement regarding the process for the government-to-government consultations.

1.1.2 Engage in both formal and technical consultation concerning applicable issues (e.g., modeling, scientific reports, etc.).

1.1.3 Invite representatives to all working group meetings.

1.1.4 Meet with elected and appointment officials and appropriate committees at major project milestones.

1.1.5 Keep representatives informed throughout the project planning, permitting and development process. In acknowledgement that the Parties must afford each other with more than the opportunity to participate as members of the general public in the planning and permitting process, the Parties will take the following actions to ensure there is effective government-to-government consultation:

1.1.5.1 Seek input regarding alternatives and opportunities to avoid, reduce, or otherwise mitigate the effects of the project on city interests.

1.1.5.2 Seek comment throughout the project's environmental review, permitting and regulatory review processes.

1.1.5.3 Give positive consideration to comments received throughout the permitting, regulatory, planning, and design processes of the project.

1.1.6 Engage in an open exchange of information about the project, its potential impacts, and appropriate mitigation.

1.1.7 Resolve effects projects may have on either Parties' responsibilities under the GMA and ESA.

1.1.8 Reach a full and fair settlement on any related issues in a manner that is compatible with the mutual interests of the City, the Tribe, and the objectives of the project.

1.1.9 Work to secure additional revenues to support planned and proposed capital investments.

2. Purpose and Effect of the Memorandum of Understanding. The purpose of this MOU is to document certain understandings reached by the Tribe and the City. The Tribe and the City acknowledge that additional binding documents (plans, funding, resolutions, etc.) may be necessary to implement some terms of this MOU, and that such additional documents will be subject to substantive review and approval by the Tribe and the City. Nevertheless, both parties intend that this MOU create obligations that each party agree to undertake.

3. Term. This Memorandum of Understanding shall continue until either party gives written notice sixty (60) days prior to the anniversary of the effective date.

4. Not Entire Agreement. The Parties hereto have endeavored in this MOU to set forth their understanding and intent with respect to the matters addressed herein. This MOU is not, however, intended to set forth in full detail the terms and conditions under which the parties are to proceed in regard to maintaining and repairing sea gates, levies and other flood control structures within the Tribe's boundaries.

5. Notices. Any notices to be delivered on matters pertaining to this MOU shall be addressed as follows:

   If to the Tribe

   Chairman, Stillaguamish Tribe
   3310 Smokey Point Drive
   Arlington, WA 98223

   If to the City:

   Mayor, City of Stanwood
   10220 – 270th Street
   Stanwood, Wa 98292

6. Amendment to the MOU. This MOU may be amended only by a written instrument signed by the parties. The party proposing the amendment shall bear all costs of amendments to this MOU.

7. Waiver. The waiver by either party of a breach by the other of any provisions of this MOU shall not constitute a continuing waiver of any subsequent break of either the same or a different provision of this MOU.

8. Attorney's Fees. In the event any legal action is brought to enforce or interpret this MOU, the prevailing party shall be entitled to an award of reasonable fees, in addition to any other relief to which it may be entitled. Venue for any such action will be in Snohomish County.

9. Severability. The provisions of this MOU are severable. If any portion of this MOU is held invalid by a court of competent jurisdiction, the remainder of the MOU shall remain in full force and effect unless amended or modified by mutual written consent of the parties.

10. Dispute Resolution. In the event any dispute, disagreement, claim or controversy arises between the Parties concerning this Agreement or any of the provisions hereof (each, a "Disputed Matter"), Representatives from each party will meet and attempt to resolve the Disputed Matter through negotiations. If the representatives are unable to reach agreement, the Disputed Matter shall be referred jointly to the Mayor and the Tribal Chairman. If such individuals are unable to resolve the Disputed Matter within ten (10) days, then either the City or Tribe may, upon written notice, submit the matter to mediation.

    Either party may commence mediation by providing to the other party a written request for mediation, setting forth the subject of the Disputed Matter and the relief requested. The parties will cooperate with one another in selecting a mediator and in scheduling the mediation proceedings. The parties each covenant that they will participate in the mediation in good faith, and that they will

share equally in the costs of such mediation. Neither party may commence a civil action with respect to any Disputed Matter submitted to mediation until after the completion of the initial mediation session or 45 days after the date of filing the written request for mediation, whichever occurs first. Mediation may continue after the commencement of a civil action, if the parties so desire.

Executed as of the date first written above.

THE CITY OF STANWOOD, a Washington municipal corporation

By:_____ Date:_____

Mayor Dianne White

Its:

Stillaguamish Tribe, a Native Sovereign Nation

By: _____ Date:_____

Chairman Shawn Yanity

Its:

Memorandum

Northwest Hydraulic Consultants
16300 Christensen Road, Suite 350
Seattle, WA 98188
206.241.6000
206.439.2420 (fax)

DATE: March 31, 2014 NHC PROJECT: 200155

TO: Joe Simmler

COMPANY/AGENCY: Pace Engineering

FROM: Derek Stuart, P.E.

SUBJECT: Modeling Needs Recommendations for Stanwood Stormwater Comprehensive Plan

Background

The City of Stanwood (City) is in the process of updating their Stormwater Comprehensive Plan with assistance from a consultant team consisting of Pace Engineers and its subconsultant Northwest Hydraulic Consultants (NHC). One of the primary objectives of the updated plan is to create a stormwater CIP Plan that addresses flooding concerns within the City. A draft inventory of these concerns consisting of more than 50 items was completed in early March, 2014 and the City has requested that NHC provide a summary of the benefits and costs of hydrologic and hydraulic stormwater modeling to define projects at a level necessary for incorporation in the updated plan. NHC's recommendations for stormwater modeling are included herein.

Potential Uses of Stormwater Models

Before recommending where stormwater models are most warranted for application within the City, it is necessary to first review what questions they are most commonly used to answer. There are three basic types of questions relating to stormwater system infrastructure that stormwater models are most commonly used for. These types of questions are listed below along with some hypothetical example questions and answers.

1. **Risk Characterization –**

   Question: What is the risk of flooding due to limitations in the existing stormwater system due to future development (additional impervious area), or other factors (e.g. sea-level rise, sedimentation, etc.)?

   Answer: Main Street is currently expected to flood to greater than 1 foot of depth once every 10 years but will flood to that depth once every 2 years when the City's full zoning density is full built-out.

2. **Identification of Problem Locations –**

   Question: What elements in my stormwater system are not meeting my performance standard?

   Answer: The flooding at the mayor's house is caused by a pipe on 92nd Avenue that is too small to convey runoff from the 25-year storm (a common design standard).

3. **Sizing New Infrastructure for CIP Planning and Design –**

   - How big does the pipe, ditch, or channel need to be to prevent flooding in the 25-year storm?
   - How big does a pump and/or pump-station forebay volume need to be to convey the 50-year storm?
   - How large does a stormwater pond or infiltration facility need to be to control the total volume of runoff in my stormwater system during storm events?
   - How tall does the levee or floodwall need to be to exclude riverine flood waters from downtown?
   - What are water quality design discharges for water quality treatment?
   - How much sediment can we allow to accumulate in our system without compromising performance?

All three of these types of questions listed above are applicable within the City of Stanwood but within the context of the CIP project, identification of problem locations and sizing of new infrastructure are the two uses most needed.

Prioritizations and Estimated Costs for Stanwood CIP Plan Modeling

The City's stormwater modeling options were prioritized by reviewing the City's draft inventory of drainage problems to identify those that would answer the questions listed above. Those with an identified modeling need were grouped together into eight areas of the City that could be addressed with a single model or modeling approach. These areas are mapped in Figure 1 (attached). Additional background detail for the drainage issues in each area is also provided in Appendix A.

Each modeling area was then assigned a ranking with respect to its priority for being modeled within with the scope of the current Stormwater Comprehensive Plan budget; these are provided in Table 1 (below). There are actually 10 total modeling options listed in Table 1 because Area 7, Irvine Slough, has three different options that could be selected independently of one another. It is important to note that the provided modeling costs include the labor to size of a needed conveyance component but detailed drawings, technical documentation, quantities estimates, and other aspects of CIP design are not included. The budget originally set aside for modeling and CIP design was approximately $30,000 (some of that was used to develop this memorandum and other related activities).

The first five modeling areas are drainages in the lowland portion of the City that all flow from north to south and currently discharge into Irvine Slough; these were assigned the highest

modeling priority of all the areas in the City (all are 5 or higher). With the exception of Area 2, where the stormwater collection system is not functioning properly, it is believed that flooding in these areas is caused by the limited capacity of Irvine Slough. The proposed addition of a new stormwater collection system on the north side of SR-532 (referred to here as the Irvine Slough Separation Project) is intended to remedy that limitation and allow these drainages to discharge freely during storm events. We have assigned a high modeling priority to these areas because: 1) the results could be used immediately to size conveyance systems for CIP plan cost estimates, 2) the results would indicate if a new regional conveyance system north of SR-532 would be inadequate to eliminate flooding in these areas without local improvements, and 3) they are relatively low cost to model. Lovers Lane Road (Area 6) could easily be added to the modeling of 92nd Avenue (Area 5), but it was placed at a slightly lower priority of 7 because the problems are limited to roadway flooding and the County may look at these culverts as part of their Douglas Creek investigation.

The three modeling options for Area 7, Irvine Slough, are more costly than those in Areas 1 through 6 and as a result were assigned lower priorities. The most urgent being a 6 for determining the needed height for a new berm on the south side of SR-532 (Option 7A). Option 7B, sizing new pump station upgrades for Irvine Slough Pump Station, was assigned a low priority of 8 because Snohomish County may also evaluate this option as part of their Douglas Creek investigation. And we recommend that complete modeling of the new stormwater system on the north side of SR-532 (Option 7C) be deferred to the Irvine Slough Stormwater Separation Project which will have a more appropriate level of funds to properly model the system for preliminary design.

The uplands, Area 8, are not recommended for modeling at this time. Information about identified problems could be achieved in these areas but the benefits from modeling are limited and the costs are not warranted in our opinion.

Recommendation

NHC recommends that the City perform stormwater modeling of the 5 or 6 drainages that flow from north to south into Irvine Slough as part of the Stormwater Comprehensive Plan. This modeling could be performed for between $7,000 and $17,500, depending on how many of the areas are included. NHC could model these areas and still have resources available within the existing budget to provide some additional CIP solution design for these and other drainage issues included in the inventory. The problems relating to Irvine Slough in Area 7 are best addressed by the Irvine Slough Stormwater Separation Project.

If you have any questions about these options please contact us. We look forward to coordinating with the City to determine what modeling they want to pursue at this time.

Table 1: Modeling Area Costs and Prioritization				
Area Modeling Options	**Priority Ranking**	**Reasoning for Ranking**	**Approximate NHC Modeling Labor Costs**	**Additional Comments**
Area 1 - 101st Ave System	2	The need for a new collection system in this area has been noted by City staff and the model is a good tool to help with sizing for cost estimating.	$7000 alone or additional $2500 with Areas 1-5	
Area 2 - 102nd Avenue System	3	Results will determine if flooding problems are due to only to Irvine Slough or if local improvements are needed. Related to Area 1.	$7000 alone or additional $2500 with Areas 1-5	
Area 3 – 98th Avenue System	5	No known flooding problems but it would compliment modeling of Areas 1, 2, 4 and 5 as a systematic modeling approach to this portion of the City.	$7000 alone or additional $2500 with Areas 1-5	
Area 4 – 94th Avenue System	4	Results will determine if flooding problems are due to only to Irvine Slough or if local improvements are needed.	$7000 alone or additional $2500 with Areas 1-5	
Area 5 – 92nd Avenue System	1	There is a known limitation in this portion of the system that needs to be corrected. Results will determine if flooding problems are due to only to Irvine Slough or if local improvements are needed.	$9,500 alone or additional $5000 with Areas 1-5	More costly than Areas 1-4 due to flow splits and inflow complexities related to Lovers Lane Road.
Area 6 – Lovers Lane Road System	7	This area should only be modeled if Area 5 is. Modeling this area would help determine if correcting these culverts would correct flooding along Lovers Lane Road.	Additional $1500 with Area 5	

Area 7, Option A – Irvine Slough (SR-532 Berm)	6	This modeling is needed for accurate budgeting of a floodwall alternative.	$15,000	Would require additional model calibration to large flood data.
Area 7, Option B – Irvine Slough (Upgrades to Irvine Slough Pump Station)	8	We recommend it be evaluated as part of the City's delayed for the Irvine Slough Stormwater Separation Project.	> $15,000	Would require additional model calibration to large flood data.
Area 7, Option C –New Stormwater Conveyance System on North Side of SR-532	9	There are not resources available in this project to do a complete modeling effort of this portion of the proposed system and have any resources left for CIP design. We recommend it be delayed for the Irvine Slough Stormwater Separation Project.	NA	
Area 8 – Upland Portions of the City	10	The drainage problems in the upland portions of the City can generally be addressed without stormwater modeling.	NA	

Appendix A – Drainage Concerns by Modeling Area

The drainage concerns, potential solutions, and recommended stormwater modeling approach for each area are listed below.

Area 1 – 101st Ave System
Drainage Concern: During rains in early 2014, this system was observed by the City to flood. It is reported that the storm system inlets are not at the grade needed to capture runoff from the land surface.

Potential Solutions: The CIP solution for this area could require adjustments to inlets in the existing system or a new stormwater collection system network design to capture runoff and prevent ponding during storm events.

Stormwater Modeling Approach: The proposed system would be modeled to identify the proper pipe sizes as needed to complete CIP design cost estimates. Modeling would be performed with an assumption that Irvine Slough or an alternative downstream system would prevent backwater effects through the system.

Area 2 – 102nd Avenue System
Drainage Concern: There are multiple drainage complaints within Area 2 (#30, #42, and #62). These complaints report leaking pipes and ponding during small frequent rainstorms.

Potential Solutions: Leaking pipes in this area would need to be repaired or replaced and ponding in yards is an indication that pipes may need to be upsized if the capacity limitations are not solely due to backup from Irvine Slough.

Stormwater Modeling Approach: The existing pipes along 102nd Ave., 270th St., and Augusta would be modeled to evaluate if they have adequate capacity. If they do not, then new collector pipes would be sized for CIP designs needed cost estimating. Modeling would be performed with an assumption that Irvine Slough or an alternative downstream system would prevent backwater effects through the system.

Area 3 – 98th Avenue System
Drainage Concern: There no known problems with the 98th Avenue system. This would be added for consistency with the analysis of Area 2.

Potential Solutions: Pipes may need to be upsized if there are capacity limitations that are not solely due to backup from Irvine Slough.

Stormwater Modeling Approach: The existing pipe along 98th Avenue and Camano would be modeled to evaluate if it has adequate capacity. If it does not, then a new collector pipe would be sized for CIP designs needed cost estimating. Modeling would be performed with an assumption that Irvine Slough or an alternative downstream system would prevent backwater effects through the system.

Area 4 – 94th Avenue System
Drainage Concern: There are multiple drainage complaints within Area 4 (#4, #46, #51, and #52). These complaints report ponding during small frequent rainstorms.

Potential Solutions: Ponding in yards is an indication that pipes may need to be upsized if the capacity limitations are not solely due to backup from Irvine Slough.

Stormwater Modeling Approach: The existing pipes along 271st St. and 94th Ave. would be modeled to evaluate if they have adequate capacity. If they do not, then new collector pipes would be sized for CIP designs needed cost estimating. Modeling would be performed with an assumption that Irvine Slough or an alternative downstream system would prevent backwater effects through the system.

Area 5 – 92nd Avenue System

Drainage Concern: There are multiple drainage complaints within Area 5 (#27, #28, #34, #37, #43, #63, and others in Area 6). These complaints report ponding during small frequent rainstorms.

Potential Solutions: GIS data shows that the stormwater system along 92nd Avenue is constructed in a manner that does not drain efficiently. This and ponding in yards is an indication that pipes may need to be modified. It is likely that the capacity limitations are not solely due to backup from Irvine Slough.

Stormwater Modeling Approach: The existing pipes along 92nd Ave. and 271st Street would be modeled to evaluate if they have adequate capacity. If they do not, then new collector pipes would be sized for CIP designs needed cost estimating. Modeling would be performed with an assumption that Irvine Slough or an alternative downstream system would prevent backwater effects through the system.

Area 6 – Lovers Lane Road System

Drainage Concern: There are multiple drainage complaints within Area 6 (#5, #12, and #29). Water ponds up in roadway across from Heritage Park on the north side of the road.

Potential Solutions: GIS data shows that culverts on Lovers Lane Road are not properly graded. This ponding could also be caused by restrictions on 92nd Avenue.

Stormwater Modeling Approach: The Lovers Lane system would be modeled with the 92nd Avenue system in Area 5. The model would correct the culverts in the system to see if their modification would stop the flooding currently experienced in the system. Modeling would be performed with an assumption that Irvine Slough or an alternative downstream system would prevent backwater effects through the system.

Area 7A – Irvine Slough (SR-532 Berm)

Drainage Concern: There are multiple drainage complaints within Area 7 (#25 is related to SR-532). It is reported that during large floods the Old Stillaguamish River Channel can overtop SR-532 and flow north into the City of Stanwood causing damage from flooding.

Potential Solutions: The City has proposed to build a berm or floodwall along the south side of SR-532 to prevent flows from the Old Stillaguamish River channel from crossing SR-532.

Stormwater Modeling Approach: The existing HEC-RAS model of Irvine Slough and the Old Stillaguamish River Channel would be used to calculate the height of the needed floodwall

and/or berm. We would recommend some additional calibration of the model to ensure it accurately replicates water levels observed during historic flood events.

Area 7B – Irvine Slough (Upgrades to Irvine Slough Pump Station)
Drainage Concern: There are multiple drainage complaints within Area 7 (#22, #24, and #56), and others near the WWTP that are related. It is reported that during large floods the Irvine Slough Pump Station does not have adequate capacity.

Potential Solutions: The City has proposed adding a new pump or multiple pumps to the pump station.

Stormwater Modeling Approach: The existing HEC-RAS model of Irvine Slough and the Old Stillaguamish River Channel would be used to calculate reduction in water levels that could be achieved by increasing the pumping capacity of the pump station. We would recommend some additional calibration of the model ensure it accurately replicates observed in Irvine Slough.

Area 7C –New Stormwater Conveyance System on North Side of SR-532 (Complete System)
Drainage Concern: During large floods the Old Stillaguamish River channel can leave its right bank and enter Irvine Slough near the Park and Ride east of Larson's Dam at 92nd Avenue. Any of the flow that crosses Larson's Dam is then combined with the City's stormwater that is also discharged through multiple outfalls to Irvine Slough. The Irvine Slough Pump Station cannot keep up with all of this flow.

Potential Solutions: The City has proposed to build a new separate conveyance system on the north side of SR-532 that discharges immediately west of the Irvine Slough Pump Station or even further west beyond the Twin City Foods plant.

Stormwater Modeling Approach: The proposed conveyance system could be modeled and sized using HEC-RAS to provide a conceptual design that would be used to develop expected CIP design cost.

Area 8 – Upland Portions of City
Drainage Concern: There are multiple drainage concerns in this area. Most of these are isolated problems relating to storm drainage conveyance or stormwater pond designs.

Potential Solutions: There are a series of small works projects that could remedy most of these problems areas.

Stormwater Modeling Approach: The solutions for these areas do not warrant stormwater modeling.

Stanwood Stormwater Comprehensive Plan
Initial SWM Data Request

PACE Engineers, Inc. – Prepared by J. Christofferson and D. Stuart
December 12, 2013

Data Request (*as applicable and available*)

- GIS Data: Stormwater System (e.g. RH2 data used to produce figure "stasdsys.pdf", 1995 drainage inventory, and/or others), surveys of stream channels or ditches not included in the stormwater system inventory, Land Use, Land Cover, Zoning and ROW limits, Soils, Streets, City/County Boundaries, Topography (contours and/or LIDAR), Aerials (current and/or historic flood imagery), Parcel Data, ~~topography, LIDAR,~~ FEMA Mapping, other applicable data available.
- As-built drawings for stormwater system construction or modification (this may include WSDOT drawings for SR-532 drainage features).
- Copy of the City's Stormwater Program O&M Plan and O&M records
- Copy of the existing City's Stormwater CIP Plan - indicate if any of the projects have been completed
- 2013/2014 Stormwater Program Budget Information including expenses and FTE
- Stormwater Management Program Organization Chart
- Drainage Complaints (*Flooding, Erosion, Water Quality, and other additional drainage related complaints*) from Engineering/O&M Staff & the Public including addresses & descriptions of complaints over the last five years. Include photos and detailed descriptions.
- A record of known problematic maintenance locations within the stormwater system.
- List of known data-sources providing a record of flood levels in the Stillaguamish River, Irvine Slough, or elsewhere within the City after 1948. This may include anecdotal information (e.g. "SR-532 was under about 2' feet of water in January 2009", or "water was at the top of the bank in February 1996") or, preferably, a surveyed inventory noting a specific high-water mark elevation.
- Records of pumping activities at the Irvine Slough pump station (e.g. known discharges from pump station, or noted periods when pumping capacity during a flood was limited by a mechanical or other problem).
- Copies of related past studies (*in addition to those listed below*), including any H&H analysis previously conducted within the City's boundary
- *Any additional drainage/stormwater related data*

Data Collected

- Snohomish County Flood Insurance Study (2005) – includes City of Stanwood
- Forum to address flooding issues from Douglas Creek Article in the Herald Net (Feb. 2013)
- Sinkhole near Stanwood fixed just in time article in Herald Net (Aug. 2012)
- NFIP Biological Opinion for Puget Sound (September 2008)
- Trying to Keep Water at Bay in Seattle Times (March 2005)
- City of Stanwood Shoreline Master Program: Draft Shoreline Inventory and Analysis (April 2010)
- City of Stanwood Flood Hazard Management Plan: Phases I and II (July, June 1997)
- Dike and Drainage Improvement 7: Request for Funding to Repair Tide Gate – City Council Agenda (October 2012)

- Stanwood Municipal Code
- Stanwood Urban Growth Area Drainage Needs Reports, DNR No 7 by Snohomish County (December 2002)
- Stillaguamish River Watershed TMDL for Temperature : Studies and Reports by the Department of Ecology

MEMORANDUM

Date: March 12, 2014

To: Kevin Hushagen - Public Works Director
Lisa Noonchester – Public Works Administrative Assistant

From: Joe Simmler – PACE Engineers, Inc.
Jessica Christofferson – PACE Engineers, Inc.

Subject: Stormwater Management Program Questionnaire

Copies: File

Project Number:

Presented below is a Stormwater Program Questionnaire aimed at collecting information about the City's Stormwater Management Program. We have structured this inquiry to be consistent with the past and existing regulatory requirements of the Western Washington NPDES Phase II Municipal Stormwater Permit. The more information we have about your current SWM Program and what you are accomplishing with existing sources of funding, the more accurate we can be in developing future revenue needs and funding mechanisms. As we get further into our analysis of the Utility's existing Stormwater Program. Our objective is to make sure we are giving you credit for everything related to your Stormwater Management Program before we determine resources needed for the future.

Attachment #1 provides a more detailed questionnaire that we would typically provide an NPDES Phase II Permittee to be used as an information guide for the City of Stanwood.

SWMP Element #1 - Public Education and Outreach

1. Describe the activities utilized by the City for stormwater education and outreach.
   We do not have an established education and outreach program.

SWMP Element #2 - Public Involvement and Participation

2. Describe public meetings the City holds to solicit input specifically for stormwater related issues.
   We have held a few meetings mainly surrounding the ownership and maintenance of stormwater retention/detention ponds. We also held a meeting regarding the potential installation of a trail/path/berm on SR532 that mostly drew concerns about flood water level in the valley.

3. How does the City currently make the stormwater program documents available to the public, if anything, besides their website?
   The website is our main venue, however we send out informational flyers or mailings on specific issues.

SWMP Element #3 - Illicit Discharge Detection and Elimination

4. Describe the City's existing program for detecting and addressing non-stormwater discharges, spills, illicit connections and illegal dumping.
   It is basically on a reported basis or observation by staff.

5. Does the City report all records of action requests including spill responses and enforcement to the Department of Ecology?
   No. If it is a City generated spill, primarily dealing with our wastewater department, we do but most other issues come to us through our code enforcement.

6. Please describe any additional items we should know about the City's IDDE program.

SWMP Element #4 - Construction Site Runoff from New Redevelopment, and Construction Sites

7. Describe the City's permitting process, including plan review, inspection, and enforcement to ensure compliance with the stormwater runoff control ordinance. What department is responsible for this process?
   Permitting is done through community development. Plan review is done both in-house and through our contracted engineer RH2. Inspections are currently being contracted out through Lawrence's Construction Services. Community development is largely responsible for this process with any run-off or other issues being reported to code enforcement/CD. Public works does review plans and also receives complaints and concerns and makes field observations. Also, PW is very involved with the inspector.

8. Describe the City's inspection program for stormwater facilities in new developments, including BMP installation and maintenance during construction, recordkeeping procedures of inspection reports and enforcement actions.
   Inspections are currently being contracted out through Lawrence's Construction Services. Community development is largely responsible for this process with any run-off or other issues being reported to code enforcement/CD. Public works does review plans and also receives complaints and concerns and makes field observations. Also, PW is very involved with the inspector. Inspection reports are kept at both CD and PW with enforcement actions through code enforcement/CD.

9. Are the "Notice of Intent for Construction Activity" provided during the permit process and/or a central location?
   Not sure of this term or what is being asked? The contractor will show work on their approved plans and schedule work with the inspector. ROW permits will show extent of work and anticipated timing of work. ????

10. Describe the City's private facility maintenance program.
    Currently the City will weed and remove unwanted trees/brush/shrubs at detention/retention ponds. As you know ownership and maintenance of private facilities is being addressed.

11. Describe the training opportunities the City provides to construction operators and City staff on local erosion control BMPs.
    Jeff Foss recently renewed and maintained his CESCL certification. PW employees will need to attend training.

12. Please describe any additional items we should know about the City's Runoff Control program.

SWMP Element #5- Pollution Prevention and Operation and Maintenance for Municipal Operations

13. Does the City have a Municipal Operation and Maintenance (O&M) Plan? If so, when was the O&M Plan last updated?
No plan that I am aware of.

14. How often are inspections of stormwater facilities, catch basins and inlets performed? When was the last time they were inspected?
Structures such as flood/tide gates are inspected at least twice annually. Some other areas are inspected during heavy rains. All catch basins and lines we cleaned and inspected within the last 2 years by an outside contractor.

15. Does the City have any maintenance yards? If so, has a Stormwater Pollution Prevention Plan (SWPPP) been developed for these maintenance yard(s)?
Our public works/maintenance yard does not have a developed SWPPP.

16. What O&M equipment does the City currently own or rent for use? If rented, from what company or agency does the City rent the equipment and how is this paid for? Describe any anticipated significant O&M equipment purchases planned.
We own a sweeper with a vacuum system and a vactor truck. Like previously stated catch basins were cleaned through an outside contract with Cuz Concrete and that work was paid for out of the drainage fund.

17. Describe the O&M training the City provides for employees.
PW employees have been trained on operation of both the sweeper and vactor. Training for detention/retention pond maintenance and BMP's is lacking.

SWMP Element #6 – SWM Program Analysis, Organization, Implementation and Legal Authority

18. Describe any existing and/or proposed interlocal agreements and memorandums of understanding the City has with other agencies.
The City has an ILA with Snohomish County for maintenance work that has primarily dealt with pavement and markings. However, Trevor and I are looking into possible pond maintenance and ditch cleaning.

19. What elements of the stormwater program seem to be working well? What elements have been successfully integrated into the City's "normal" operating procedures?

20. Does the City feel they have adequate legal authority to enforce all aspects of their Stormwater Program, including private facility maintenance.
As all are aware we are working on ownership and maintenance issues relating to ponds.

SWMP Element #7 – Total Maximum Daily Load (TMDL) Allocation

No questions at this time.

SWMP Element #8 – Monitoring

21. Describe any stormwater monitoring that is currently being done by the City, if any.
In conjunction with Sno Co SWM some bacterial testing is being done in Irvine Slough.

SWMP Element #9 – Reporting

22. Describe the system the City uses to track and document stormwater related activities.
Public Works uses IWORQ's work order system.

SWMP Element #10 – Watershed Basin Planning, External Coordination and Services

23. Describe the City's Watershed and/or Basin Planning efforts.
24. Describe policies in place to reduce stormwater runoff, reduce impervious surfaces, and retain native vegetation.
25. Does the City participate in watershed planning (WRIA Planning)?

SWMP Element #12 – Capital Improvement Program

26. Describe the City's existing and long term Stormwater Capital Improvement Program.
27. How is Stormwater CIP Funded? It is not listed as a specific cost to the Stormwater Program in the 2014 Budget.

SWMP Element #14 – Underground Injection Control (UICs) Rule

28. How many infiltration facilities are publicly owned? How many privately owned?
29. Does the City have a risk-based strategy for permitting/approving future stormwater infiltration systems (based on soils, groundwater, drinking water wells, etc)? What are the design standards for locating and constructing infiltration facilities?

Please identify any other stormwater programs, issues, needs, or concerns that you feel should be considered in developing a SWM Program Gap Analysis for the City. Thank you for your assistance.

Attachment #1: Detailed NPDES Phase II Permittee Stormwater Program Questionnaire

SWMP Element #1 - Public Education and Outreach

1. Describe the activities utilized by the City for stormwater education and outreach. Does the City engage in any of the following activities?
   a. Provide water quality educational materials when requested?
      Refer requestor to DOE stormwater manual provide our design standards.
   b. Have a stormwater speakers' bureau?
      No
   c. Broadcast stormwater public service announcements in the media or distribute news releases?
      No
   d. Display stormwater exhibits at community locations?
      No

SWMP Element #2 - Public Involvement and Participation

2. Describe public meetings the City holds to solicit input specifically for stormwater related issues.
   Flyers and information is sent out notifying of time and location; open forum Q&A
3. What are the existing opportunities, if any, for the public to participate in the decision making processes involved in the development and implementation of the Stormwater Program.
   Meetings will be scheduled as part of the comp plan update
4. How does the City currently make the stormwater program documents available to the public, if anything, besides their website?
   Special interest mailings such as with the pond ownership issue
5. Please describe any additional items we should know about the City's public involvement and participation program.

SWMP Element #3 - Illicit Discharge Detection and Elimination

6. How does the City make the storm system map available to interested parties?
   Call or come in and request to view or pay for copies
7. Describe any City ordinances prohibiting illicit discharge on private property or discharge of waste to the public stormwater system.
   I couldn't find any
   a. How is the ordinance enforced? N/A
   b. Where in the municipal code is enforcement addressed?
8. Describe the City's existing program for detecting and addressing non-stormwater discharges, spills, illicit connections and illegal dumping.
   Reporting (either self of complaint) staff observes

9. Describe the City's inspection program for known outfalls or other alternate methods used for identifying unauthorized discharges to the public system.
10. What other entities does the City rely on for spill response assistance?
11. Does the City report all records of action requests including spill responses and enforcement to the Department of Ecology?
12. Describe the City's method of informing public employees, businesses and the general public of hazards associated with illegal discharges and improper waste disposal.
13. Describe the City's procedures for program evaluation and assessment, including tracking number and type of spills identified, inspections made, and feedback from public education efforts.
14. Please describe any additional items we should know about the City's IDDE program.

SWMP Element #4 - Construction Site Runoff from New Redevelopment, and Construction Sites

15. Describe the City's ordinance that addresses new development, redevelopment and/or construction site projects or projects that are part of a planned development.
    SMC Chapter 14 and street and utility standards
16. Describe the City's permitting process, including plan review, inspection, and enforcement to ensure compliance with the stormwater runoff control ordinance. What department is responsible for this process?
    Same as item 7 above
17. Does the City have an ordinance that requires identification of parties responsible for maintenance and inspection of permitted facilities, routine inspection and an enforcement mechanism?
18. Describe the City's inspection program for stormwater facilities in new developments, including BMP installation and maintenance during construction, recordkeeping procedures of inspection reports and enforcement actions.
    Same as item 8 above
19. Are the "Notice of Intent for Construction Activity" provided during the permit process and/or a central location?
20. Describe the training opportunities the City provides to construction operators and City staff on local erosion control BMPs.
21. When did the City provide its most recent training session, and which staff attended?
22. Does the City provide or sponsor training for staff in permitting, plan review, construction site inspection, and enforcement concerning the Stormwater Runoff Control program?
23. Describe the City's review process for site plans prior to construction to ensure compliance with…
    a. the stormwater ordinance
    b. the post-construction runoff ordinance and design manual
24. What percentage of all construction sites that are regulated by the erosion control ordinance are inspected by the City?
25. How does the City pass public complaints related to construction site runoff to field inspectors?
26. Please describe any additional items we should know about the City's Runoff Control program.

SWMP Element #5- Pollution Prevention and Operation and Maintenance for Municipal Operations

27. Does the City have a Municipal Operation and Maintenance (O&M) Plan? If so, when was the O&M Plan last updated?
28. Does the City conduct and document spot checks of known problem areas following what storm? If so, describe the spot checking procedures for stormwater treatment and flow control facilities after major storm events (>10-year recurrence interval).
29. How often are inspections of catch basins and inlets performed? When was the last time they were inspected?

30. Do the O&M practices for road maintenance cover any or all of the following activities relating to streets, parking lots, and roadways (if so, please describe the extent of the activities including frequency):
    a. Pipe and culvert cleaning?
    b. Ditch and roadside areas, including vegetation management?
    c. Street sweeping and cleaning?
    d. Street repair and resurfacing, including pavement grinding?
    e. Pavement striping maintenance?
    f. Snow and ice control?
    g. Utility installation?
    h. Dust control?
31. What standard manual does the City use to provide guidelines for roadway O&M activities?
32. Do the O&M practices for non-road maintenance cover any or all of the following activities relating to parking, open space, right-of-way, and maintenance yards (if so please describe the extent of the activities including frequency):
    a. Application of fertilizer, pesticides, and herbicides, including the development of nutrient management and integrated pest management plans?
    b. Sediment and Erosion control?
    c. Landscape maintenance and vegetation disposal?
    d. Street repair and resurfacing, including pavement grinding?
    e. Trash management?
    f. Building exterior cleaning and maintenance?
33. Describe how O&M practices and frequency are tracked and recorded and the general O&M recordkeeping procedures.
34. Describe the City's ongoing training activities for maintenance and operations, including training on permit requirements, O&M Standards, inspection procedures and selection of appropriate BMPs beyond the ESA Regional Road Maintenance Program.
35. Describe how O&M practices are implemented. Are practices and frequency in accordance with the O&M Plan?
36. Does the City have any maintenance yards? If so, has a Stormwater Pollution Prevention Plan (SWPPP) been developed for these maintenance yard(s)?
37. Describe the City's O&M waste disposal procedure for street sweepings and vactor waste.
38. What O&M equipment does the City currently own or rent for use? If rented, from what company or agency does the City rent the equipment and how is this paid for?
39. Describe any anticipated significant O&M equipment purchases planned.
40. Describe the O&M training the City provides for employees? ESA Regional Road Maintenance Program training?
41. When did the City provide its most recent training session, and which staff attended?

SWMP Element #6 – SWM Program Analysis, Organization, Implementation and Legal Authority

42. Describe any existing and/or proposed interlocal agreements and memorandums of understanding the City has with other agencies.
43. What elements of the stormwater program seem to be working well? What elements have been successfully integrated into the City's "normal" operating procedures?
44. Describe external coordination of services (i.e. out sourcing)
45. Does the City participate in interagency surface water quality strategy coordination? If so, to what extent?
46. Does the City feel they have adequate legal authority to enforce the IDDE ordinance?
47. Does the City feel they have adequate legal authority to enforce development standards, perform inspections during and after construction, and enforce maintenance requirements during construction?
48. Does the City feel they have adequate legal authority to enforce private facility maintenance standards?

49. Does the City feel they have adequate legal regarding right-of-entry to private properties to inspect and maintain storm systems on private property?

SWMP Element #7 – Total Maximum Daily Load (TMDL) Allocation

No questions at this time.

SWMP Element #8 – Monitoring

50. Describe any stormwater monitoring that is currently being done by the City, if any.
51. Has the City identified potential sites for a future, long term monitoring plan?
52. Describe the annual reporting procedures for monitoring of City's SWM Program, if any.
53. Describe the City's efforts to monitor the quality of outfall discharges to impaired waters.
54. Describe the City's participation in any local or regional programs to monitor baseline conditions and evaluate surface water program effectiveness.

SWMP Element #9 – Reporting

55. Are there pollution prevention and management plans for all municipal facilities?
56. Are industrial (stormwater) permit applications submitted as needed?
57. Describe the system the City uses to track, document, and report stormwater related activities.

SWMP Element #10 – Watershed Basin Planning, External Coordination and Services

58. Describe the City's Watershed and/or Basin Planning efforts.
59. Does the City assess stormwater impacts to habitat when making land use decisions?
60. Describe policies in place to reduce stormwater runoff, reduce impervious surfaces, and retain native vegetation.
61. Does the City participate in interagency surface water quality strategy coordination?
62. Has the City adopted a Salmon Recovery Plan?
63. Does the City participate in watershed planning (WRIA Planning)?

SWMP Element #11 – Funding

No questions at this time.

SWMP Element #13 – Capital Improvement Program

64. Describe the City's existing and long term Stormwater Capital Improvement Program.
65. How is Stormwater CIP Funded? It is not listed as a specific cost to the Stormwater Program in the 2014 Budget.

Fee based (rates, connections, investment etc.)

SWMP Element #14 – Underground Injection Control (UICs) Rule

66. How many infiltration facilities are publicly owned? How many privately owned?

Currently no injection systems I am aware of

67. Is the area draining to drywells documented by land use?
68. Does the City have a risk-based strategy for permitting/approving future stormwater infiltration systems (based on soils, groundwater, drinking water wells, etc)? What are the design standards for locating and constructing infiltration facilities?

69. Does the City have an ordinance relating to UICs? What is the ordinance number and where is it located? When was it last updated?
70. How does the City enforce construction standards for infiltration facilities?
71. What annual maintenance do public systems receive after construction is complete?
72. What is the City's pollution prevention plan for public infiltration systems?
73. Has the City identified existing publicly owned infiltration systems in areas of high risk for groundwater degradation?
74. Does the City have a written plan for the management and/or replacement strategy that will reduce pollutant loading to groundwater in high-risk areas? (If so, please provide a copy of the management plan.)
75. If applicable, which of the following elements are included in the replacement strategy: monitoring, effectiveness assessment, report preparation, enhanced O&M, source control, spill control/response, opportunistic retrofits?

Please identify any other stormwater programs, issues, needs, or concerns that you feel should be considered in developing a SWM Program Gap Analysis for the City. Thank you for your assistance.

City of Stanwood Stormwater Comprehensive Plan Survey

What is the Stormwater Comprehensive Plan?
The Stormwater Comprehensive Plan identifies stormwater runoff, drainage basins, flow paths, and system capacities throughout the city's drainage system, and prioritizes a list of needed improvement projects to address current and future needs.

When was the last Stormwater Comprehensive Plan written?
The last stormwater analysis (Drainage Master Plan) was done in 1998 more than 20 years ago. The information is outdated. New information is needed to plan the city's future

How will I be Impacted?
Once residents, business owners and the city council have prioritized the list of needed improvements, the next step is to identify how to fund projects. The city council will evaluate whether current stormwater rates are sufficient to fund future maintenance needs and projects.

Irvine Slough Pump Gates

Purpose of the Survey

The City of Stanwood is developing a Stormwater Comprehensive Plan that includes the development of an updated Stormwater Capital Improvement Program (CIP) Project list. As part of this process, the City Public Works staff would like your input on drainage and stormwater concerns you have seen in the community. All the concerns collected from this survey will be considered for inclusion in the CIP project list.

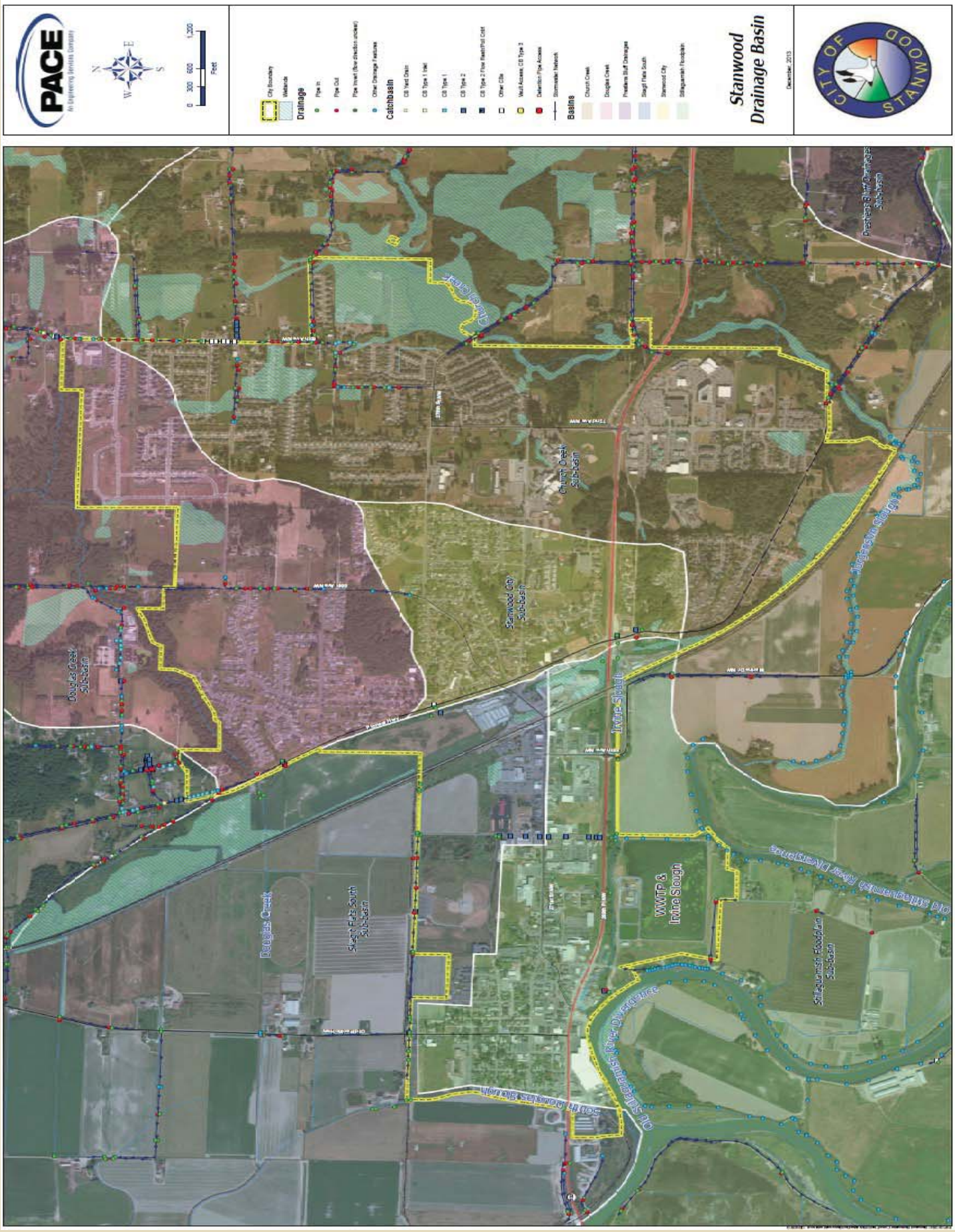
Please fill out the survey located on the reverse side of this flyer or complete the questionnaire on-line at https://www.surveymonkey.com/s/F2DYMGB and help us identify drainage and stormwater concerns. If you have questions about this survey or project please contact Kevin Hushagen, Interim Public Works Director at 360-629-9782 or **kevin@ci.stanwood.wa.us**

What is Stormwater

Storm water (sometimes called Surface Water) is the result of rain and melted snow and ice that runs off surfaces such as rooftops, paved streets, highways and parking lots and other impervious surfaces. As the water runs off these surfaces, it picks up pollutants such as oil, fertilizers, pesticides, trash and animal waste. The water may flow directly into a local stream, wetland, lake or other waterway. Or the water may flow into the storm drain and continue through pipes until it is released untreated into a local waterway. Stanwood's storm drain system feeds into Port Susan and Skagit Bay.

Untreated storm water is generally unsafe because it contains toxic metals, organic compounds, bacteria and viruses. Residential storm water runoff may include pet waste, vehicle fluids such as oil, gas and antifreeze and other hazardous solvents. Industrial storm water runoff may result from chemical spills and washing commercial vehicles and allowing the dirty water to go directly into the storm drain system. Waste from materials and equipment used in construction can wash into the City's storm drain system.

It is a violation of City code to discharge any contaminates into the City's storm drain system or surface/ground water.


PACE
An Engineering Services Company
N
W
E
S
0 300 600 1,200
Feet
City Boundary
Wetlands
Drainage
Pipe In
Pipe Out
Pipe Invert (flow direction arrows)
Other Drainage Features
Catchbasin
CB Yard Drain
CB Type 1 Inlet
CB Type 1
CB Type 2
CB Type 2 Flow Restrictor Cover
Other CBs
Vault Access; CB Type 3
Detention Pipe Access
Stormwater Network
Basins
Church Creek
Douglas Creek
Predaine Bluff Drainages
Skagit Flats South
Stanwood City
Stillaguamish Floodplain
Stanwood
Drainage Basin
December, 2013
CITY OF STANWOOD
Douglas Creek Sub-basin
Skagit Flats South Sub-basin
Douglas Creek
Stanwood City Sub-basin
Church Creek Sub-basin
Glendale Creek
Predaine Bluff Drainages Sub-basin
Irvine Slough
WWTP & Irvine Slough
Stillaguamish Floodplain Sub-basin
Old Stillaguamish River Drainages
South Fork Stillaguamish River
Old Stillaguamish River Drainages

Cut along dashed line and fax, email or mail survey to the City

Please provide assistance by completing the survey below.
Please respond by January 20, 2014

Take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB

Name*: _____

Address*: _____City:_____Zip:_____

Phone Number*: _____ Email*: _____

**This information will be used to follow-up with you if we need additional information*

Is it ok to contact you? Yes _____ No _____

Address/Location of the Drainage/Stormwater Concern: (*If you have a concern at multiple locations, please fill out a separate survey for each location)*
Brief Description of Concern (ex. water flowing onto private property from city street, standing water on roadway, non-functioning storm drainage, etc. Please include copies of photos or a sketch of the drainage/stormwater concern if you have them.):
Type of Drainage/Stormwater Concern: Flooding? Standing Water? Water Quality? Habitat? Stream Erosion? Hillside Erosion?
How often Does this Drainage/Stormwater Concern Occur? Every time it rains? Ongoing? Every Month? Annually? Every Five Years? Other?
How long does the Drainage/Stormwater Concern Last? When did it last occur? How depth was the water? 1-6 hours? 24 hours? Days? 1 inches – 6 inches? 2 ft? 3 ft? _____
Impact (ex. Water over road or sidewalk impacting vehicles or pedestrians, flooding or yards or homes, etc..)
Could this be a safety concern? Yes ____ No ____ If yes, please explain:
Do you have any other drainage/stormwater comments, or concerns?

You can take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB
or return this survey to the City of Stanwood

FAX: 360-629-3009 | SCAN/EMAIL: lisa.noonchester@ci.stanwood.wa.us
HAND DELIVER OR MAIL: City of Stanwood, 10220 270th Street NW, Stanwood, WA 98292

City of Stanwood
10220 270th Street NW
Stanwood, WA 98292

FIRST CLASS MAIL
U.S. POSTAGE PAID
STANWOOD, WA 98292
PERMIT NO. 44

POSTAL PATRON

STANWOOD, WA 98292

Cedarhome Vista Retention Pond

CITY OF STANWOOD
Stormwater Comprehensive Plan Update

Your Help is Need!

The City of Stanwood is developing a Stormwater Comprehensive Plan and we need your input on drainage and stormwater concerns.

Please take a few minutes and take the survey on-line at **https://www.surveymonkey.com/s/F2DYMGB** or you can fill out the enclosed survey, cut off the indicated portion, and return to the city **by January 20, 2014.** via FAX: 360-629-3009, SCAN/EMAIL: lisa.noonchester@ci.stanwood.wa.us HAND DELIVER OR MAIL:
City of Stanwood, 10220 270th Street NW, Stanwood, WA 98292

For More Information Contact
Kevin Hushagen
Interim Public Works Director
360-629-9782
E-mail: Kevin@ci.stanwood.wa.us

Stormwater Comprehensive Plan Update Survey

What is the address/location of the drainage/stormwater concern?

Answer Options	Response Count
	21
answered question	21
skipped question	0

Number	Response Date	Response Text	Categories
1	Jan 22, 2014 10:04 PM	downtown behind Viking Village and alongside the t	
2	Jan 22, 2014 7:08 PM	27616 84th Drive NW	
3	Jan 22, 2014 5:49 PM	27813 80th Ave NW	
4	Jan 21, 2014 4:32 AM	84TH NW just south of 271st	
5	Jan 18, 2014 8:25 AM	7720 stauffer rd	
6	Jan 16, 2014 11:06 PM	7710 Stauffer Rd	
7	Jan 16, 2014 6:38 PM	South end of 86th Dr. just before entering Pioneer H	
8	Jan 16, 2014 5:40 PM	Summerset 278th Place NW	
9	Jan 15, 2014 6:19 AM	27030 102nd Dr NW Stanwood WA 98292	
10	Jan 14, 2014 10:32 PM	See attached photo - 271st St NW to the North, SR9	
11	Jan 14, 2014 7:25 PM	Church Creek Estates Development	
12	Jan 14, 2014 4:05 AM	27327 76th Dr NW	
13	Jan 14, 2014 3:47 AM	9332 271st Street NW	
14	Jan 14, 2014 3:31 AM	72nd Ave	
15	Jan 14, 2014 3:15 AM	At the corner of 81st Dr & 272nd	
16	Jan 13, 2014 11:06 PM	264th street and 95th Ave, just south of the sewer la	
17	Jan 10, 2014 11:06 PM	Marine Drive and 271st at the site of recently demol	
18	Jan 9, 2014 4:41 AM	27126 96th Ave NW	
19	Jan 9, 2014 12:41 AM	Enlarged, improved or upgraded infrastructure to se	
20	Jan 7, 2014 7:49 PM	26920 94TH Drive NW, Stanwood WA. 98292	
21	Jan 7, 2014 5:36 PM	27901 86th Drive NW and the general neighborhoo	

entered 1-22-14

Please provide assistance by completing the survey below.
Please respond by January 20, 2014

Take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB

Name*: Marilyn Stone

Address*: 27016 84th Dr. NW City: Stanwood Zip: 98292-7966

Phone Number*: 360 629 4038 Email*: MARHST@WAVECABLE.COM

This information will be used to follow-up with you if we need additional information

Is it ok to contact you? Yes ✓ No ____

Address/Location of the Drainage/Stormwater Concern: (*If you have a concern at multiple locations, please fill out a separate survey for each location*)
My address (Stanwood City Sub-Basin

Brief Description of Concern (ex. water flowing onto private property from city street, standing water on roadway, non-functioning storm drainage, etc. Please include copies of photos or a sketch of the drainage/stormwater concern if you have them.): water flowing from under city street and under drive way to under garage floor and underground on N. side of house to back yard on North

Type of Drainage/Stormwater Concern: Flooding? Standing Water? Water Quality? Habitat? Stream Erosion? Hillside Erosion?
flooding & some standing water in back.

How often Does this Drainage/Stormwater Concern Occur? Every time it rains? Ongoing? Every Month? Annually? Every Five Years? Other?
Every Time we have heavy rain for 2 days or for a week. average rain

How long does the Drainage/Stormwater Concern Last? When did it last occur? How depth was the water? 1-6 hours? 24 hours? Days? 1 inches – 6 inches? 2 ft? 3 ft? Days / 2 to 4" / as of 1/19/14
Still have some standing water in backyard.

Impact (ex. Water over road or sidewalk impacting vehicles or pedestrians, flooding or yards or homes, etc..)
My interior of house accumulated flood water [illegible] years ago
2 years ago All Seasons waterproofing installed system all around house.

Could this be a safety concern? Yes ✓ No ____ If yes, please explain: under foundation etc. water goes under garage floor to back yard, has cover around a metal pole to keep car from hitting gas furnace.

Do you have any other drainage/stormwater comments, or concerns?
Around is so waterlogged in Spring in backyard on the North side area no one can mow lawn or mud is 5 to 4" deep. By end of June it has dried out some.

You can take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB
or return this survey to the City of Stanwood

FAX: 360-629-3009 | SCAN/EMAIL: lisa.noonchester@ci.stanwood.wa.us
HAND DELIVER OR MAIL: City of Stanwood, 10220 270th Street NW, Stanwood, WA 98292

Cut along dashed line and fax, email or mail survey to the City

entered 1-22-14

Please provide assistance by completing the survey below.
Please respond by January 20, 2014

Take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB

Name*: ROD SUNDBERG

Address*: 27813 80th AVE NW City: STANWOOD Zip: 98292

Phone Number*: 360-629-3632 Email*:

This information will be used to follow-up with you if we need additional information

Is it ok to contact you? Yes X No ____

Address/Location of the Drainage/Stormwater Concern: (*If you have a concern at multiple locations, please fill out a separate survey for each location)*

27813 80th AVE. NW STANWOOD WA 98292

Brief Description of Concern (ex. water flowing onto private property from city street, standing water on roadway, non-functioning storm drainage, etc. Please include copies of photos or a sketch of the drainage/stormwater concern if you have them.):

Non-functioning storm drainage.

Type of Drainage/Stormwater Concern: Flooding? Standing Water? Water Quality? Habitat? Stream Erosion? Hillside Erosion?

standing water

How often Does this Drainage/Stormwater Concern Occur? Every time it rains? Ongoing? Every Month? Annually? Every Five Years? Other?

Other

How long does the Drainage/Stormwater Concern Last? When did it last occur? How depth was the water? 1-6 hours? 24 hours? Days? 1 inches – 6 inches? 2 ft? 3 ft? ____

last year - depth about 1"-2"

Impact (ex. Water over road or sidewalk impacting vehicles or pedestrians, flooding or yards or homes, etc..)

yards & home

Could this be a safety concern? Yes ____ No ____ If yes, please explain:

?

Do you have any other drainage/stormwater comments, or concerns?

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FAX: 360-629-3009 | SCAN/EMAIL: lisa.noonchester@ci.stanwood.wa.us
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entered
bm 1-16

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JAN 15 2014
CITY OF STANWOOD

Please provide assistance by completing the survey below.
Please respond by January 20, 2014

Take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB

Name*: Charles R. (Bob) Hitz

Address*: 27929 - 85TH Dr. NW City: Stanwood Zip: 98292

Phone Number*: 360-631-9539 Email*: bobhitz@wavecable.com

**This information will be used to follow-up with you if we need additional information*

Is it ok to contact you? Yes ✓ No ____

Address/Location of the Drainage/Stormwater Concern: (*If you have a concern at multiple locations, please fill out a separate survey for each location*) South end of 86th Drive just before intering Pioneer Hwy

Brief Description of Concern (ex. water flowing onto private property from city street, standing water on roadway, non-functioning storm drainage, etc. Please include copies of photos or a sketch of the drainage/stormwater concern if you have them.): Water flowing across 86th Drive and down to Pioneer Hwy!

Type of Drainage/Stormwater Concern: Flooding? Standing Water? Water Quality? Habitat? Stream Erosion? Hillside Erosion?

How often Does this Drainage/Stormwater Concern Occur? Every time it rains? Ongoing? Every Month? Annually? Every Five Years? Other?

How long does the Drainage/Stormwater Concern Last? When did it last occur? How depth was the water? 1-6 hours? 24 hours? Days? 1 inches – 6 inches? 2 ft? 3 ft?
It occures during and after ~~the~~ a modrit to light rain

Impact (ex. Water over road or sidewalk impacting vehicles or pedestrians, flooding or yards or homes, etc..)
Impact when it freezes.

Could this be a safety concern? Yes ✓ No ____ If yes, please explain:
when it freezes - it would be difficult to stop when you are going down to Pineer Hwy.

Do you have any other drainage/stormwater comments, or concerns?

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Did not enter to save IP Address
no concern

Please provide assistance by completing the survey below.
Please respond by January 20, 2014

Take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB

Name*: RAMON Cortez

Address*: 27307 83RD AVE NW City: Stanwood, WA Zip: 98292

Phone Number*: 360-224-1740 Email*: XPSRAY@G-MAIL.COM

**This information will be used to follow-up with you if we need additional information*

Is it ok to contact you? Yes ✓ No ____

Address/Location of the Drainage/Stormwater Concern: (*If you have a concern at multiple locations, please fill out a separate survey for each location*) NO CONCERN Stormwater
Brief Description of Concern (ex. water flowing onto private property from city street, standing water on roadway, non-functioning storm drainage, etc. Please include copies of photos or a sketch of the drainage/stormwater concern if you have them.): I HAVE NO CONCERN DRAINAGE
Type of Drainage/Stormwater Concern: Flooding? Standing Water? Water Quality? Habitat? Stream Erosion? Hillside Erosion? NO STANDING WATER
How often Does this Drainage/Stormwater Concern Occur? Every time it rains? Ongoing? Every Month? Annually? Every Five Years? Other? N/A
How long does the Drainage/Stormwater Concern Last? When did it last occur? How depth was the water? 1-6 hours? 24 hours? Days? 1 inches – 6 inches? 2 ft? 3 ft? N/A
Impact (ex. Water over road or sidewalk impacting vehicles or pedestrians, flooding or yards or homes, etc..) MY HOME IS LOCATED IN A DOWN HILL. HAVE NO CONCERN
Could this be a safety concern? Yes ____ No ✓ If yes, please explain:
Do you have any other drainage/stormwater comments, or concerns? NO

You can take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB
or return this survey to the City of Stanwood

FAX: 360-629-3009 | SCAN/EMAIL: lisa.noonchester@ci.stanwood.wa.us
HAND DELIVER OR MAIL: City of Stanwood, 10220 270th Street NW, Stanwood, WA 98292

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1-14-13

Please provide assistance by completing the survey below.
Please respond by January 20, 2014

Take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB

Name*: _____

Address*: _____ City: _____ Zip: _____

Phone Number*: _____ Email*: _____

**This information will be used to follow-up with you if we need additional information*

Is it ok to contact you? Yes _____ No _____

Address/Location of the Drainage/Stormwater Concern: (*If you have a concern at multiple locations, please fill out a separate survey for each location*) Church Creek Estates

Brief Description of Concern (ex. water flowing onto private property from city street, standing water on roadway, non-functioning storm drainage, etc. Please include copies of photos or a sketch of the drainage/stormwater concern if you have them.): When I moved here in 1998, The Sound of frogs at Night was exceptional. They are a great indicator of environmental health. Now I hear of

Type of Drainage/Stormwater Concern: Flooding? Standing Water? Water Quality? Habitat? Stream Erosion? Hillside Erosion? haven't noticed

How often Does this Drainage/Stormwater Concern Occur? Every time it rains? Ongoing? Every Month? Annually? Every Five Years? Other? I had to install sump pump in house. The area is naturally wet. They run (starts up) after every heavy rain

How long does the Drainage/Stormwater Concern Last? When did it last occur? How depth was the water? 1-6 hours? 24 hours? Days? 1 inches – 6 inches? 2 ft? 3 ft? _____

Impact (ex. Water over road or sidewalk impacting vehicles or pedestrians, flooding or yards or homes, etc..) I have never seen any impact at all

Could this be a safety concern? Yes ___ No ___ If yes, please explain: Haven't seen anything at Safety park

Do you have any other drainage/stormwater comments, or concerns? Use environmental friendly. When you spray for weeds (blackberry etc..) you killed alot more environment than intended

You can take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB
or return this survey to the City of Stanwood

FAX: 360-629-3009 | SCAN/EMAIL: lisa.nconchester@ci.stanwood.wa.us
HAND DELIVER OR MAIL: City of Stanwood, 10220 270th Street NW, Stanwood, WA 98292

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1-13-14 JK

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JAN 13 2014
CITY OF STANWOOD

Please provide assistance by completing the survey below.
Please respond by January 20, 2014

Take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB

Name*: Hendrick L. Husby

Address*: 26929-81st Dr NW City: Stanwood, WA Zip: 98292

Phone Number*: 360-939-0300 Email*: N/A

*This information will be used to follow-up with you if we need additional information

Is it ok to contact you? Yes ✓ No ____

Address/Location of the Drainage/Stormwater Concern: (*If you have a concern at multiple locations, please fill out a separate survey for each location*) At the corner of 81st Dr & 272nd

Brief Description of Concern (ex. water flowing onto private property from city street, standing water on roadway, non-functioning storm drainage, etc. Please include copies of photos or a sketch of the drainage/stormwater concern if you have them.): Water accumulates & forms a large puddle because of a lack of proper drainage.

Type of Drainage/Stormwater Concern: Flooding? Standing Water? Water Quality? Habitat? Stream Erosion? Hillside Erosion?
Standing Water

How often Does this Drainage/Stormwater Concern Occur? Every time it rains? Ongoing? Every Month? Annually? Every Five Years? Other?
Every time it rains, Ongoing Puddle

How long does the Drainage/Stormwater Concern Last? When did it last occur? How depth was the water? 1-6 hours? 24 hours? Days? 1 inches – 6 inches? 2 ft? 3 ft? 1/9/14 Ongoing
6 inches deep, 24 hours ongoing.

Impact (ex. Water over road or sidewalk impacting vehicles or pedestrians, flooding or yards or homes, etc..)
Large puddle on the corner of 81st Dr. NW & 272nd

Could this be a safety concern? Yes ____ No ✓ If yes, please explain:

Do you have any other drainage/stormwater comments, or concerns? No

You can take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB
or return this survey to the City of Stanwood

FAX: 360-629-3009 | SCAN/EMAIL: lisa.noonchester@ci.stanwood.wa.us
HAND DELIVER OR MAIL: City of Stanwood, 10220 270th Street NW, Stanwood, WA 98292

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Done 1-13-14

Please provide assistance by completing the survey below.
Please respond by January 20, 2014

Take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB

Name*: WALLACE R. MIDDLETON

Address*: 27312 72 AVE NW City: STANWOOD Zip: 98292-7409

Phone Number*: 629 2946 Email*: —

**This information will be used to follow-up with you if we need additional information*

Is it ok to contact you? Yes ✓ No ____

Address/Location of the Drainage/Stormwater Concern: (*If you have a concern at multiple locations, please fill out a separate survey for each location*)
72 AVE NW

Brief Description of Concern (ex. water flowing onto private property from city street, standing water on roadway, non-functioning storm drainage, etc. Please include copies of photos or a sketch of the drainage/stormwater concern if you have them.):
WATER FLOWS INTO FIELD FROM ROADSIDE DITCH

Type of Drainage/Stormwater Concern: Flooding? Standing Water? Water Quality? Habitat? Stream Erosion? Hillside Erosion?

How often Does this Drainage/Stormwater Concern Occur? Every time it rains? Ongoing? Every Month? Annually? Every Five Years? Other?
WHEN SOIL IS SATURATED AND HEAVY RAINS FALL

How long does the Drainage/Stormwater Concern Last? When did it last occur? How depth was the water? 1-6 hours? 24 hours? Days? 1 inches - 6 inches? 2 ft? 3 ft? IT OCCURED THIS WEEK

Impact (ex. Water over road or sidewalk impacting vehicles or pedestrians, flooding or yards or homes, etc..)

Could this be a safety concern? Yes ____ No ✓ If yes, please explain:

Do you have any other drainage/stormwater comments, or concerns? DRAIN WATER FROM HOUSING HOPE AT 72 & 276th SHOULD HAVE BEEN PIPED OVER TO THE STORM DRAIN ON THE EAST SIDE OF 72 AVE INSTEAD OF INTO THE DITCH ON THE WEST SIDE

You can take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB
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HAND DELIVER OR MAIL: City of Stanwood, 10220 270th Street NW, Stanwood, WA 98292

Cut along dashed line and fax, email or mail survey to the City

1-13-14 JR

Please provide assistance by completing the survey below.
Please respond by January 20, 2014

Take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB

Name*: TERRY GREER (PO BOX 879)

Address*: 9332 271 ST NW City: STANWOOD Zip: 98292

Phone Number*: 360.629.9420 Email*: tgreer@tgi.net

This information will be used to follow-up with you if we need additional information

Is it ok to contact you? Yes X No ____

Address/Location of the Drainage/Stormwater Concern: (*If you have a concern at multiple locations, please fill out a separate survey for each location*)

9332 271st ST NW, 9228 271st. ST. NW

Brief Description of Concern (ex. water flowing onto private property from city street, standing water on roadway, non-functioning storm drainage, etc. Please include copies of photos or a sketch of the drainage/stormwater concern if you have them.): FLOODING ONTO MY PROPERTY FROM STANWOOD TOWNE CENTER NON-FUNCTIONING STORM DRAIN - 9328 271st ST.

Type of Drainage/Stormwater Concern: Flooding? Standing Water? Water Quality? Habitat? Stream Erosion? Hillside Erosion?

FLOODING, STANDING WATER, HEALTH

How often Does this Drainage/Stormwater Concern Occur? Every time it rains? Ongoing? Every Month? Annually? Every Five Years? Other?

ONGOING - DEC. TO APRIL

How long does the Drainage/Stormwater Concern Last? When did it last occur? How depth was the water? 1-6 hours? 24 hours? Days? 1 inches – 6 inches? 2 ft? 3 ft? I INSTALLED A SUMP PUMP ON MY PROPERTY; PRIOR TO THAT I HAD 2 FEET of STANDING WATER.

Impact (ex. Water over road or sidewalk impacting vehicles or pedestrians, flooding or yards or homes, etc..) FLOODING BUILDING FOUNDATIONS, FLOODING PARKING LOT, ROTTING FENCES, BAD SMELL, INFECTIONS FROM WATER.

Could this be a safety concern? Yes ✓ No ____ If yes, please explain: I WOULD PERIODICALLY PUMP WATER VIA PORTABLE SUMP PUMP; I WOULD GET HAND INFECTIONS AFTER EVERY PUMPING EPISODE.

Do you have any other drainage/stormwater comments, or concerns? THE MAIN ISSUE IS A FAILED WATER RETENTION SYSTEM AT STANWOOD TOWNE CENTER: I PUT YELLOW DYE IN THEIR SYSTEM AND MY HAND TURNED YELLOW.

You can take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB
or return this survey to the City of Stanwood

FAX: 360-629-3009 | SCAN/EMAIL: lisa.noonchester@ci.stanwood.wa.us
HAND DELIVER OR MAIL: City of Stanwood, 10220 270th Street NW, Stanwood, WA 98292

Cut along dashed line and fax, email or mail survey to the City

1-13-14 JM

Please provide assistance by completing the survey below.
Please respond by January 20, 2014

Take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB

Name*: Carol E Reed

Address*: 27327 76th Dr. N.W. City: Stanwood, Wa. Zip: 98292

Phone Number*: 360-629-6069 Email*: _____

**This information will be used to follow-up with you if we need additional information*

Is it ok to contact you? Yes _____ No _____

Address/Location of the Drainage/Stormwater Concern: (*If you have a concern at multiple locations, please fill out a separate survey for each location*)

27327 76th Dr. N.W. Stanwood, Wa. 98292

Brief Description of Concern (ex. water flowing onto private property from city street, standing water on roadway, non-functioning storm drainage, etc. Please include copies of photos or a sketch of the drainage/stormwater concern if you have them.): Stanwood highschool drains, not working - baseball - track field. standing water in back yard for last 3 yrs. Drains under house

Type of Drainage/Stormwater Concern: Flooding? Standing Water? Water Quality? Habitat? Stream Erosion? Hillside Erosion?

It drains under my house

How often Does this Drainage/Stormwater Concern Occur? Every time it rains? Ongoing? Every Month? Annually? Every Five Years? Other?

2011 - 2012 - 2013

How long does the Drainage/Stormwater Concern Last? When did it last occur? How depth was the water? 1-6 hours? 24 hours? Days? 1 inches – 6 inches? 2 ft? 3 ft? _____

2013 - 3-4 days - 6 ins maybe more

Impact (ex. Water over road or sidewalk impacting vehicles or pedestrians, flooding or yards or homes, etc..)

5-6 (back yards)

Could this be a safety concern? Yes X No ___ If yes, please explain:

not good for foundation
water under my home can cause black mold

Do you have any other drainage/stormwater comments, or concerns?

You can take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB
or return this survey to the City of Stanwood

FAX: 360-629-3009 | SCAN/EMAIL: lisa.noonchester@ci.stanwood.wa.us
HAND DELIVER OR MAIL: City of Stanwood, 10220 270th Street NW, Stanwood, WA 98292

Cut along dashed line and fax, email or mail survey to the City

entered 1-10-13 LN

Please provide assistance by completing the survey below.
Please respond by January 20, 2014

Take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB

Name*: THAD NELSON

Address*: 7705 273rd St City: STANWOOD Zip: ~~WA~~ 98292

Phone Number*: 360 722 2842 Email*: —

**This information will be used to follow-up with you if we need additional information*

Is it ok to contact you? Yes ✓ No ____

Address/Location of the Drainage/Stormwater Concern: (*If you have a concern at multiple locations, please fill out a separate survey for each location*)
MARINE DRIVE At The Site of Recently Demolishined Feed Store

Brief Description of Concern (ex. water flowing onto private property from city street, standing water on roadway, non-functioning storm drainage, etc. Please include copies of photos or a sketch of the drainage/stormwater concern if you have them.):
RAIN WATER Covers East Side of marine Dr Just ~~East~~ South of 272nd

Type of Drainage/Stormwater Concern: Flooding? Standing Water? Water Quality? Habitat? Stream Erosion? Hillside Erosion?
Standing WATER

How often Does this Drainage/Stormwater Concern Occur? Every time it rains? Ongoing? Every Month? Annually? Every Five Years? Other?
Annually w/ Heavy RAIN

How long does the Drainage/Stormwater Concern Last? When did it last occur? How depth was the water? 1-6 hours? 24 hours? Days? 1 inches – 6 inches? 2 ft? 3 ft? Varies year to year but is a Problem every winter

Impact (ex. Water over road or sidewalk impacting vehicles or pedestrians, flooding or yards or homes, etc..)
WATER over roadway & IN YARDS

Could this be a safety concern? Yes ✓ No ____ If yes, please explain: Cars frequently Drive Around the Standing water, or Hydroplane

Do you have any other drainage/stormwater comments, or concerns?

No

You can take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB
or return this survey to the City of Stanwood

FAX: 360-629-3009 | SCAN/EMAIL: lisa.noonchester@ci.stanwood.wa.us
HAND DELIVER OR MAIL: City of Stanwood, 10220 270th Street NW, Stanwood, WA 98292

Cut along dashed line and fax, email or mail survey to the City

entered 1-14

RECEIVED
JAN 14 2014
CITY OF STANWOOD

Please provide assistance by completing the survey below.
Please respond by January 20, 2014

Take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB

Name*: BILL LENZ

Address*: 29201 LOGEN Rd. City: STANWOOD WA. Zip: 98292

Phone Number*: 360-629-9059 Email*: BLENZ1950@GMAIL.COM

**This information will be used to follow-up with you if we need additional information*

Is it ok to contact you? Yes X No ____

Address/Location of the Drainage/Stormwater Concern: (*If you have a concern at multiple locations, please fill out a separate survey for each location*) PLEASE SEE ATTACHED EXHIBIT #1. FROM 271 ST ST. NW TO THE NORTH, TO SR532 SOUTH. AND FROM 92ND AVE. N.W. TO THE WEST, TO 88TH AVE. N.W. EAST.

Brief Description of Concern (ex. water flowing onto private property from city street, standing water on roadway, non-functioning storm drainage, etc. Please include copies of photos or a sketch of the drainage/stormwater concern if you have them.): SEE ATTACHED EXHIBIT #1 SHOWING APPROXIMATE BOUNDARIES OF THE AREA WITH NO CITY STORM WATER HOOKUP - NON-FUNCTIONING STORM DRAINAGE.

Type of Drainage/Stormwater Concern: Flooding? Standing Water? Water Quality? Habitat? Stream Erosion? Hillside Erosion? FLOODING AND WATER QUALITY

How often Does this Drainage/Stormwater Concern Occur? Every time it rains? Ongoing? Every Month? Annually? Every Five Years? Other? THERE IS NO CITY OF STANWOOD STORM WATER CONNECTION AVAILABLE IN THIS MBII ZONED AREA OF STANWOOD, AND THERE SHOULD BE.

How long does the Drainage/Stormwater Concern Last? When did it last occur? How depth was the water? 1-6 hours? 24 hours? Days? 1 inches – 6 inches? 2 ft? 3 ft? ____

Impact (ex. Water over road or sidewalk impacting vehicles or pedestrians, flooding or yards or homes, etc..) INADEQUIT CITY OF STANWOOD STORM WATER CONVEYANCE CREATING UNNECESSARY NEED FOR RETENTION PONDS. NO HOOKUP AVAILABLE.

Could this be a safety concern? Yes ____ No X If yes, please explain:

Do you have any other drainage/stormwater comments, or concerns? NO

You can take this survey on-line at https://www.surveymonkey.com/s/F2DYMGB
or return this survey to the City of Stanwood

FAX: 360-629-3009 | SCAN/EMAIL: lisa.noonchester@ci.stanwood.wa.us
HAND DELIVER OR MAIL: City of Stanwood, 10220 270th Street NW, Stanwood, WA 98292

Cut along dashed line and fax, email or mail survey to the City

#1

COMPLETE

Collector: Web Link (Web Link)
Started: Tuesday, January 07, 2014 9:23:39 AM
Last Modified: Tuesday, January 07, 2014 9:36:19 AM
Time Spent: 00:12:39
IP Address: 24.113.238.193

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

27901 86th Drive NW and the general neighborhood

Q2: Brief description of concern? Select all that apply.	Water flowing onto private property from city street, Non-functioning storm drainage, Other, Other (please specify) The draining system in this part of town has failed. Homes are being flooded. My property is filled with water every time it rains. Fortunately, my home is not flooded. My property is. Just come and look at the surface drainage on 86th Street and you will see what is happening.
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Flooding, Standing Water, Hillside Erosion, Other (please specify) Erosion is very slow. Fortunately, there has been no sliding. When that happens, if it happens, it should make for some interesting court cases.
Q4: How often does this drainage/stormwater concern occur?	Annually

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/07/2014

Q6: How long does the drainage/stormwater concern last?	Days
Q7: How depth was the water?	1 - 6 inches
Q8: What is the impact of this concern? Select all that apply.	Flooding yards
Q9: Could this be a safety concern?	Yes, If yes, please explain: Trees fall down when the ground is saturated. We have lost several 50 year old trees that blow over when their feet are wet. It is a new and dangerous phenomena. (speeling is not my strong suit) My neighbor's basements have flooded. I have a crawl space. I have installed a sub pump. The crawl space used to be dry, unless the former owner did not tell the truth. That is not the case now. As I said elsewhere, 50 year old trees have died from the excessive water we are experiencing. I would imagine that the value of my property is going down, down, down. Want to buy it?

Q10: Do you have any other drainage/stormwater comments, or concerns?

Tw o homes above me have flooded tw ice from this problem. The entire system has failed and it is no one's fault and apparently no one's concern. We are blessed w ith surface w ater from the entire subdivision. Just look at 86th street during and after rain and you w ill see the problem. It even runs across Pioneer Highw ay.

Thanks for asking.

What w ill be done about it? What can be done about it?

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	John J. Shaffer
Address	2790l 86th Drive N.W. (P. O. Box 1784)
Phone	425-314-5916
Email	Jjsshaffer@aol.com

#2

COMPLETE

Collector: Web Link (Web Link)
Started: Tuesday, January 07, 2014 11:39:42 AM
Last Modified: Tuesday, January 07, 2014 11:49:03 AM
Time Spent: 00:09:21
IP Address: 162.72.190.220

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

26920 94TH Drive NW, Stanwood WA. 98292

Q2: Brief description of concern? Select all that apply.	Water flowing onto private property from city street, Standing water on roadway, Non-functioning storm drainage
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Flooding, Standing Water
Q4: How often does this drainage/stormwater concern occur?	Every Time it Rains

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/07/2014

Q6: How long does the drainage/stormwater concern last?	Days
Q7: How depth was the water?	1 ft
Q8: What is the impact of this concern? Select all that apply.	Water over roadway, Water over sidewalk, Impacting vehicles, Impacting pedestrians, Flooding yards
Q9: Could this be a safety concern?	Yes, If yes, please explain: An elderly (87 y/o) resident lives here. Handicapped assistance is very difficult due to standing water in front of residence. Your attention to this matter is appreciated.

Q10: Do you have any other drainage/stormwater comments, or concerns?

No

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Paul I. Kalmakoff
Address	31310 English Grade Road
Phone	360-629-2085
Email	pik@wildblue.net

#3

COMPLETE

Collector: Web Link (Web Link)
Started: Wednesday, January 08, 2014 4:05:25 PM
Last Modified: Wednesday, January 08, 2014 4:41:21 PM
Time Spent: 00:35:55
IP Address: 24.113.139.150

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

Enlarged, improved or upgraded infrastructure to serve new (or forecast) residential expansion should not be funded by monthly rate increases to existing properties. These charges should be borne entirely by the developers and/or buyers. Building permit collections should go into a trust fund along w ith any mitigation money in order to meet future or pending infrastructure needs.

Q2: Brief description of concern? Select all that apply.	Other, Other (please specify) Cost
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Other (please specify) Cost
Q4: How often does this drainage/stormwater concern occur?	Every Month, Other (please specify) cost

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 12/01/2013

Q6: How long does the drainage/stormwater concern last?	Other, Other (please specify) cost
Q7: How depth was the water?	Other, Other (please specify) checkbook flooded
Q8: What is the impact of this concern? Select all that apply.	Other, Other (please specify) cost
Q9: Could this be a safety concern?	Yes, If yes, please explain: urge to kill

Q10: Do you have any other drainage/stormwater comments, or concerns?

The GMA and/or Comprehensive Plan update(s) should not be used to demand a greater monthly payment from homeow ners residing in neighborhoods that have already paid escalating storm/sew er charges over a period of decades and helped to retire many bonds in favor of the City. I believe the facilities already in place are more than adequate to serve the development base that they w ere designed for almost indefinitely w ith normal maintenance. Unless all of these facilities are suddenly failing and need to be replaced as a result of age/deterioration (rather than the impact of poorly funded grow th) I w ould protest the imposition of additional long-term indebtedness on existing construction to be shared along w ith new development. In effect, it is starting the clock all over again and asking ow ners to pay again for that w hich they have already paid for in the past. In fact, the City has already implemented major increases in storm/sew er charges over the years that in my opinion represent an unw arranted burden on existing homeow ners.

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.	*Respondent skipped this question*

#4

COMPLETE

Collector: Web Link (Web Link)
Started: Wednesday, January 08, 2014 8:32:52 PM
Last Modified: Wednesday, January 08, 2014 8:41:13 PM
Time Spent: 00:08:21
IP Address: 204.195.12.118

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

27126 96th Ave NW

Q2: Brief description of concern? Select all that apply.	Water flowing onto private property from city street, Standing water on roadway, Non-functioning storm drainage
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Flooding, Standing Water, Habitat
Q4: How often does this drainage/stormwater concern occur?	Every Time it Rains, Other (please specify) We have standing water every time it rains, moderate flooding annually, and serious flooding when river is at flood stage

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/08/2014

Q6: How long does the drainage/stormwater concern last?	Days
Q7: How depth was the water?	1 - 6 inches, Other (please specify) Usually 1-6 during normal wet season, 2-3 feet during flood stages
Q8: What is the impact of this concern? Select all that apply.	Water over roadway, Water over sidewalk, Flooding yards
Q9: Could this be a safety concern?	Yes, If yes, please explain: When storm drain fails water is up to 3 feet in street and Library parking lot. It isn't obvious to drivers. It is also a hazard to pedestrians since the storm drain is under water with damaged pavement. It is also a concern with contaminated water.

Q10: Do you have any other drainage/stormwater comments, or concerns?

The issue has increased steadily over the past 10 years and we have not been able to find a viable way to reduce the flooding to our property.

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Andy and Julie Johnson
Address	27126 96th Ave NW
Phone	360-629-3990
Email	andyandjulie@wavecable.com

#5

COMPLETE

Collector: Web Link (Web Link)
Started: Friday, January 10, 2014 2:57:24 PM
Last Modified: Friday, January 10, 2014 3:06:25 PM
Time Spent: 00:09:00
IP Address: 207.183.1.30

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

Marine Drive and 271st at the site of recently demolished Wolfkill Feed store

Q2: Brief description of concern? Select all that apply.	Standing water on roadway, Other (please specify) Rain water covers east side of Marine Dr, south of 272nd
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Standing Water
Q4: How often does this drainage/stormwater concern occur?	Every Time it Rains

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 12/01/2013

Q6: How long does the drainage/stormwater concern last?	Days
Q7: How depth was the water?	1 - 6 inches
Q8: What is the impact of this concern? Select all that apply.	Water over roadway, Flooding yards
Q9: Could this be a safety concern?	Yes, If yes, please explain: Cars frequently drive around the standing water or they hydroplane.

Q10: Do you have any other drainage/stormwater comments, or concerns?

No

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Thad Nelson
Address	7705 273rd Street NW, Stanwood, WA 98292
Phone	360-722-2842

#6

COMPLETE

Collector: Web Link (Web Link)
Started: Monday, January 13, 2014 2:50:54 PM
Last Modified: Monday, January 13, 2014 3:05:38 PM
Time Spent: 00:14:43
IP Address: 50.47.202.210

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

264th street and 95th Ave, just south of the sewer lagoon

Q2: Brief description of concern? Select all that apply.	Water flowing onto private property from city street, Other (please specify) ditches need to be cleaned
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Standing Water
Q4: How often does this drainage/stormwater concern occur?	Ongoing

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/12/2014

Q6: How long does the drainage/stormwater concern last?	Days
Q7: How depth was the water?	1 - 6 inches
Q8: What is the impact of this concern? Select all that apply.	Flooding yards
Q9: Could this be a safety concern?	No

Q10: Do you have any other drainage/stormwater comments, or concerns?

Snohomish County kept these ditches cleaned until they were annexed to the City of Stanwood. They told me they could still do it, but needed an inter-local agreement with the City first. In 2009 I talked to Andy Bullington numerous times regarding this problem, but nothing was ever done. It has been about 20 years since the ditch along 264th st has been cleaned.

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Bobbie Eldridge
Address	26219 95th Ave NW, Stanwood, WA 98292
Phone	360-629-3352
Email	bobbie@eldridges.org

#7

COMPLETE

Collector: Web Link (Web Link)
Started: Monday, January 13, 2014 7:09:53 PM
Last Modified: Monday, January 13, 2014 7:15:00 PM
Time Spent: 00:05:06
IP Address: 24.113.14.115

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

At the corner of 81st Dr & 272nd

Q2: Brief description of concern? Select all that apply.	Standing water on roadway, Non-functioning storm drainage
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Standing Water
Q4: How often does this drainage/stormwater concern occur?	Every Time it Rains

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/09/2014

Q6: How long does the drainage/stormwater concern last?	24 hours
Q7: How depth was the water?	1 - 6 inches
Q8: What is the impact of this concern? Select all that apply.	Water over roadway, Impacting vehicles
Q9: Could this be a safety concern?	No

Q10: Do you have any other drainage/stormwater comments, or concerns?

No

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Hendrick Husby
Address	26929 81st Dr NW
Phone	360-939-0300

#8

COMPLETE

Collector: Web Link (Web Link)
Started: Monday, January 13, 2014 7:25:09 PM
Last Modified: Monday, January 13, 2014 7:30:53 PM
Time Spent: 00:05:44
IP Address: 24.113.14.115

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

72nd Ave

Q2: Brief description of concern? Select all that apply.	Water flowing onto private property from city street
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Standing Water
Q4: How often does this drainage/stormwater concern occur?	Every Time it Rains

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/09/2014

Q6: How long does the drainage/stormwater concern last?	Days
Q7: How depth was the water?	1 - 6 inches
Q8: What is the impact of this concern? Select all that apply.	Flooding yards, Other, Other (please specify) it is flooding the field
Q9: Could this be a safety concern?	No

Q10: Do you have any other drainage/stormwater comments, or concerns?

Drain water from housing hope apts at 72nd & 276th should have been piped over to the storm drain on the east side of 72nd instead of into the ditch on west side

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Wallace Middleton
Address	27312 72nd Ave NW
Phone	360-629-2946

#9

COMPLETE

Collector: Web Link (Web Link)
Started: Monday, January 13, 2014 7:36:39 PM
Last Modified: Monday, January 13, 2014 7:47:09 PM
Time Spent: 00:10:29
IP Address: 24.113.14.115

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

9332 271st Street NW

Q2: Brief description of concern? Select all that apply.	Non-functioning storm drainage, Other, Other (please specify) Flooding from Town Center (QFC) property
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Flooding, Standing Water, Other (please specify) Health
Q4: How often does this drainage/stormwater concern occur?	Ongoing

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/09/2014

Q6: How long does the drainage/stormwater concern last?	Days
Q7: How depth was the water?	2 ft
Q8: What is the impact of this concern? Select all that apply.	Impacting pedestrians, Flooding homes, Other, Other (please specify) Flooding foundation, bad smell, infections from water
Q9: Could this be a safety concern?	Yes, If yes, please explain: Periodically pump water with portable sump pump and would get hand infection after every pumping episode.

Q10: Do you have any other drainage/stormwater comments, or concerns?

The main issue is a failed water retention system at stanwood town center: I put yellow dye in their system and my land turned yellow.

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Terry Greer
Address	PO Box 879, 9332 271st Street NW, Stanwood 98292
Phone	360-629-9420
Email	tgreer@tgi.net

#10

COMPLETE

Collector: Web Link (Web Link)
Started: Monday, January 13, 2014 7:56:03 PM
Last Modified: Monday, January 13, 2014 8:05:21 PM
Time Spent: 00:09:17
IP Address: 24.113.14.115

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

27327 76th Dr NW

Q2: Brief description of concern? Select all that apply.	Non-functioning storm drainage, Other, Other (please specify) water from high school flooding backyards and under house. Bball field & track under water
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Standing Water, Other (please specify) Water drains under my house
Q4: How often does this drainage/stormwater concern occur?	Annually, Other (please specify) been happening annually since 2011
Q5: When was the last time this concern occurred?	*Respondent skipped this question*
Q6: How long does the drainage/stormwater concern last?	Days
Q7: How depth was the water?	1 - 6 inches
Q8: What is the impact of this concern? Select all that apply.	Flooding yards, Other, Other (please specify) floods 5 to 6 backyards
Q9: Could this be a safety concern?	Yes, If yes, please explain: Not good for foundation, water under my house can cause black mold

Q10: Do you have any other drainage/stormwater comments, or concerns?

No

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Carol E. Reed
Address	27327 76th Dr NW
Phone	360-629-6069

#11

COMPLETE

Collector: Web Link (Web Link)
Started: Tuesday, January 14, 2014 11:18:47 AM
Last Modified: Tuesday, January 14, 2014 11:24:59 AM
Time Spent: 00:06:12
IP Address: 207.183.1.30

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

Church Creek Estates Development

Q2: Brief description of concern? Select all that apply.	Other, Other (please specify) 1998 heard lots of frogs, now only silence. Frogs area a good indicator of enviornmental health
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Habitat
Q4: How often does this drainage/stormwater concern occur?	Other, Other (please specify) Have not heard from frogs for several years
Q5: When was the last time this concern occurred?	*Respondent skipped this question*
Q6: How long does the drainage/stormwater concern last?	Other, Other (please specify) the absence of frags has been for years
Q7: How depth was the water?	Other, Other (please specify) n/a
Q8: What is the impact of this concern? Select all that apply.	Other, Other (please specify) impact is to habitats
Q9: Could this be a safety concern?	No

Q10: Do you have any other drainage/stormwater comments, or concerns?

Use enviormental friendly. When spraying for weeds & blackberries. City killed alot more enviornment than intended.

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.	*Respondent skipped this question*

#12

COMPLETE

Collector: Web Link (Web Link)
Started: Tuesday, January 14, 2014 2:25:29 PM
Last Modified: Tuesday, January 14, 2014 2:31:57 PM
Time Spent: 00:06:28
IP Address: 207.183.1.30

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

See attached photo - 271st St NW to the North, SR532 South and from 92nd Ave NW to the West, to 88th Ave NW East.

Q2: Brief description of concern? Select all that apply.	Non-functioning storm drainage, Other (please specify) attached photo shows boundaries of the area w/no city stormwater hookup.
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Flooding, Water Quality
Q4: How often does this drainage/stormwater concern occur?	Other, Other (please specify) There is no city stormwater connection available in this MB11 zoned area and there should be.
Q5: When was the last time this concern occurred?	*Respondent skipped this question*
Q6: How long does the drainage/stormwater concern last?	Other, Other (please specify) n/a
Q7: How depth was the water?	Other, Other (please specify) n/a
Q8: What is the impact of this concern? Select all that apply.	Other, Other (please specify) Inadiquit cit stormwater conveyance creating unnecessary need for retention ponds. No hookup available.
Q9: Could this be a safety concern?	No

Q10: Do you have any other drainage/stormwater comments, or concerns?

No

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Bill Lenz
Address	29201 Logen Rd, Stanwood, WA 98292
Phone	360-629-9059
Email	blenz1950@gmail.com

#13

COMPLETE

Collector: Web Link (Web Link)
Started: Tuesday, January 14, 2014 9:59:33 PM
Last Modified: Tuesday, January 14, 2014 10:19:23 PM
Time Spent: 00:19:50
IP Address: 50.47.223.96

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

27030 102nd Dr NW Stanwood WA 98292

Q2: Brief description of concern? Select all that apply.	Other, Other (please specify) Yard floods during heavy rains
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Flooding, Standing Water
Q4: How often does this drainage/stormwater concern occur?	Other, Other (please specify) During heavy rains

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/13/2014

Q6: How long does the drainage/stormwater concern last?	Days
Q7: How depth was the water?	Other, Other (please specify) 1-12 inches, depending upon the rain
Q8: What is the impact of this concern? Select all that apply.	Flooding yards, Other, Other (please specify) Blocks both entrances to house
Q9: Could this be a safety concern?	No

Q10: Do you have any other drainage/stormwater comments, or concerns?

Our yard is a low spot in the neighborhood. Property has storm drain, but it is on the high side near street, so only during extensive flooding does the water drain out.

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	James Coleman
Address	27030 102nd Dr NW
Phone	3606296058
Email	jamesbcoleman@hotmail.com

#14

COMPLETE

Collector: Web Link (Web Link)
Started: Thursday, January 16, 2014 7:27:21 AM
Last Modified: Thursday, January 16, 2014 9:39:37 AM
Time Spent: 02:12:16
IP Address: 138.163.106.73

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

Summerset
278th Place NW

Q2: Brief description of concern? Select all that apply.	Other, Other (please specify) City Water Tower property debris runs off onto roadway and into storm system and drainage pond (pond is owned by home owners)
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Water Quality, Habitat, Hillside Erosion, Other (please specify) City Property runoff debris uneccessarily puts debris in privately owned storm pond and creates additional maintenance and cost burdens on homeowners.
Q4: How often does this drainage/stormwater concern occur?	Ongoing, Other (please specify) When it rains AND when city trucks (more than once a day) go to the water tower project - trucks bring debris from gravel/dirt road onto roadway. This debris gets in storm system.

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/16/2014

Q6: How long does the drainage/stormwater concern last?	Other, Other (please specify) ongoing.
Q7: How depth was the water?	Other, Other (please specify) Debris based on rain and amount of vehicle traffic at the city water tower.
Q8: What is the impact of this concern? Select all that apply.	Other, Other (please specify) The drainage pond is privately owned and maintained. The debris from the city property AND the runoff should not go to the storm system on 278th PL NW since it goes to the privately owned pond. This debris decreases the life of the pond and will require residents to pay for servicing the pond and more frequent intervals.
Q9: Could this be a safety concern?	No

Q10: Do you have any other drainage/stormwater comments, or concerns?

The City should take over maintenance and ownership of ALL drainage ponds in the city limits. This will ensure uniformity and proper maintenance. Stormwater ponds are the weak link in the system- privately maintained by novice homeowners. Modest fees to defer the cost of the maintenance of the pond could be incorporated into existing drainage fees. Housing Developments bring revenue to local business and strengthen the local economy. Support the Stanwood residents and take over the drainage ponds.

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Anthony Hardenbrook
Address	7715 278th Place NW
Phone	3609133087

#15

COMPLETE

Collector: Web Link (Web Link)
Started: Thursday, January 16, 2014 10:31:52 AM
Last Modified: Thursday, January 16, 2014 10:38:14 AM
Time Spent: 00:06:22
IP Address: 207.183.1.30

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

South end of 86th Dr. just before entering Pioneer Hwy

Q2: Brief description of concern? Select all that apply.	Other, Other (please specify) Water flowing accross 86th Dr. and down to Pioneer Hwy.
Q3: Your drainage/stormwater concern is what type? Select all that apply.	*Respondent skipped this question*
Q4: How often does this drainage/stormwater concern occur?	Every Time it Rains
Q5: When was the last time this concern occurred?	*Respondent skipped this question*
Q6: How long does the drainage/stormwater concern last?	Other, Other (please specify) It occurs durning and after a moderate to light rain
Q7: How depth was the water?	Other, Other (please specify) Flowing
Q8: What is the impact of this concern? Select all that apply.	Water over roadway, Impacting vehicles, Impacting pedestrians, Other, Other (please specify) Impact when it freezes
Q9: Could this be a safety concern?	Yes, If yes, please explain: When it freezes it would be difficult to stop when you are going down to Pioneer Hwy.
Q10: Do you have any other drainage/stormwater comments, or concerns?	*Respondent skipped this question*

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Charles R. (Bob) Hitz
Address	27929 85th Dr. NW
Phone	360-631-9539
Email	bobhitz@wavecable.com

#16

COMPLETE

Collector: Web Link (Web Link)
Started: Thursday, January 16, 2014 2:59:36 PM
Last Modified: Thursday, January 16, 2014 3:06:00 PM
Time Spent: 00:06:23
IP Address: 207.183.1.30

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

7710 Stauffer Rd

Q2: Brief description of concern? Select all that apply.	Water flowing onto private property from city street
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Flooding
Q4: How often does this drainage/stormwater concern occur?	Every Time it Rains

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/09/2014

Q6: How long does the drainage/stormwater concern last?	1-6 hours
Q7: How depth was the water?	1 - 6 inches
Q8: What is the impact of this concern? Select all that apply.	Flooding yards, Flooding homes, Other (please specify) I live 1/2 down the hill, the water runs under my house to get to the bottom of the hill.
Q9: Could this be a safety concern?	No

Q10: Do you have any other drainage/stormwater comments, or concerns?

The holding pond by my house is a breeding ground for mossquitos.

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Helene Watkins
Address	7710 Stauffer Rd
Phone	425-422-9288
Email	hmwatkins1@yahoo.com

#17

COMPLETE

Collector: Web Link (Web Link)
Started: Saturday, January 18, 2014 12:21:45 AM
Last Modified: Saturday, January 18, 2014 12:25:24 AM
Time Spent: 00:03:38
IP Address: 204.195.11.174

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

7720 stauffer rd

Q2: Brief description of concern? Select all that apply.	Water flowing onto private property from city street, Standing water on roadway, Other, Other (please specify) NO storm drainage
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Flooding, Standing Water, Hillside Erosion, Other (please specify) Nearly flooded my garage in last storm.
Q4: How often does this drainage/stormwater concern occur?	Every Time it Rains, Other (please specify) Near flooding not as much

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/13/2014

Q6: How long does the drainage/stormwater concern last?	Other, Other (please specify) How ever long the rains last
Q7: How depth was the water?	1 - 6 inches
Q8: What is the impact of this concern? Select all that apply.	Water over roadway, Flooding yards
Q9: Could this be a safety concern?	No
Q10: Do you have any other drainage/stormwater comments, or concerns?	*Respondent skipped this question*

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Doug chandler
Address	7$20 stauffer rd
Phone	3606291715
Email	dougpc1@uw.edu

#18

COMPLETE

Collector: Web Link (Web Link)
Started: Monday, January 20, 2014 8:27:13 PM
Last Modified: Monday, January 20, 2014 8:32:16 PM
Time Spent: 00:05:03
IP Address: 50.47.73.119

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

84TH NW just south of 271st

Q2: Brief description of concern? Select all that apply.	Standing water on roadway
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Flooding, Standing Water
Q4: How often does this drainage/stormwater concern occur?	Every Time it Rains
Q5: When was the last time this concern occurred?	

Please enter date of last occurrence. 01/08/2014

Q6: How long does the drainage/stormwater concern last?	Days
Q7: How depth was the water?	1 - 6 inches
Q8: What is the impact of this concern? Select all that apply.	Water over roadway, Impacting vehicles
Q9: Could this be a safety concern?	Yes, If yes, please explain: Swerving to miss the water - splashing on windshields obscuring vision - brakes
Q10: Do you have any other drainage/stormwater comments, or concerns?	*Respondent skipped this question*

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Ralph H. Nichols
Email	ralphhnichols@frontier.com

#19

COMPLETE

Collector: Web Link (Web Link)
Started: Wednesday, January 22, 2014 9:42:58 AM
Last Modified: Wednesday, January 22, 2014 9:48:41 AM
Time Spent: 00:05:42
IP Address: 207.183.1.30

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

27813 80th Ave NW

Q2: Brief description of concern? Select all that apply.	Non-functioning storm drainage
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Standing Water
Q4: How often does this drainage/stormwater concern occur?	Annually

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/15/2013

Q6: How long does the drainage/stormwater concern last?	Other
Q7: How depth was the water?	1 - 6 inches
Q8: What is the impact of this concern? Select all that apply.	Flooding yards, Flooding homes
Q9: Could this be a safety concern?	No

Q10: Do you have any other drainage/stormwater comments, or concerns?

None

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Rod Sundberg
Address	27813 80th Ave NW, Stanwood, WA 98292
Phone	360-629-3632

#20

COMPLETE

Collector: Web Link (Web Link)
Started: Wednesday, January 22, 2014 10:59:28 AM
Last Modified: Wednesday, January 22, 2014 11:08:25 AM
Time Spent: 00:08:56
IP Address: 207.183.1.30

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

27616 84th Drive NW

Q2: Brief description of concern? Select all that apply.	Water flowing onto private property from city street
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Flooding, Standing Water
Q4: How often does this drainage/stormwater concern occur?	Every Time it Rains

Q5: When was the last time this concern occurred?

Please enter date of last occurrence. 01/09/2014

Q6: How long does the drainage/stormwater concern last?	Days
Q7: How depth was the water?	Other, Other (please specify) Rained on 1/9 as of 1/14 there is 2 to 4 inches of standing water in back yard
Q8: What is the impact of this concern? Select all that apply.	Flooding yards, Flooding homes
Q9: Could this be a safety concern?	Yes, If yes, please explain: water goes under garage floor to backyard, has come up around a metal pole to keep car from hitting gas furnace.

Q10: Do you have any other drainage/stormwater comments, or concerns?

Ground is so waterlogged in spring in backyard on the north side area no one can mow lawn, mud is 4" to 5" deep. By the end of June it has dried out some.

Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.

Name	Marilyn Stone
Address	27616 84th Dr NW, Stanwood, WA 98292
Phone	360-629-4038
Email	marhsto@wavecable.com

#21

COMPLETE

Collector: Web Link (Web Link)
Started: Wednesday, January 22, 2014 2:01:39 PM
Last Modified: Wednesday, January 22, 2014 2:04:00 PM
Time Spent: 00:02:20
IP Address: 204.195.13.89

PAGE 1

Q1: What is the address/location of the drainage/stormwater concern?

downtown behind Viking Village and alongside the tracks across the tracks from Wolf Kill and by Herbs Diner

Q2: Brief description of concern? Select all that apply.	Standing water on roadway, Non-functioning storm drainage
Q3: Your drainage/stormwater concern is what type? Select all that apply.	Flooding, Standing Water
Q4: How often does this drainage/stormwater concern occur?	Ongoing
Q5: When was the last time this concern occurred?	*Respondent skipped this question*
Q6: How long does the drainage/stormwater concern last?	Days
Q7: How depth was the water?	1 - 6 inches
Q8: What is the impact of this concern? Select all that apply.	Water over roadway, Water over sidewalk, Impacting vehicles, Impacting pedestrians
Q9: Could this be a safety concern?	Yes
Q10: Do you have any other drainage/stormwater comments, or concerns?	*Respondent skipped this question*
Q11: Optional: Personal information will only be used if the city needs to contact you regarding your concern.	*Respondent skipped this question*

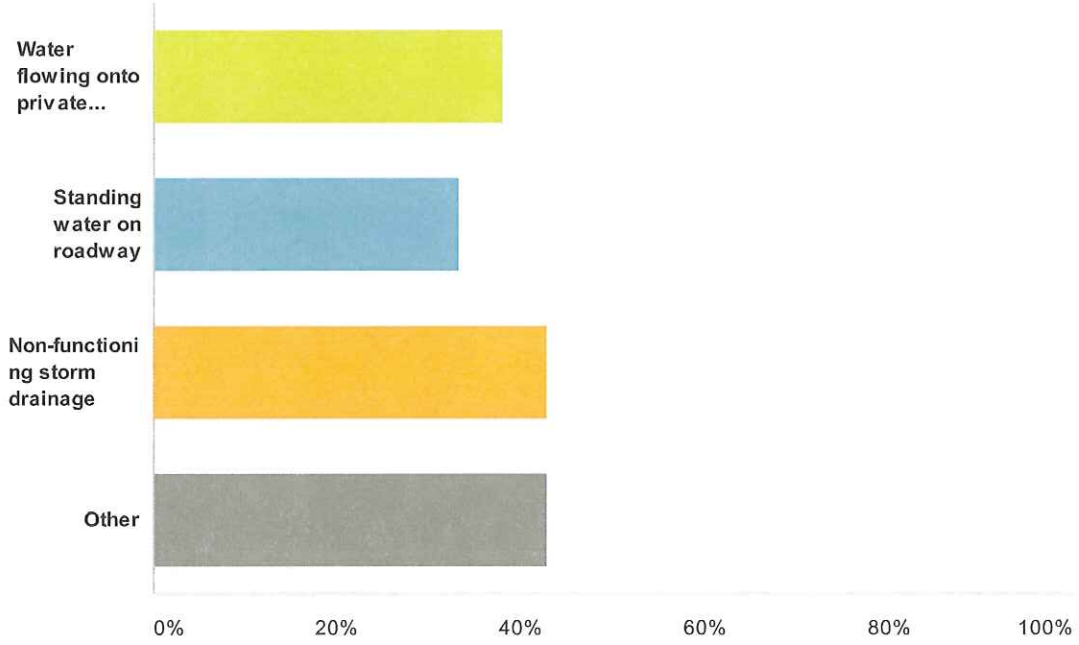
Q1 What is the address/location of the drainage/stormwater concern?

Answered: 21 Skipped: 0

#	Responses	Date
1	downtown behind Viking Village and alongside the tracks across the tracks from Wolf Kill and by Herbs Diner	1/22/2014 2:04 PM
2	27616 84th Drive NW	1/22/2014 11:08 AM
3	27813 80th Ave NW	1/22/2014 9:49 AM
4	84TH NW just south of 271st	1/20/2014 8:32 PM
5	7720 stauffer rd	1/18/2014 12:25 AM
6	7710 Stauffer Rd	1/16/2014 3:06 PM
7	South end of 86th Dr. just before entering Pioneer Hwy	1/16/2014 10:38 AM
8	Summerset 278th Place NW	1/16/2014 9:40 AM
9	27030 102nd Dr NW Stanwood WA 98292	1/14/2014 10:19 PM
10	See attached photo - 271st St NW to the North, SR532 South and from 92nd Ave NW to the West, to 88th Ave NW East.	1/14/2014 2:32 PM
11	Church Creek Estates Development	1/14/2014 11:25 AM
12	27327 76th Dr NW	1/13/2014 8:05 PM
13	9332 271st Street NW	1/13/2014 7:47 PM
14	72nd Ave	1/13/2014 7:31 PM
15	At the corner of 81st Dr & 272nd	1/13/2014 7:15 PM
16	264th street and 95th Ave, just south of the sewer lagoon	1/13/2014 3:06 PM
17	Marine Drive and 271st at the site of recently demolished Wolfkill Feed store	1/10/2014 3:06 PM
18	27126 96th Ave NW	1/8/2014 8:41 PM
19	Enlarged, improved or upgraded infrastructure to serve new (or forecast) residential expansion should not be funded by monthly rate increases to existing properties. These charges should be borne entirely by the developers and/or buyers. Building permit collections should go into a trust fund along with any mitigation money in order to meet future or pending infrastructure needs.	1/8/2014 4:41 PM
20	26920 94TH Drive NW, Stanwood WA. 98292	1/7/2014 11:49 AM
21	27901 86th Drive NW and the general neighborhood	1/7/2014 9:36 AM

Q2 Brief description of concern? Select all that apply.

Answered: 21 Skipped: 0



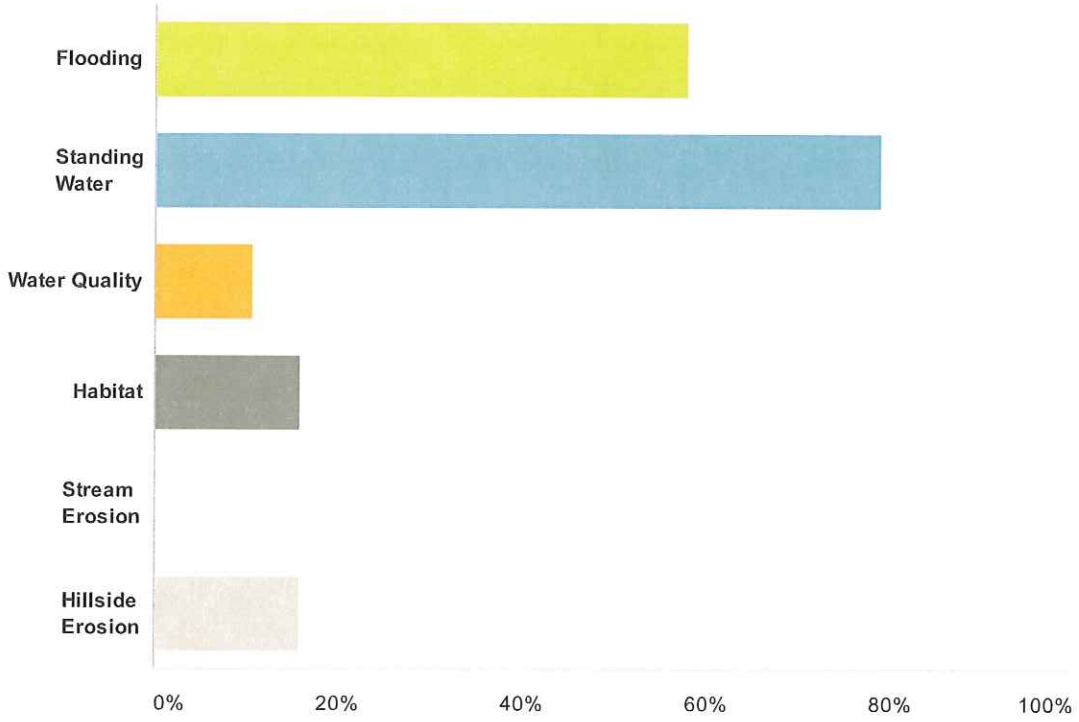
Answer Choices	Responses	
Water flowing onto private property from city street	**38.10%**	8
Standing water on roadway	**33.33%**	7
Non-functioning storm drainage	**42.86%**	9
Other	**42.86%**	9
Total Respondents: 21		

#	Other (please specify)	Date
1	NO storm drainage	1/18/2014 12:25 AM
2	Water flowing accross 86th Dr. and down to Pioneer Hwy.	1/16/2014 10:38 AM
3	City Water Tower property debris runs off onto roadway and into storm system and drainage pond (pond is owned by home owners)	1/16/2014 9:40 AM
4	Yard floods during heavy rains	1/14/2014 10:19 PM
5	attached photo shows boundaries of the area w/no city stormwater hookup.	1/14/2014 2:32 PM
6	1998 heard lots of frogs, now only silence. Frogs area a good indicator of enviommental health	1/14/2014 11:25 AM
7	water from high school flooding backyards and under house. Bball field & track under water	1/13/2014 8:05 PM
8	Flooding from Town Center (QFC) property	1/13/2014 7:47 PM
9	ditches need to be cleaned	1/13/2014 3:06 PM
10	Rain water covers east side of Marine Dr, south of 272nd	1/10/2014 3:06 PM
11	Cost	1/8/2014 4:41 PM

12	The draining system in this part of town has failed. Homes are being flooded. My property is filled with water every time it rains. Fortunately, my home is not flooded. My property is. Just come and look at the surface drainage on 86th Street and you will see what is happening.	1/7/2014 9:36 AM

Q3 Your drainage/stormwater concern is what type? Select all that apply.

Answered: 19 Skipped: 2

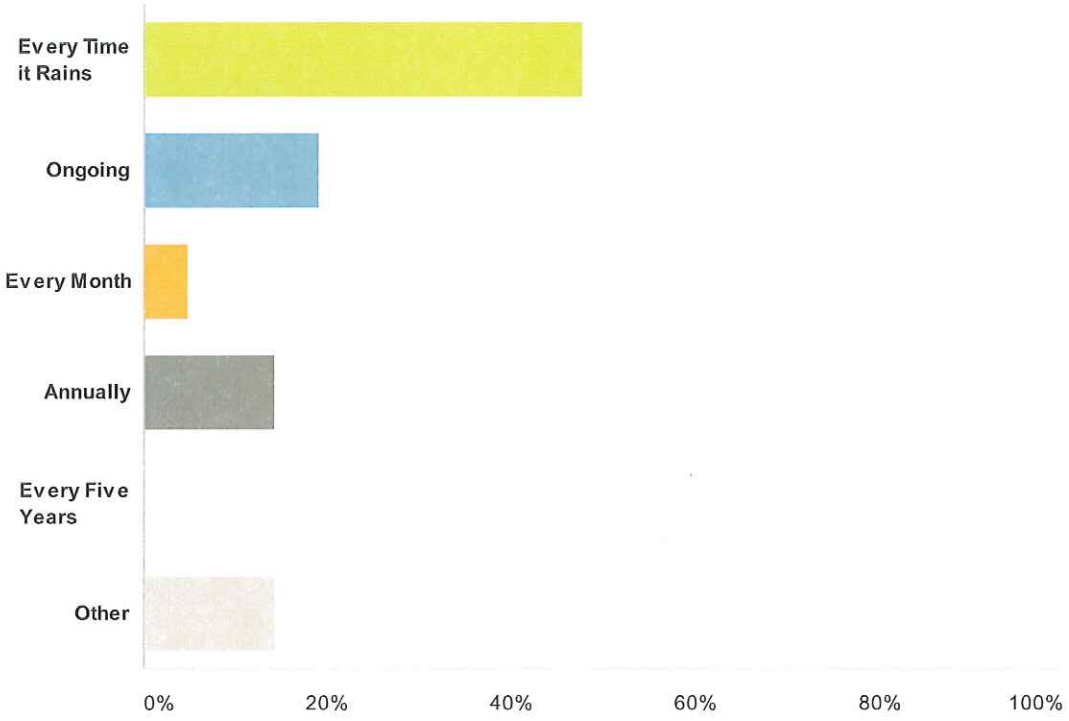


Answer Choices	Responses	
Flooding	57.89%	11
Standing Water	78.95%	15
Water Quality	10.53%	2
Habitat	15.79%	3
Stream Erosion	0%	0
Hillside Erosion	15.79%	3
Total Respondents: 19		

#	Other (please specify)	Date
1	Nearly flooded my garage in last storm.	1/18/2014 12:25 AM
2	City Property runoff debris uneccessarily puts debris in privately owned storm pond and creates additional maintenance and cost burdens on homeowners.	1/16/2014 9:40 AM
3	Water drains under my house	1/13/2014 8:05 PM
4	Health	1/13/2014 7:47 PM
5	Cost	1/8/2014 4:41 PM
6	Erosion is very slow. Fortunately, there has been no sliding. When that happens, if it happens, it should make for some interesting court cases.	1/7/2014 9:36 AM

Q4 How often does this drainage/stormwater concern occur?

Answered: 21 Skipped: 0



Answer Choices	Responses	
Every Time it Rains	**47.62%**	10
Ongoing	**19.05%**	4
Every Month	**4.76%**	1
Annually	**14.29%**	3
Every Five Years	**0%**	0
Other	**14.29%**	3
Total		**21**

#	Other (please specify)	Date
1	Near flooding not as much	1/18/2014 12:25 AM
2	When it rains AND when city trucks (more than once a day) go to the water tower project - trucks bring debris from gravel/dirt road onto roadway. This debris gets in storm system.	1/16/2014 9:40 AM
3	During heavy rains	1/14/2014 10:19 PM
4	There is no city stormwater connection available in this MB11 zoned area and there should be.	1/14/2014 2:32 PM
5	Have not heard from frogs for several years	1/14/2014 11:25 AM
6	been happening annually since 2011	1/13/2014 8:05 PM
7	We have standing water every time it rains, moderate flooding annually, and serious flooding when river is at flood stage	1/8/2014 8:41 PM

8	cost	1/8/2014 4:41 PM

Q5 When was the last time this concern occurred?

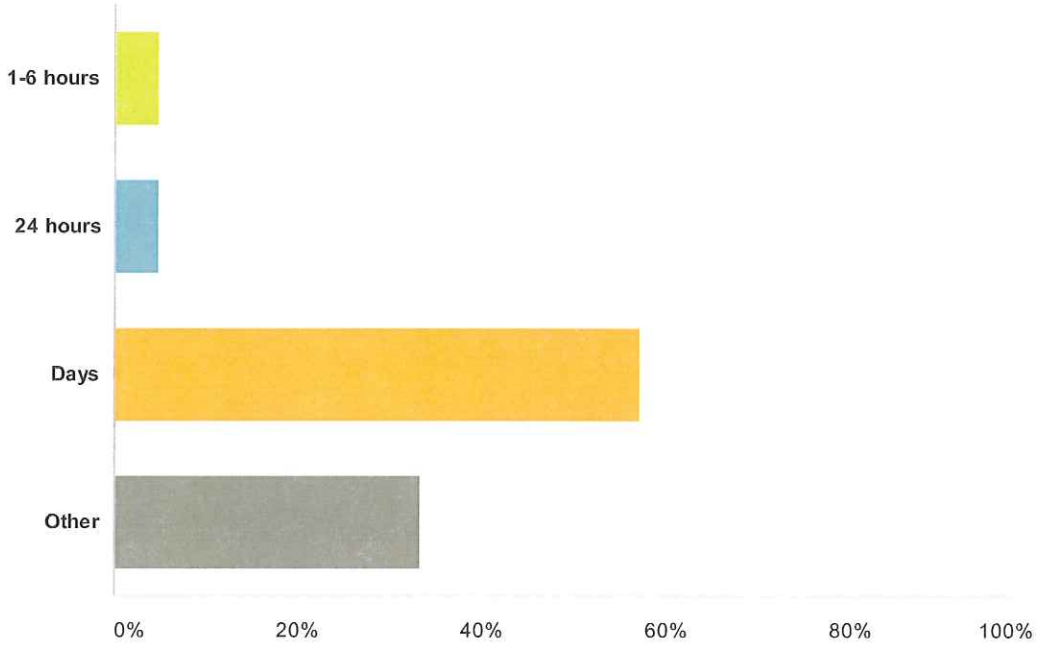
Answered: 16 Skipped: 5

Answer Choices	Responses	
Please enter date of last occurrence.	100%	16

#	Please enter date of last occurrence.	Date
1	01/09/2014	1/22/2014 11:08 AM
2	01/15/2013	1/22/2014 9:49 AM
3	01/08/2014	1/20/2014 8:32 PM
4	01/13/2014	1/18/2014 12:25 AM
5	01/09/2014	1/16/2014 3:06 PM
6	01/16/2014	1/16/2014 9:40 AM
7	01/13/2014	1/14/2014 10:19 PM
8	01/09/2014	1/13/2014 7:47 PM
9	01/09/2014	1/13/2014 7:31 PM
10	01/09/2014	1/13/2014 7:15 PM
11	01/12/2014	1/13/2014 3:06 PM
12	12/01/2013	1/10/2014 3:06 PM
13	01/08/2014	1/8/2014 8:41 PM
14	12/01/2013	1/8/2014 4:41 PM
15	01/07/2014	1/7/2014 11:49 AM
16	01/07/2014	1/7/2014 9:36 AM

Q6 How long does the drainage/stormwater concern last?

Answered: 21 Skipped: 0

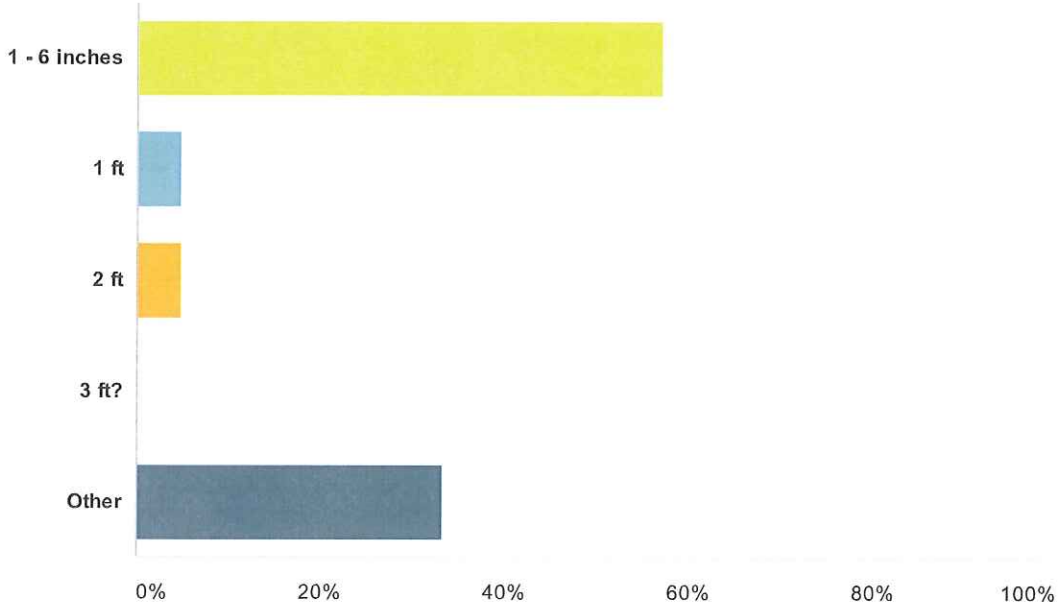


Answer Choices	Responses	
1-6 hours	**4.76%**	1
24 hours	**4.76%**	1
Days	**57.14%**	12
Other	**33.33%**	7
Total		**21**

#	Other (please specify)	Date
1	However long the rains last	1/18/2014 12:25 AM
2	It occurs during and after a moderate to light rain	1/16/2014 10:38 AM
3	ongoing.	1/16/2014 9:40 AM
4	n/a	1/14/2014 2:32 PM
5	the absence of frags has been for years	1/14/2014 11:25 AM
6	cost	1/8/2014 4:41 PM

Q7 How depth was the water?

Answered: 21 Skipped: 0

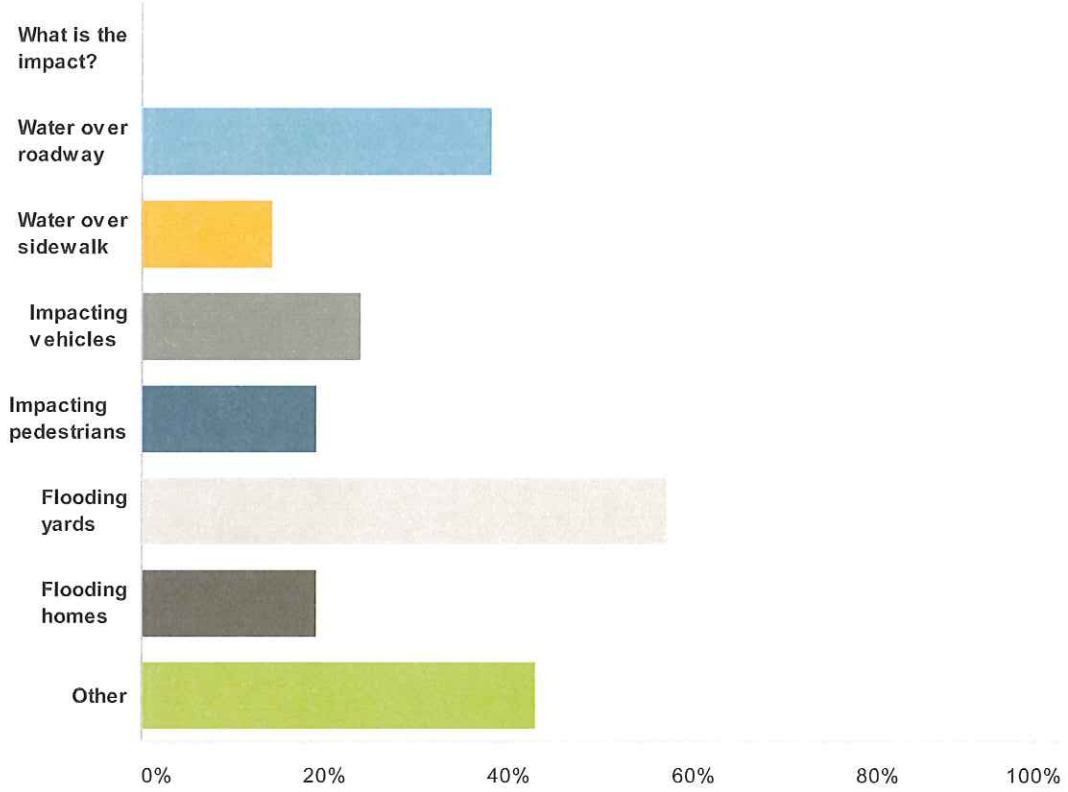


Answer Choices	Responses	
1 - 6 inches	**57.14%**	12
1 ft	**4.76%**	1
2 ft	**4.76%**	1
3 ft?	**0%**	0
Other	**33.33%**	7
Total		**21**

#	Other (please specify)	Date
1	Rained on 1/9 as of 1/14 there is 2 to 4 inches of standing water in back yard	1/22/2014 11:08 AM
2	Flowing	1/16/2014 10:38 AM
3	Debris based on rain and amount of vehicle traffic at the city water tower.	1/16/2014 9:40 AM
4	1-12 inches, depending upon the rain	1/14/2014 10:19 PM
5	n/a	1/14/2014 2:32 PM
6	n/a	1/14/2014 11:25 AM
7	Usually 1-6 during normal wet season, 2-3 feet during flood stages	1/8/2014 8:41 PM
8	checkbook flooded	1/8/2014 4:41 PM

Q8 What is the impact of this concern? Select all that apply.

Answered: 21 Skipped: 0



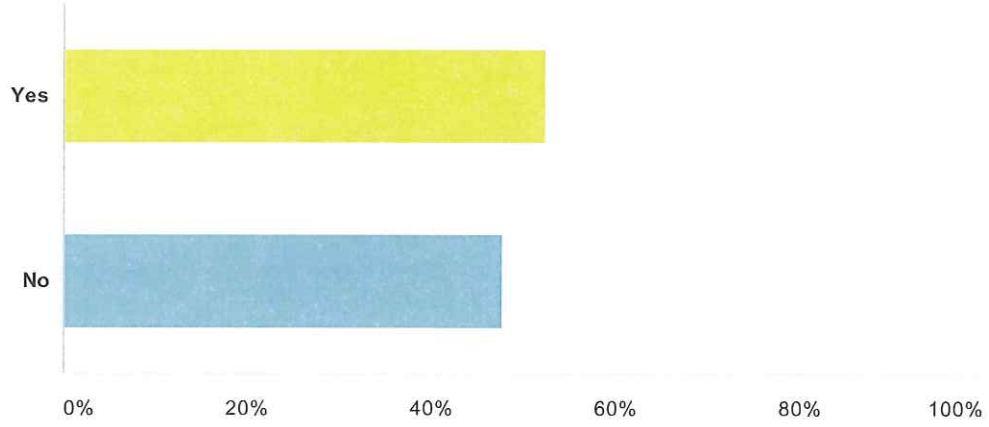
Answer Choices	Responses	
What is the impact?	**0%**	0
Water over roadway	**38.10%**	8
Water over sidewalk	**14.29%**	3
Impacting vehicles	**23.81%**	5
Impacting pedestrians	**19.05%**	4
Flooding yards	**57.14%**	12
Flooding homes	**19.05%**	4
Other	**42.86%**	9
Total Respondents: 21		

#	Other (please specify)	Date
1	I live 1/2 down the hill, the water runs under my house to get to the bottom of the hill.	1/16/2014 3:06 PM
2	Impact when it freezes	1/16/2014 10:38 AM

3	The drainage pond is privately owned and maintained. The debris from the city property AND the runoff should not go to the storm system on 278th PL NW since it goes to the privately owned pond. This debris decreases the life of the pond and will require residents to pay for servicing the pond and more frequent intervals.	1/16/2014 9:40 AM
4	Blocks both entrances to house	1/14/2014 10:19 PM
5	Inadiquit cit stormwater conveyance creating unnecessary need for retention ponds. No hookup available.	1/14/2014 2:32 PM
6	impact is to habitats	1/14/2014 11:25 AM
7	floods 5 to 6 backyards	1/13/2014 8:05 PM
8	Flooding foundation, bad smell, infections from water	1/13/2014 7:47 PM
9	it is flooding the field	1/13/2014 7:31 PM
10	cost	1/8/2014 4:41 PM

Q9 Could this be a safety concern?

Answered: 21 Skipped: 0



Answer Choices	Responses	
Yes	**52.38%**	11
No	**47.62%**	10
Total		**21**

#	If yes, please explain:	Date
1	water goes under garage floor to backyard, has come up around a metal pole to keep car from hitting gas furnace.	1/22/2014 11:08 AM
2	Swerving to miss the water - splashing on windshields obscuring vision - brakes	1/20/2014 8:32 PM
3	When it freezes it would be difficult to stop when you are going down to Pioneer Hwy.	1/16/2014 10:38 AM
4	Not good for foundation, water under my house can cause black mold	1/13/2014 8:05 PM
5	Periodically pump water with portable sump pump and would get hand infection after every pumping episode.	1/13/2014 7:47 PM
6	Cars frequently drive around the standing water or they hydroplane.	1/10/2014 3:06 PM
7	When storm drain fails water is up to 3 feet in street and Library parking lot. It isn't obvious to drivers. It is also a hazard to pedestrians since the storm drain is under water with damaged pavement. It is also a concern with contaminated water.	1/8/2014 8:41 PM
8	urge to kill	1/8/2014 4:41 PM
9	An elderly (87 y/o) resident lives here. Handicapped assistance is very difficult due to standing water in front of residence. Your attention to this matter is appreciated.	1/7/2014 11:49 AM
10	Trees fall down when the ground is saturated. We have lost several 50 year old trees that blow over when their feet are wet. It is a new and dangerous phenomena. (speeling is not my strong suit) My neighbor's basements have flooded. I have a crawl space. I have installed a sub pump. The crawl space used to be dry, unless the former owner did not tell the truth. That is not the case now. As I said elsewhere, 50 year old trees have died from the excessive water we are experiencing. I would imagine that the value of my property is going down, down, down. Want to buy it?	1/7/2014 9:36 AM

Q10 Do you have any other drainage/stormwater comments, or concerns?

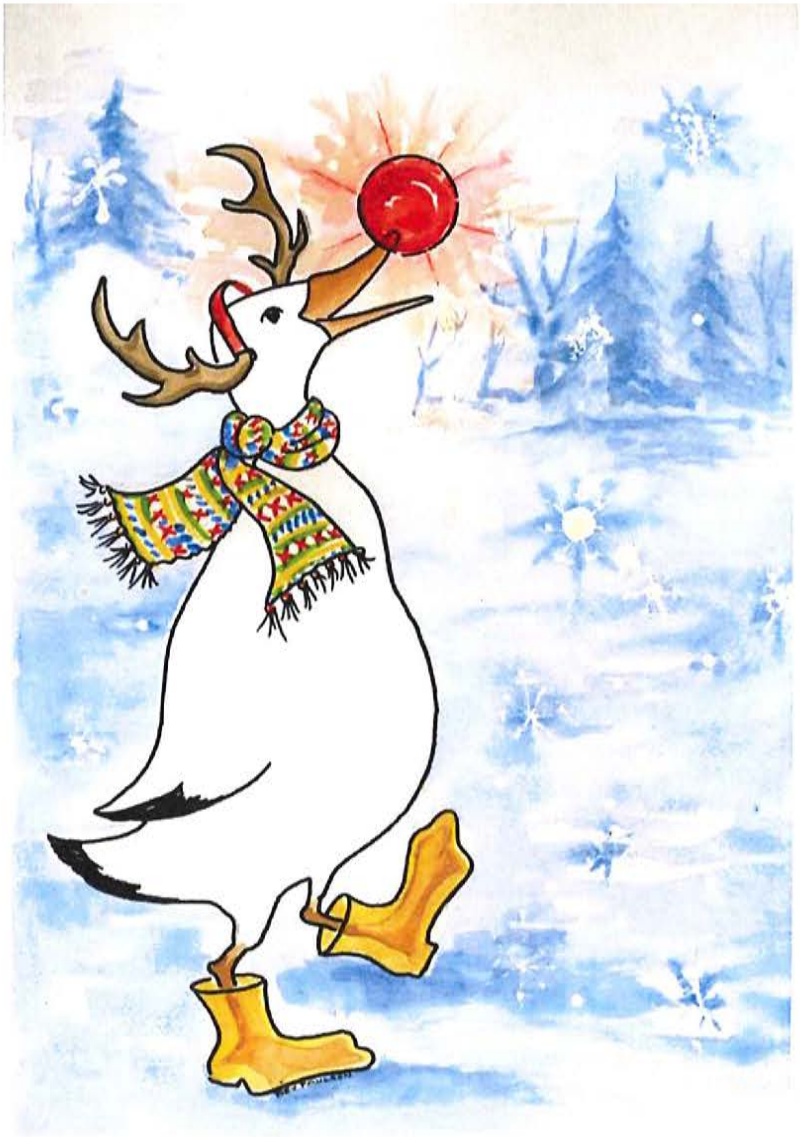
Answered: 17 Skipped: 4

#	Responses	Date
1	Ground is so waterlogged in spring in backyard on the north side area no one can mow lawn, mud is 4" to 5" deep. By the end of June it has dried out some.	1/22/2014 11:08 AM
2	None	1/22/2014 9:49 AM
3	The holding pond by my house is a breeding ground for mossquitos.	1/16/2014 3:06 PM
4	The City should take over maintenance and ownership of ALL drainage ponds in the city limits. This will ensure uniformity and proper maintenance. Storm water ponds are the weak link in the system- privately maintained by novice home owners. Modest fees to defer the cost of the maintenance of the pond could be incorporated into existing drainage fees. Housing Developments bring revenue to local business and strengthen the local economy. Support the Stanwood residents and take over the drainage ponds.	1/16/2014 9:40 AM
5	Our yard is a low spot in the neighborhood. Property has storm drain, but it is on the high side near street, so only during extensive flooding does the water drain out.	1/14/2014 10:19 PM
6	No	1/14/2014 2:32 PM
7	Use enviormental friendly. When spraying for weeds & blackberries. City killed alot more enviornment than intended.	1/14/2014 11:25 AM
8	No	1/13/2014 8:05 PM
9	The main issue is a failed water retention system at stanwood town center: I put yellow dye in their system and my land turned yellow.	1/13/2014 7:47 PM
10	Drain water from housing hope apts at 72nd & 276th should have been piped over to the storm drain on the east side of 72nd instead of into the ditch on west side	1/13/2014 7:31 PM
11	No	1/13/2014 7:15 PM
12	Snohomish County kept these ditches cleaned until they were annexed to the City of Stanwood. They told me they could still do it, but needed an inter-local agreement with the City first. In 2009 I talked to Andy Bullington numerous times regarding this problem, but nothing was ever done. It has been about 20 years since the ditch along 264th st has been cleaned.	1/13/2014 3:06 PM
13	No	1/10/2014 3:06 PM
14	The issue has increased steadily over the past 10 years and we have not been able to find a viable way to reduce the flooding to our property.	1/8/2014 8:41 PM
15	The GMA and/or Comprehensive Plan update(s) should not be used to demand a greater monthly payment from homeowners residing in neighborhoods that have already paid escalating storm/sewer charges over a period of decades and helped to retire many bonds in favor of the City. I believe the facilities already in place are more than adequate to serve the development base that they were designed for almost indefinitely with normal maintenance. Unless all of these facilities are suddenly failing and need to be replaced as a result of age/deterioration (rather than the impact of poorly funded growth) I would protest the imposition of additional long-term indebtedness on existing construction to be shared along with new development. In effect, it is starting the clock all over again and asking owners to pay again for that which they have already paid for in the past. In fact, the City has already implemented major increases in storm/sewer charges over the years that in my opinion represent an unwarranted burden on existing homeowners.	1/8/2014 4:41 PM
16	No	1/7/2014 11:49 AM

17	Two homes above me have flooded twice from this problem. The entire system has failed and it is no one's fault and apparently no one's concern. We are blessed with surface water from the entire subdivision. Just look at 86th street during and after rain and you will see the problem. It even runs across Pioneer Highway. Thanks for asking. What will be done about it? What can be done about it?	1/7/2014 9:36 AM

CITY OF STANWOOD
2014 BUDGET

City of Stanwood
2014 Budget Summary



Painting by Bev Paulson, local artist

CITY OF STANWOOD
2014 BUDGET

City of Stanwood
2014 Budget
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CITY OF STANWOOD
2014 BUDGET

DRAINAGE SUMMARY:

The City owns, operates and maintains the entire storm drainage system to include piping, approximately 1554 catch basin, detention ponds, ditches, Irvine Slough and the Irvine Slough pump station.

The City's practice of maintaining all detention ponds was called into question when an ownership search revealed 7 ponds were actually privately owned through HOA's or plat assessment. A subsequent meeting was set up with the people affected by this discovery and a plan is in the works to determine how and by whom maintenance will now be accomplished on these privately owned facilities.

Purpose of Drainage Utility

The purpose of the drainage utility operating fund is to promote quality of storm water in the city. The fund is used to maintain the City's storm water conveyance and treatment facilities and construct storm water capital projects.

A drainage utility is essentially a special assessment district set up to generate funding specifically for surface water management. Users within the district pay a drainage utility fee, and the revenue generated directly supports maintenance and upgrade of existing storm drainage systems; development of drainage plans, flood control measures, and the water-quality programs; administrative costs; and sometimes construction of major capital improvements. Unlike a surface water program that draws on the general tax fund or uses property taxes for revenue, the people who benefit are the ones who pay.

Surface water management within the City is governed by federal, state, regional, county and city laws including the Clean Water Act, Endangered Species Act, the Growth Management Act, Shoreline Management Act, State Environmental Policy Act, Stormwater Management Performance Standards and Puget Sound Water Quality Action Plan.

There are a number of state statutes that pertain either directly or indirectly to the City's authority to form a drainage utility. One of the more broad based statutes pertains to municipal utilities in general and states that a code city may provide utility service within and outside its city limits and this includes the exercise of all the powers to the extent authorized by law (RCW 35A.80.010).

2014 DRAINAGE OPERATING REVENUES:

The drainage utility fee is based on the relative contribution of increased surface and storm water runoff from a given parcel to the storm water system.

CITY OF STANWOOD
2014 BUDGET

The percentage of impervious surfaces on the parcel and the total parcel acreage is used to indicate the relative contribution of increased surface and storm water runoff from the parcel to the storm water system.

The relative contribution of increased storm water runoff from each parcel will determine that parcel's share of the drainage utility fee revenue needs.

The drainage utility fee revenue needs of the utility are based upon all or any part, as determined by the Council, of the cost of storm water services or to pay or secure the payment of all or any portion of any issue of general obligation or revenue bonds issued for such purpose.

Table 15 – Drainage Utility Revenues

Description	2011 Actual	2012 Actual	2013 Budget	2014 Budget
Beginning Balance	$ 215,900	$ 400,539	$ 578,866	$ 600,000
Revenues				
Charges for Services	$ 421,215	$ 441,596	$ 425,000	$ 425,000
Misc. Revenues	$ 668	$ 1,408	$ 1,300	$ 1,300
Total Revenues	$ 421,884	$ 443,004	$ 426,300	$ 426,300

2014 DRAINAGE OPERATING BUDGET:

Detention pond maintenance has been difficult to accomplish. The City has a combination of regular and seasonal employees to maintain the ponds during the summer months. The workload exceeds staffing levels. The 2014 budget includes funding for a part time seasonal employee.

The total 2014 proposed drainage operating budget, including non-operating expenditures such as machinery and equipment, is $365,080, which allows for $173,200 transfers-out to capital funds and a projected ending cash balance of $488,020.

CITY OF STANWOOD
2014 BUDGET

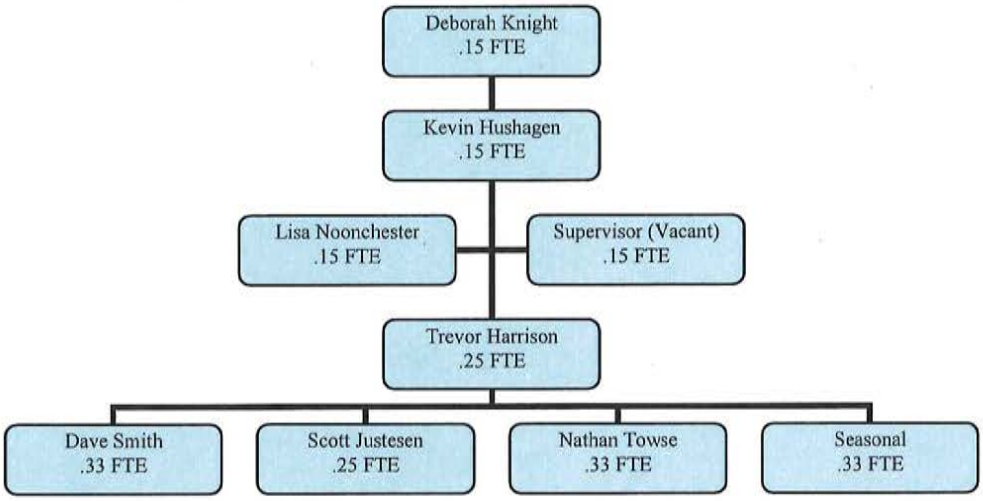
Table 16 – Drainage Utility Expenditures

Description	2011 Actual	2012 Actual	2013 Budget	2014 Budget
Operating Expenditures				
Salaries & Wages	68,053	67,477	96,400	121,520
Overtime	1,550	796	400	463
Social Security	5,325	5,222	7,500	9,332
Retirement	3,802	4,600	8,000	11,897
Medical Benefits	17,827	20,890	23,500	32,803
L & I	1,658	1,543	2,600	2,549
Unemployment Insurance	835	1,435	1,200	3,659
Supplies	1,056	1,716	2,500	4,000
Uniforms	700	745	1,200	1,200
Fuel	1,229	1,641	1,500	1,500
Small Equipment	0	0	400	1,000
Professional Services	14,927	56,416	42,500	42,500
Communications	2,449	2,364	3,000	3,000
Rentals	0	71	500	500
Insurance	36,805	32,898	30,600	30,600
Utilities	6,453	8,494	10,000	10,000
Repair/maintenance	1,631	172	4,500	4,500
B & O Tax	7,195	7,549	6,200	6,200
Meetings, Training & Travel	0	0	758	750
State Operating Permits	0	0	600	600
Interfund Payment For Servic	55,749	40,580	46,395	51,507
Advertising	0	67	0	0
Total Operating Expenditures	227,244	254,676	290,253	340,080
Non-Operating Expenditures				
Machinery & Equipment	0	0	0	25,000
Total Non-Operating Exp.	0	0	0	25,000
Total Expenditures	227,244	254,676	290,253	365,080
Less: Transfers-Out	-10,000	-10,000	-110,000	-173,200
Ending Cash Balance	400,539	578,866	604,913	488,020

CITY OF STANWOOD
2014 BUDGET

2014 Staffing Levels

The 2014 budget includes 1 new staff hired at the end of 2013. This is still minimal staffing to maintain Stanwood's drainage system. There are approximately 2.09 full-time equivalent (FTE) dedicated staff to this department. The staff in this department maintains drainage infrastructure including ponds ditches and Irvine Slough pump station.



2013 Drainage Accomplishments

- Met with HOA's and property owners regarding ownership of ponds
- Added drainage on 270th by Bank of America
- Added drainage on Florence road
- Brought ponds up to standards and turned over to select home owners
- Finished cleaning all catch basins
- Put out RFP's to develop stormwater comprehensive plan
- Received $300,000.00 grant for study of Irvine Slough

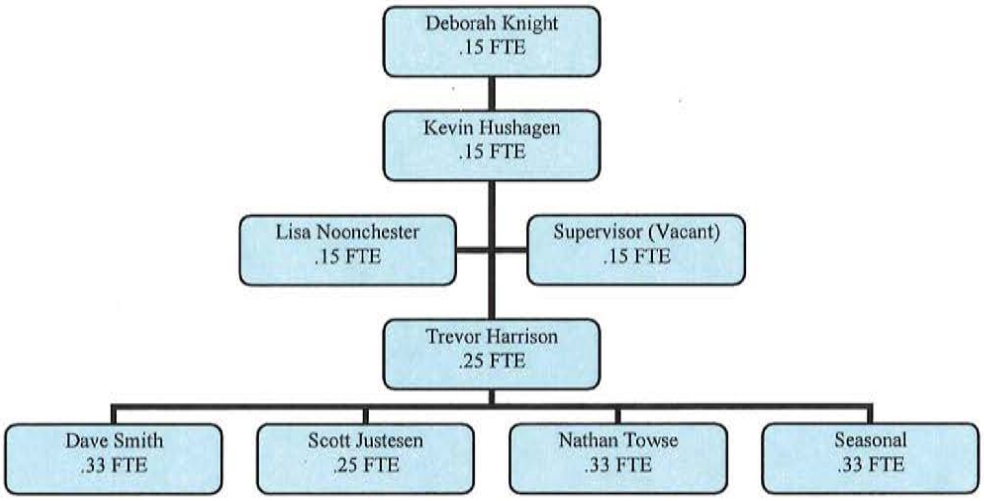
2014 Drainage Goals

- Continue working with home owners on pond maintenance and ownership
- Fix drainage on 85th
- Continue work to install berm on SR 532
- Conduct study on Irvine Slough
- Fix drainage on 270th

CITY OF STANWOOD
2014 BUDGET

2014 Staffing Levels

The 2014 budget includes 1 new staff hired at the end of 2013. This is still minimal staffing to maintain Stanwood's drainage system. There are approximately 2.09 full-time equivalent (FTE) dedicated staff to this department. The staff in this department maintains drainage infrastructure including ponds ditches and Irvine Slough pump station.



General Fund

The proposed 2014 general fund budget is $218,762 out of balance (i.e revenues less than expenditures) primarily due to the following:

1. Community development has requested a total of $259,000 in professional services, which represents a $194,500 increase over the prior year. The professional services budget includes: planning review ($60,000), plan checking ($35,000), city engineer ($25,000), on-call landscape architect ($5,000), comprehensive plan update ($120,000) and on-call inspector ($14,000).

   Another $50,600 of additional wages and benefits have been requested for a second part-time planner to handle the additional workload associated with the increase in buildings generated in 2013 and anticipated for next year.

   The city originally budgeted $86,500 based on the assumption of thirty (30) residential building permits. To date, the city has received $186,031 from sixty (60) residential permits. Including other permit and review fees, the 2013 budget has been revised upward to include a total increase of $156,000. The additional revenues will be used in 2014 to hire the additional professional services and staff to handle the increased work load associated with substantially higher permit activity.

2. The police protection contract, as proposed by the Snohomish County Sheriff, includes an increase of $70,923, from $1,407,373 to $1,478,296 per year (5% increase). The Sheriff previously proposed an increase of $109,741 (7.8%), however, through further negotiations an additional $38,818 reductions were made to the 2014 contract amount as follows:

• Averaging increases over 3 years	$29,514
• Records management	$ 4,103
• Outside training	$ 1,100
• 5% credit – records specialist	$ 4,101
Total	$38,818

3. This budget presented to the city council at this workshop includes a general fund deficit of $218,762. This amount is being offset of the approximate $225,000 additional building permits and related revenues that have resulted from the 60 building permits that were issued in 2013 (twice the 30 permits that were budgeted).

Revenue and Expenditure Assumptions

City staff have completed the revenue and expenditure assumptions for the 2014 general fund budget. Overall revenues remain flat. The city expects to collect $5,448,389 in general fund revenues in 2014, which is a $93,998 (1.8%) increase from the prior year.

On the positive side, property taxes will increase about $82,500. Most of this increase ($62,500) is due to the $18.7 million in new construction added to the tax rolls last year, while the remaining $20,000 is the proposed 1% increase as allowed by law.

Actual sales tax for 2013 is expected to come in at about $1,030,000, which is $105,000 more than budget, largely due to strong construction sales. The 2014 budgeted sales tax is $1,030,000 (same as 2013 projected) to reflect continued slow growth in the economy next year.

Table 1 - General Fund Revenue Summary

Description	2012 Actual	2013 Budget	2014 Proposed	Percent of Budget	Comment
Operating Reserve	1,685,980	1,860,614	1,600,000	29%	mimimum of 16.7%, or $909k per financial policy
Taxes (property, EMS, sales and utility)	4,178,348	4,213,700	4,438,400	81%	Ppty taxes up $82k and sales taxes up $105k for new construction
Licenses and Permits	252,698	293,200	211,120	4%	Farmers Mkt grant closed in 2013 ($53,876 diff); estimated 30 res bldg permits
State Revenues	246,650	226,624	229,730	4%	
Charges for Service	506,441	531,417	522,789	10%	
Fines and Forfeitures	36,004	44,500	40,350	1%	
Misc. Revenues	8,929	5,950	6,000	0%	
Transfers-In	-	39,000	-	0%	to reimburse general fund for TBD election and insurance costs
Total Revenues	5,229,071	5,354,391	5,448,389	100%	
Total Resources	6,915,051	7,215,005	7,048,389		

General Fund Revenues

- Property tax revenues are projected to increase by $82,500 (4.2%). This is primarily due to the $18.7 million new construction that was recently added to the tax rolls, which generates an additional $62,500 in property tax revenues. The remaining

$20,000 increase assumes council approval of the 1% increase as allowed by law. Any new construction in 2014 will be credited to the city in 2015. Any property sales will increase the city's Real Estate Excise Tax (REET) collection. REET proceeds are used to support capital projects and street operations.

- The EMS levy budget proposal will increase by $24,300 due to the 8% increase in assessed valuation (AV), which will maintain the current $0.50 per $1,000 levy rate (the statutory limit). The levy is calculated at $320,300 ($640,600,000 AV X $0.50 / $1,000 = $320,300).

- Sales tax for 2013 was budgeted very conservatively at $925,000. For the first nine months of this year, sales tax revenues are $777,627, which is up $81,181 (11.7%) from the first nine months of 2012. Of the $81,181 increase in sales tax, $42,879 (53%) comes from construction sales tax, while the remaining $38,302 (47%) comes from non-construction. At the current rate, sales tax revenues for 2013 should be about $1,030,000 ($905,000 + $125,000 construction). 2014 sales tax revenues are conservatively projected to be about the same as 2013.

- Electric utility tax revenues are expected to increase $8,000 (2.7%) based on the PUD overall 2.7% rate increase that became effective on October 1, 2013.

- Water/sewer/drainage utility tax revenues are anticipated to increase by $9,300 based on the proposed 5% increase in water rates and 3.5% increase in sewer rates for 2014.

- Building permit revenues continue to be a big unknown factor in next year's budget. This year the city so far has issued sixty (60) residential building permits for $164,086. The city budgeted just thirty (30) permits for $87,000, so the city has exceeded its permit revenues to date by $77,000. For 2014, the city has assumed another thirty (30) residential building permits as a conservative estimate. The city needs to carefully match building permit revenues and expenditures; the current budget proposal uses an additional $156,000 in unanticipated 2013 building-related revenues (identified in the recent 2013 budget amendment) to offset planned increases in the 2014 community development budget.

The "5 Year Budget Comparison" report (Attachment B) provides a line-item comparison between 2010 and 2014. The "comments" column on the far right gives details on the assumptions used to develop the draft budget.

Table 2 - General Fund Expenditure Summary

Description	2012 Actual	2013 Budget	2014 Proposed	Percent of Budget	Comment
Clerk and City Council	258,934	264,485	143,492	3%	Transferred Admin II position to Admin Dept
Judicial	20,628	45,000	30,000	1%	Reduced by $15k (low usage)
Mayor	18,604	21,900	23,012	0%	$100/mo increase per salary commission recommendation
Administration	489,258	508,300	619,856	11%	Includes Admin II and $30k for 2-year audit
Legal	83,456	102,000	80,000	1%	Includes $10k for litigation
Buildings and Grounds	89,509	139,700	124,943	2%	Includes 0.80 FTE staff
General Gov't Services	68,263	63,640	68,764	1%	
Law Enforcement	1,663,313	2,087,644	1,796,866	32%	New 5-year contract w/ Sheriff. Annual contract increased $70,923 (5%) over last year.
Fire Control	1,247,340	1,279,400	1,290,480	23%	No contract increase due to flat assessed values since 2011
Jail Costs	39,814	66,000	66,000	1%	Kept the same (low usage)
Emergency Services	39,066	6,726	7,129	0%	Sno Co DEM contract
Ambulance	77,500	-	-	0%	Now included in fire contract
Community Development	469,541	487,845	783,133	14%	Includes $120k comp plan update and $51k for second PT planner
Substance Abuse	1,621	1,000	1,000	0%	
Library	243,286	266,430	301,200	5%	Contract increase due to 8% increase in assessed value
Parks	103,067	153,550	195,939	3%	1.61 FTE staff + 973 hours seasonal
Transfers / Misc	141,238	159,596	135,337	2%	
Total Expenditures	5,054,438	5,653,216	5,667,151	100%	

General Fund Expenditures

Salaries and benefits

- **Teamster's Contract COLA.** The Teamsters' contracts and the 2014 budget proposal provides for a 2% cost of living adjustment (COLA) for represented employees.

- **Non-Represented Employees.** On January 1st of each year, full-time, non-represented employees may, in addition to contract adjustments, receive an annual salary increase based on performance as determined by the mayor. The total amount of performance increases shall not exceed the performance pool, which is calculated by the finance director and authorized by the city council as a percentage share of annual full-time, non-represented salaries, which is assumed to be 3% (same as last year).

- **Benefits.** AWC has announced no premium increases estimates for 2014 based on cost savings due to the fact that AWC will become self-insured effective January 1, 2014. Based on average annual increases of 10% that the city has seen in the past, this saves the city about $50,000 per year in benefit premiums for its employees.

- **Part-time Planner.** In 2012 the city hired a contract planner for $60,000 per year to help with the additional workload in the community development department as a result of increased building permit activity.

  This position was converted to a part-time staff position (22.5 hours per week) in 2013 at a total staffing cost of about $50,000. In 2014, the budget provides for a second part-time planner for another $50,000, again to assist with the increased workload due to building permit activity.

  So for this year the city has received sixty (60) residential building permits, which is twice the budgeted amount of thirty (30).

  The additional one-time expenditures in community development for 2014 will be paid for out of one-time permitting revenues received in 2013 and 2014.

  The goal is to ensure the city provides outstanding customer service as the economy continues to recover.

- **Position Reclassifications.** The city continues to review its current job classifications to ensure that they match up with the duties that city employees are currently performing. Two of the positions that were identified for reclassification in 2014 were the police records clerk and the public works administrative assistant. Under the 2014 budget proposal, both positions would be reclassified as admin II in order to better match up duties and positions. This move would increase city payroll by about $6,400.

- **Finance Department Reorganization.** Last year the city reorganized the city clerk department. By consolidating clerk duties between the finance director and the deputy clerk II, the city reduced 0.50 FTE staff and saved about $40,000. The front office position, formerly held by Julie Johnson, had been classified at a deputy clerk I, which was a holdover from when she performed those duties.

  When the position is re-filled, it will be classified as an admin II and coded to the administration department budget (instead of the clerk department budget) to more accurately reflect the actual duties of the position.

  Staff anticipates that this position will be filled with a permanent full-time employee by December 31, 2013.

- **Contracts for Service.** The city contracts for library, police and fire/EMS services. While revenues have declined over the past several years and

property assessed values have fallen, the city is locked in by contract to pay higher rates for contract services.

- **Library contract.** Council will decide next year (2014) whether to hold a library annexation vote in 2015, For 2014, the city will continue to contract with Sno-Isle until such time that a library annexation becomes effective (2016 at the earliest).

  The library contract with Sno-Isle will cost the city $289,200, plus the city will pay utility costs of about $12,000, for a total 2014 library budget of $301,200.

- **Police contract.** The police contract will expire December 31, 2013. The city and the Sheriff have tentatively agreed on a 5% increase for 2014, which will be presented for council approval. The new contract will be for five years (2014-2018).

  The current proposal by the Sheriff is for an annual increase of $70,923 (5%), from $1,407,373 to $1,478,296, primarily due to personnel costs, which makes up the majority of their budget.

  After the initial 5% in 2014, the proposed contact would increase by 5% in 2015 and 2016.

- **Fire contract.** The city agreed to pay $2.00 per $1,000 assessed value, with 2011 assessed valuation established as a contract floor. In 2011, when the contract was established, the city's assessed valuation was $$639,969,397.

  Based on the contact formula of $2 per $1,000 /AV, the original 2012 annual contract amount was set at $1,279,939 ($639,969,397 X $2 / $1,000 = $1,279,939).

  In 2013, even though the city's assessed value decreased to $591,926,022, the fire contract remained at the 2012 amount ($1,279,939) due to the "floor provision" in the contract (i.e. the contract amount cannot fall below the 2012 level).

  Preliminary estimates from the Snohomish County Assessor reflect that the city's assessed valuation for 2014 will increase back to 2012 levels (about $639,000,000).

  Because this valuation is still below 2012, albeit slightly, the annual fire contract once again will remain flat at $1,279,939.

  Note that in future years, as the assessed valuation of the city increases, the fire contract will increase accordingly (at the rate of $2 per $1,000 / AV).

- **Transportation Benefit District.** The city will receive about $200,000 per year in sales tax revenues to pay for much-needed street projects, including:
  - 270th between Florence Road and 88th
  - 92nd from the bowling alley to 276th

- **Economic Development.** The mayor's budget provides for a $25,000 increase in economic development, from $7,500 to $32,500. This amount currently includes:
  - $15,000 support generated from the $15/year business license increase
  - $7,000 marketing materials
  - $6,000 incentives
  - $3,000 holiday promotion
  - $1,500 small grant program

CAPITAL BUDGET

Adopting the annual capital improvement budget is one of the most important actions the city council takes during the budget process. It signals to the community the city's priorities and can either encourage or discourage private investment in different areas of the city.

While the city council adopts a capital budget each year, the planning and actual expenditure of funds for capital projects generally occurs over a period of years. The city's Comprehensive Plan, Capital Facilities Plan, Transportation Improvement Plan, Water System Plan, General Sewer Plan, Park and Recreation Open Space Plan and

Stormwater Management Plan identify the capital improvements needed to serve existing residents and maintain levels of service as new residents and businesses move into the city. The city council also adopts a set of community improvement goals as a part of the annual budget process. The Mayor's Recommended Capital Budget meets the following council goals:

2014 Council Budget Goals

Maintain existing city facilities	**$3,382,871**	
• City Hall and Police Department Renovations		$1,066,671
• Street maintenance using TBD Funds		$148,200
• Complete Water/Sewer Bond Improvement Projects		$1,788,000
• Restore water service from Hatt Slough		$255,000
• Heritage Park and Church Creek Renovations		$60,000
• Sidewalk and Street Repair Projects		$65,000
Restore community access to Stillaguamish River	**$2,560,500**	
• Ovenell and Hamilton property acquisitions		$2,490,500
• Master plan		$70,000
Protect the Community from Flooding	**$710,000**	
• SR532 Berm/Bike and Pedestrian Path		$100,000
• Irvine Slough Pump Station Restoration		$245,000
• Irvine Slough Conveyance Study		$300,000
• Drainage Improvement Projects		$65,000
Develop Bike and Pedestrian Trail System	**$250,000**	
• 68th Street Safe Routes to Schools		$250,000

Support Economic Development **$160,000**

- Downtown park $50,000
- Viking Way and 90th Street Grid Roads $110,000

The mayor and city council work together to prioritize capital improvements within existing city resources. When additional resources are needed to fund capital projects, the mayor and council evaluate whether to raise additional revenues by increasing user fees, reducing expenses or reprioritizing the capital budget.

The city council is currently considering proposals to raise water and sewer rates in part to generate sufficient revenues to fund future capital improvements. The current rate structure is not sufficient to fund both operating and capital expenses.

The water and sewer operating budgets include transfers to the capital budgets based on the assumption the proposed rate increases will be approved. A decision not to approve a utility rate increase or a reduced increase will affect a number and type of future capital improvements.

What is the Capital Budget?

The City of Stanwood defines capital improvements as investments in infrastructure costing more than $5,000 with a useful life of more than one year.

This may include everything from major renovations in Heritage Park to new road construction or road reconstruction. The capital program is generally financed by sources of revenue dedicated to capital improvements including Real Estate Excise Taxes, Impact Fees, Plant Investment fees and borrowing.

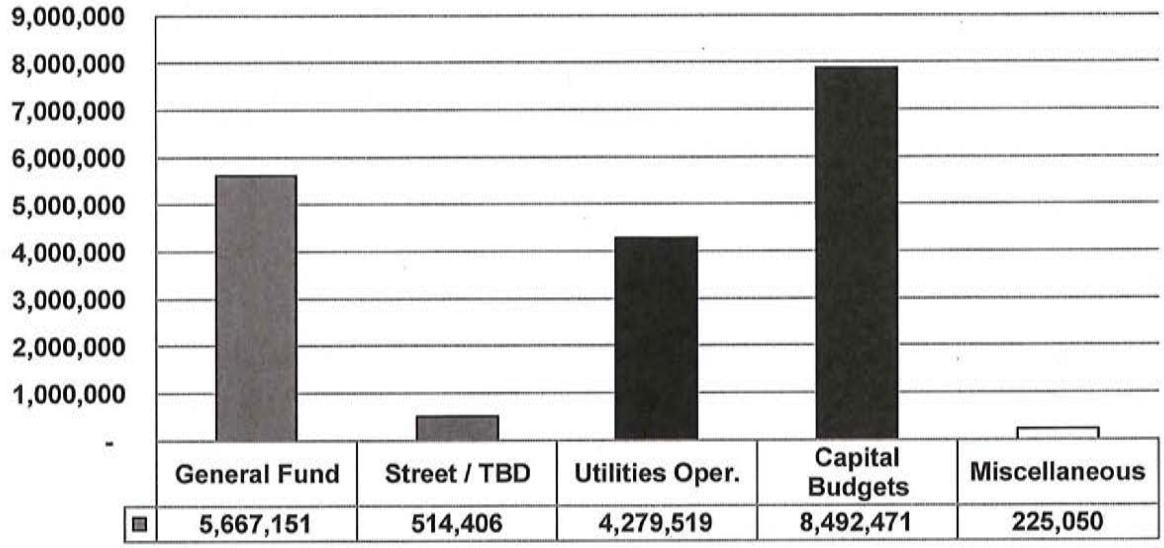
The Capital Budget differs from the city's Operating Budgets. The operating budgets cover the day-to-day operations and are financed by property, sales and utility taxes, and fees for service.

In 2014, over 60% of the capital budget is funded with city revenue, and the rest is supported by state and federal grants. City revenues include funds borrowed by issuing bonds.

The benefit of issuing bonds to pay for capital projects is to spread the cost of facilities over the life of the project and ensure both current and future residents who benefit from the project share equally in the cost of the project.
The city is funding 4 projects in 2014 totaling approximately $2,100,000 from the remaining revenues in the 2011 Water/Sewer Revenue bonds. When resources from the bonds are spent, the principal and interest payments on the 2011 Water and Sewer Revenue Bonds ($2.88 million) will be expensed from the water operating fund (Fund 421).

The 2014 water operating budget proposes early payoff of two bonds using reserves in order to reduce the on-going expense of annual debt service payments and free up funds for current expenses and future capital projects.

2014 Budget Summary



Revenue Sources

Revenues to support the capital budget come from real estate excise taxes, plant investment fees, impact fees related to new growth, bond proceeds, grants and loans.

Revenue sources for capital projects tend to be restricted to specific uses with the exception of Real Estate Excise Tax (REET 1 and REET2) which can be used for capital improvements listed in the city's adopted capital facilities plan.

The following revenue sources and expenditure's table summarizes the 2014 capital budget. Additional detail is available in Attachment A which lists the proposed city projects. Attachment B is the capital budget reports from the city's financial software system.

Table 17 – 2014 Capital Budget

2014 Revenue Sources and Expenditures (all amounts x $1,000)							
Funding Sources	**Streets (103)**	**Parks (104)**	**Bld Imp (110)**	**Sewer (403)**	**Drainage (411)**	**Water (422)**	**2014 Total**
Beginning Fund	$150	$100	$860	$1,700	$350	$2,000	**$5,160**

Grants	$313	$2,531	$0	$0	$300	$0	**$3,144**
Transfers	$50	$139	$318	$440	$189	$351	**$1,487**
TBD	$148						**$148**
Interest	$1	$0	$3	$6	$1	$2	**$13**
Total Revenues	**$662**	**$2,770**	**$1,181**	**$2,146**	**$840**	**$2,353**	**$9,952**
Expenditures	$630	$2,670	$1,067	$1,091	$750	$2,285	**$8,493**
Ending Fund	**$32**	**$100**	**$114**	**$1,055**	**$90**	**$68**	**$1,459**

Real Estate Excise Taxes (REET 1 and REET 2)

Description of Real Estate Excise Taxes

The real estate excise tax is levied on all sales of real estate, measured by the full selling price. The state levies this tax at the rate of 1.28 percent. A locally-imposed tax is also authorized. All cities may levy a quarter percent tax (referred to as "the first quarter percent of the real estate excise tax" or "REET 1").

Cities that are fully planning under GMA are given the authority to levy a second quarter percent tax ("REET 2").

How Can REET Proceeds Be Spent?

Cities with a Population of 5,000 or More That Fully Are Planning Under GMA (this applies to the City of Stanwood). These jurisdictions must spend the first quarter percent (REET 1) of their real estate excise tax receipts solely on capital projects that are listed in the capital facilities plan element of their comprehensive plan.

The second quarter percent (REET 2) may only be levied by cities that are required to or choose to fully plan under the Growth Management Act. All cities that levy this tax face the same provisions, whether their population is greater or less than 5,000.

In 2011 the state legislature expanded, for a limited period of time, the uses of REET 1 by amending RCW 82.46.010, and the uses of REET 2 by amending RCW 82.46.035, so that both REET 1 and REET 2 may now be used for a portion of operations and maintenance of existing capital projects.

Assumptions – 2014 Real Estate Excise Taxes

For 2013, staff projected about $80,000 in REET 1 revenues and another $80,000 REET 2 revenues ($160,000 total). It now appears that actual 2014 REET revenues will come in pretty close to projections, based on about $32 million in gross sales ($32

million X .0025 = $80,000). Based on an assumption of slow and steady growth in the economy for 2014, staff is projecting that the city will receive the same amount of REET revenues in 2014 (i.e. $80,000 apiece, for a total of $160,000).

Revenues and Transfers – 2014 Real Estate Excise Taxes

The 2014 proposed budget includes transfers from REET funds to support new and existing capital projects as follows:

Table 18 - Summary of REET 1 Fund Activity (Fund 120)

Description	2012 Actual	2013 Budget	2014 Proposed
Beginning Cash	624,051	723,479	660,000
REET 1 Revenues	100,663	80,000	80,000
Misc Revenues	1,901	2,000	2,000
Total Revenues	102,565	82,000	82,000
Transfer to Park Improve. Fund	-	120,000	120,000
Transfer to Bldg. Improve. Fund	-	-	318,000
Transfer to GO Bond Fund	3,137	3,021	-
Transfer to Street Fund	-	22,150	-
Total Transfers	3,137	145,171	438,000
Ending Cash	723,479	660,308	304,000

Table 19 - Summary of REET 2 Fund Activity (Fund 121)

Description	2012 Actual	2013 Budget	2014 Proposed
Beginning Cash	609,124	501,852	450,000
REET 2 Revenues	100,663	80,000	80,000
Misc Revenues	1,431	1,500	1,500
Transfer-In from Conting. Fund	-	102,300	
Total Revenues	102,094	183,800	81,500
Debt Service - 800 Mhz	18,729	168,561	-
Transfer to GO Bond Fund	3,137	3,021	-
Transfer to Street Fund	187,500	100,000	116,000
Total Transfers	209,366	271,582	116,000
Ending Cash	501,852	414,070	415,500

Plant Investment Fees

Description of Plant Investment Fees

Plant investment fees are charged to recover an equitable share of the costs of water, sewer and drainage facilities from those properties within the utility service areas which, as a part of their development and use, create needs for those facilities. Plant investment fees were designed and calculated to be of such amount as will eventually create reasonable reserves to pay the public's fair share of basic and essential service facilities as the need arises.

The city has determined that the capital cost of the city's current and future water system, including pumps, wells, distribution lines, reservoirs and rights-of-way is $43,820,345. The capital cost of such system has been borne by the city and its water system users. Such water system will be utilized by newly connecting properties, and the capital cost, as applied to buildings presently served, is $6,122 per each three-quarter-inch water meter.

In order to recover capital costs of water system improvements in the Cedarhome area ($2,732,000), additional water plant fees are charged as follows:

The city has determined that the capital cost of the city's current and future sewer system, including pumps, collection pipelines, sewer treatment plant, and rights-of-way, is $26,293,050. The capital cost of such system has been borne by the city and its sewer system users. Such sewer system will be utilized by newly connecting properties

and the capital cost, as applied to buildings presently served, is $6,476 per each three-quarter-inch water meter.

The city has determined that the capital cost of the city's drainage system, including pumps, collection pipelines and rights-of-way, is $3,270,401. The capital cost of such system has been borne by the city and its drainage system users. Such drainage system will be utilized by newly developed properties, and the capital cost, as applied to buildings presently served, is $665.00 per each equivalent unit.

Currently the city charges plant investment fees as follows:

Table 20 – Summary of Plant Investment Fees

Service Connection Size	Equivalent Connection	Water Plant Inv. Charge	Cedar Home Plant Inv. Charge	Sewer Plant Inv. Charge
Up to 3/4"	1.00	$5,280	$2,570	$6,476
1"	1.67	$8,818	$4,292	$10,815
1-1/2"	3.33	$17,584	$8,558	$21,565
2"	5.33	$28,144	$13,698	$34,517
3"	10.00	$56,342	$25,700	$64,760
4"	16.67	$88,024	$42,842	$107,955
6"	33.33	$175,995	$85,658	$215,845
8"	53.33	$281,603	$137,058	$137,058

Assumptions Plant Investment Fees

Presented below is plant investment revenue data since 2011. Note that year-to-date 2013 plant investment fees are about twice as much as 2013 budget. This is due to the fact that year-to-date residential housing permits are more than double the original thirty (30) permits that were projected.

For 2014, staff continues to conservatively project thirty (30) residential building permits. Of course, if actual permits (and corresponding plant investment fee revenues) come in higher than expected, budget amounts can always be adjusted upward through the budget amendment process.

Table 21 – Five Year Comparison of Plant Investment Fees

Description	2011 Actual	2012 Actual	2013 Actual YTD	2013 Budget	2014 Budget
Sewer PIF	90,776	278,356	414,399	195,000	195,000
Drainage PIF	10,755	28,795	42,625	20,000	20,000
Water PIF	69,562	226,198	338,520	158,400	158,400
Water PIF - Cedarhome	30,840	110,510	164,480	77,100	77,100
Total Plant Invest Fees	201,933	643,859	960,024	450,500	450,500

Revenues and Transfers – 2014 Plant Investment Fees

The 2014 proposed budget includes transfers from plant investment fee funds to support new and existing capital projects as follows:

Table 22- Summary of Sewer Plant Investment Fee Activity (Fund 405)

Description	2012 Actual	2013 Budget	2014 Proposed
Beginning Cash	457,920	537,445	750,000
Plant Investment Fees	278,356	195,000	195,000
Misc Revenues	1,169	1,100	1,100
Total Revenues	279,525	196,100	196,100
Transfer to Sewer Const. Fund	200,000	194,280	194,280
Total Transfers	200,000	194,280	194,280
Ending Cash	537,445	539,265	751,820

Table 23 - Summary of Drainage Plant Investment Fee Activity (Fund 412)

Description	2012 Actual	2013 Budget	2014 Proposed
Beginning Cash	48,322	77,269	100,000
Plant Investment Fees	28,795	20,000	20,000
Misc Revenues	153	200	200
Total Revenues	28,948	20,200	20,200
Transfer to Drainage Const. Fund	-	19,950	19,950
Total Transfers	-	19,950	19,950
Ending Cash	77,269	77,519	100,250

Table 24 - Summary of Water Plant Investment Fee Activity (Fund 424)

Description	2012 Actual	2013 Budget	2014 Proposed
Beginning Cash	10,384	236,735	400,000
Plant Investment Fees	226,198	158,400	158,400
Misc Revenues	153	500	500
Total Revenues	226,351	158,900	158,900
Transfer to Water Const. Fund	-	158,400	158,400
Total Transfers	-	158,400	158,400
Ending Cash	236,735	237,235	400,500

Table 25 - Summary of Water PIF - Cedarhome (Fund 423)

Description	2012 Actual	2013 Budget	2014 Proposed
Beginning Cash	48	110,608	275,000
Plant Investment Fees	110,510	77,100	77,100
Misc Revenues	49	300	300
Total Revenues	110,559	77,400	77,400
Transfer to Water (Debt Svc.)	-	-	139,519
Total Transfers	-	-	139,519
Ending Cash	110,608	188,008	212,881

Impact Fees (Traffic, Park and Fire)

Description of Impact Fees

New residential and nonresidential development causes increased demands on public facilities, including streets, roads, parks, open space, recreational facilities, fire facilities and schools. To the extent that new development places demands on the public facility infrastructure, impact fees are imposed to shift a proportionate share of the cost of such new facilities from the public at large to the developments actually creating the demand.

Traffic Impact Fees

Transportation impact fees are imposed upon all new developments that generate new additional traffic within the city based on the estimated number of additional trips generated.

Traffic impact fees are paid by new development to mitigate the impacts of new development on the city's existing transportation network. Impact fees cannot be used for operating expenses.

Based on planned development for 2014, Street Impact Fee revenue is budgeted at $66,500 which is based on the current transportation impact fee rate of $2,216.12 per single family unit ($231.57 per trip). The city expects to issue permits for thirty (30) more single-family residential units in 2014. In addition, interest income is projected to be $1,500.

In 2014, $50,000 is budgeted to be transferred to Fund 103, Street Construction the Viking Way project.

Table 26 - Summary of Traffic Impact Fee Activity (Fund 102)

Description	2012 Actual	2013 Budget	2014 Proposed
Beginning Cash	433,775	613,705	750,000
Traffic Impact Fees	101,740	66,500	66,500
Grant Revenues	256,375	-	-
Misc Revenues	1,445	1,500	1,500
Total Revenues	359,560	68,000	68,000
Capital Projects / Transfers	179,631	3,800	50,000
Total Transfers	179,631	3,800	50,000
Ending Cash	613,705	677,905	768,000

Park Impact Fees

Park impact fees are imposed upon all new developments that generate new additional demand on city park facilities.

The park improvement fund accounts for revenues (including park impact fees) and expenditures associated with city park capital improvements. As of September 30, 2013 this fund had a balance of $152,642.

Per the Impact Fee revenue schedule, 2014 park impact fees are budgeted at approximately $19,300 which is based on the current park impact fee of $640.80 per equivalent residential unit (ERU) times an estimated thirty single-family residential permits in 2014.

Table 27 - Summary of Park Impact Fee Activity (Fund 104)

Description	2012 Actual	2013 Budget	2014 Proposed
Beginning Cash	89,488	98,687	100,000
Park Impact Fees	27,554	19,300	19,300
Grant Revenues	-	50,000	2,490,500
Misc Revenues	242	250	40,250
Transfers-In		120,000	120,000
Total Revenues	27,797	189,550	2,670,050
Capital Projects / Transfers	18,598	207,909	2,670,500
Total Transfers	18,598	207,909	2,670,500
Ending Cash	98,687	80,328	99,550

Fire Impact Fees

Fire impact fees are imposed upon all new developments that generate new additional demand on fire protection services.

The fire impact fund accounts for revenues (including fire impact fees) and expenditures associated with fire capital improvements and equipment. As of September 30, 2013 this fund had a balance of $25,180.

Per the Impact Fee revenue schedule, 2014 fire impact fees are budgeted at approximately $6,000 which is based on the current fire impact fee of $200.00 per equivalent residential unit (ERU) times an estimated thirty (30) single-family residential units.

Table 28 - Summary of Fire Impact Fee Activity (Fund 105)

Description	2012 Actual	2013 Budget	2014 Proposed
Beginning Cash	2,886	12,184	25,000
Fire Impact Fees	9,286	6,000	6,000
Misc Revenues	12	10	10
Total Revenues	9,298	6,010	6,010
Machinery & Equipment	-	-	25,000
Total Transfers	-	-	25,000
Ending Cash	12,184	18,194	6,010

Bond Proceeds

Description of Bond Proceeds

In 2011 the city issued $2,880,000 revenue bonds to finance certain water utility capital improvements as identified in the capital improvement plan. Bond proceeds of $2,734,682 (net of issuance costs) were deposited into the water construction fund, and have been expended as follows:

Table 29 - Summary of 2011 Revenue Bond Activity

Dscription	2011 Actual	2012 Actual	2013 Projected	2014 Proposed	12/31/2014 Total Proj.
PZ-1 297 Zone to 400 Zone	98,951	376,214	604	-	475,769
Bryant Well #3	-	-	53,049	-	53,049
F9 Hatt Slough Collection	482	-	100,482	-	100,965
Cedar Home Well	-	-	152,000	-	152,000
PZ-1 125 & 242 to 245	-	-	100,000	-	100,000
Bryant Well #2 Replacement	-	-	-	700,000	700,000
PZ-2	-	-	-	740,000	740,000
F11 Hatt Slough Rehab	-	-	-	255,000	255,000
					-
Totals	99,434	376,214	406,136	1,695,000	2,576,784
Revenue Bond Proceeds					(2,734,682)
Balance Remaining					157,898

As the table shows, all but $157,898 of the original bond proceeds are projected to be expended by the end of 2014.

Grants

The city expects to receive $3,143,000 in grant revenues as follows:

Table 30 - Budgeted Grant Revenues and Uses

Grant Description	Fund	2014 Budget	Project Description
WSDOT ARRA Grant	103	4,500	Wetland Mitigation
WSDOT SR 532 Beautification	103	58,000	WSDOT SR 532 Beautification
WSDOT Safe Routes	103	67,000	68th St Sidewalk
Dept of Commerce SRTS	103	183,000	68th St Sidewalk
Conservation Futures	104	156,000	Hamilton Property Purchase
Conservation Futures	104	2,334,500	Ovenell Property Purchase
Skagit County Soccer Assn	104	40,000	
Dept of Ecology	411	300,000	Irvine Slough Erosion Control
Totals		3,143,000	

City of Stanwood
Stormwater Comprehensive Plan
APPENDIX A.16
DRAINAGE CONCERNS SUMMARY

ID	Source	Address	Original Problem Location From Public Survey	Problem Description 1	Problem Description 2	Problem Description 3	Problem Description 4	Categorization of Problem 1	Categorization of Problem 2	Categorization of Problem 3	Categorization of Problem 4	Frequency of Problem 1	Frequency of Problem 2	Last Occurrence of Problem	Duration of Problem 1	Duration of Problem 2
1	City Staff	76th Dr NW & 272nd St NW		Backyards on 76th Dr. NW Flood from Water runoff from 272nd St NW. The water from the street on 272nd runs into backyard and forms a puddle; house on corner of 272nd and 76th.				Flooding								
2	City Staff	76th Dr NW & 276th St NW		Backyards on 76th Dr NW Flood During Heavy Rain. There are three to four houses that get flooded out in their backyards in heavy rain due to a hill from the school behind their house homeowners say it used to drain.				Flooding								
3	City Staff	268th St NW & Floe Rd		The dike is low in this area and needs to be built up, there are sand bags in place now. On a really high tide the water will spill over in this area next to the smoke stack need to build dike up.				Flooding								
4	City Staff	96th NW & 271 St NW		House on 96th next to the library, the yard floods during a flood event. When we have a flood the water in this area will not drain because Irvine Slough is backed up, so 2 houses next to library have their yards flooded.				Flooding								
5	City Staff	Lovers Rd/276th St NW		Lovers Lane 276th water ponds up on side of roadway across from Heritage Park on the north side of the road. Huge puddle forms into the roadway when it rains needs a catch basin.				Flooding								
6	City Staff	Pioneer Hwy & 85th Dr NW		Water runoff from the street in heavy rain events washes the shoulder of the roadway down the hill on 85th Dr NW into Pioneer Hwy. Water rushes the hill and washes out the shoulder of the road when it rains, need to add 1 or 2 catch basins.				Erosion								
17	City Staff	92nd Ave NW & 268th St NW		Seven Tubes - 1 gate is completely gone and needs to be replaced. All other 6 tubes need to be replaced due to hold in pipes and gates are old. We have seven flood gates, the hippes are old and have holes in them. One pipe is missing a flood gate and all gates are old.				Failed Infrastructure								
18	City Staff	90th Ave NW & 271 St NW		270th St drain pipe under roadway is collapsed. Drainage pipe that runs from a catch basin on the north to the south of 270th is collapsed under the roadway.				Failed Infrastructure								
19	City Staff	Lund Hill Rd & Nordic Way		Pioneer Hills south pond control structure is broke and is need of repair. Control structure in the pond has broken parts, the outlet pipe is separated, pipe supports are broken.				Failed Infrastructure								
20	NHC	268th ST NW & 1-4th Dr NW		Outfall from this Douglas Creek Outfall is limited.				Flooding				Every 1-2 Years		1/1/2014	Days To Weeks	
21	NHC	102nd Ave NW & 268th St NW		Irvine Slough pump station capacity is limited				Flooding				Every 1-2 Years		4/1/2013	Days To Weeks	
22	NHC	102nd Ave NW & 268th St NW		Risk of Flooding at WWTP				Flooding				Every 10-20 years		2009 or later	Days	
23	NHC	102nd Ave NW & 268th St NW		The sanitary sewer routes stormwater runoff from storms to WWTP.				Failed Infrastructure				Ongoing		Ongoing	Hours To Days	
24	NHC	92nd Ave NW & 268th St NW		Larsen Dam restricts drainage of flow from east side of 92nd Ave following Stillaguamish River floods				Flooding				Every 5 Years		2009 or later	Days	
25	NHC	88th Ave NW & 268th ST NW		Flow from Stillaguamish River can cross SR 532 and flood downtown Stanwood.				Flooding				> Every 10 Years		6/12/1905	Days	
26	NHC	88th Ave NW & Marine Dr		Flow from Stillaguamish River can flood park and ride				Flooding				Every 5 Years		2009 or later	Days	
27	NHC	92nd Ave NW & 271st SW		Adverse Slope Pipe near 92nd Ave				Failed Infrastructure				Every 1-2 Years		1/1/2014	Days To Weeks	
28	NHC	Lovers Rd & Lane Rd		Flooding limits agriculture				Flooding				Every 1-2 Years		1/1/2014	Days To Weeks	
29	NHC	Lovers Rd & 102nd Ave NW		Lover's Lane culvert grades and channel limit capacity				Failed Infrastructure				Every 1-2 Years		4/1/2013	Days To Weeks	
30	NHC	102nd Dr NW & 271 St NW		Aged stormwater pipes allow infiltration into the stormwater system				Failed Infrastructure				Ongoing		Ongoing	Ongoing	
31	NHC	Nordic Way & Pioneer Hwy		Pioneer Hills pond is not providing the designed level of flow control				Failed Infrastructure				Ongoing		Ongoing	Ongoing	
32	NHC	287th St NW & 72nd Dr NW		Kylie Park I detention pond is not providing the designed level of flow control				Failed Infrastructure				Ongoing		Ongoing	Ongoing	
33	WSDOT	SR 532 & 270th St Nw		"Pumps not keeping up" at Irvine Slough.				Failed Infrastructure				Other		Other	Other	
34	Survey	8622 270th St NW	downtown behind Viking Village and alongside the tracks across the tracks from Wolf Kill and by Herbs Diner	Standing water on roadway	Non-functioning storm drainage			Flooding	Standing Water			Ongoing			Days	
35	Survey	27616 84th Drive NW	27616 84th Drive NW	Water flowing onto private property from city street				Flooding	Standing Water			Every Time it Rains		1/9/2014	Days	
36	Survey	27813 80th Ave NW	27813 80th Ave NW	Non-functioning storm drainage				Standing Water				Annually		1/15/2013	Other	
37	Survey	271st St NW & 84th Ave NW	84TH NW just south of 271st	Standing water on roadway				Flooding	Standing Water			Every Time it Rains		1/8/2014	Days	
38	Survey	7720 Stauffer Rd	7720 StaufferRd	Water flowing onto private property from city street	Standing water on roadway	Other	NO storm drainage	Flooding	Standing Water	Hillside Erosion	Nearly flooded my garage in last storm.	Every Time it Rains	Near flooding not as much	1/13/2014	Other	How ever long the rains last
39	Survey	7710 Stauffer Rd	7710 Stauffer Rd	Water flowing onto private property from city street				Flooding				Every Time it Rains		1/9/2014	1-6 hours	
40	Survey	Pioneer Hwy & 86th Dr NW	South end of 86th Dr. just before entering Pioneer Hwy	Other			Water flowing across 86th Dr. and down to Pioneer Hwy.					Every Time it Rains			Other	It occurs during and after a moderate to light rain
41	Survey	278th Place NW	Summerset 278th Place NW	Other			City Water Tower property debris runs off onto roadway and into storm system and drainage pond (pond is owned by home owners)	Water Quality	Habitat	Hillside Erosion	City Property runoff debris unnecessarily puts debris in privately owned storm pond and creates additional maintenance and cost burdens on homeowners.	Ongoing	When it rains AND when city trucks (more than once a day) go to the water tower project - trucks bring debris from gravel/dirt road onto roadway. This debris gets in storm system.	41655	Other	Ongoing

City of Stanwood
Stormwater Comprehensive Plan
APPENDIX A.16
DRAINAGE CONCERNS SUMMARY

ID	Source	Address	Flood Depth 1	Flood Depth 2	Date Data Received	Impact of Reported Problem 1	Impact of Reported Problem 2	Impact of Reported Problem 3	Impact of Reported Problem 4	Impact of Reported Problem 5	Impact of Reported Problem 6	Safety Concern?	Description of Safety Concern	Additional Comments	Contact	PACE Notes
1	City Staff	76th Dr NW & 272nd St NW			1/14/2014										Trevor (City)	
2	City Staff	76th Dr NW & 276th St NW			1/14/2014										Trevor (City)	
3	City Staff	268th St NW & Floe Rd			1/14/2014										Trevor (City)	
4	City Staff	96th NW & 271 St NW			1/14/2014										Trevor (City)	
5	City Staff	Lovers Rd/276th St NW			1/14/2014										Trevor (City)	
6	City Staff	Pioneer Hwy & 85th Dr NW			1/14/2014										Trevor (City)	
17	City Staff	92nd Ave NW & 268th St NW			1/14/2014										Trevor (City)	
18	City Staff	90th Ave NW & 271 St NW			1/14/2014										Trevor (City)	
19	City Staff	Lund Hill Rd & Nordic Way			1/14/2014										Trevor (City)	
20	NHC	268th ST NW & 1-4th Dr NW	1 ft.		10/16/2013										Derek Stuart (NHC)	
21	NHC	102nd Ave NW & 268th St NW	3 ft.		10/16/2013										Derek Stuart (NHC)	
22	NHC	102nd Ave NW & 268th St NW	unknown		10/16/2013										Derek Stuart (NHC)	
23	NHC	102nd Ave NW & 268th St NW	Not Applicable		10/16/2013										Derek Stuart (NHC)	
24	NHC	92nd Ave NW & 268th St NW	3 ft.		10/16/2013										Derek Stuart (NHC)	
25	NHC	88th Ave NW & 268th ST NW	Other		10/16/2013										Derek Stuart (NHC)	
26	NHC	88th Ave NW & Marine Dr	3 ft.		10/16/2013										Derek Stuart (NHC)	
27	NHC	92nd Ave NW & 271st SW	1 ft.		10/16/2013										Derek Stuart (NHC)	
28	NHC	Lovers Rd & Lane Rd	1 ft.		10/16/2013										Derek Stuart (NHC)	
29	NHC	Lovers Rd & 102nd Ave NW	3 ft.		10/16/2013										Derek Stuart (NHC)	
30	NHC	102nd Dr NW & 271 St NW	Other		10/16/2013										Derek Stuart (NHC)	
31	NHC	Nordic Way & Pioneer Hwy	Other		10/16/2013										Derek Stuart (NHC)	
32	NHC	287th St NW & 72nd Dr NW	Other		10/16/2013										Derek Stuart (NHC)	
33	WSDOT	SR 532 & 270th St Nw	Other		1/23/2014										Kim Glass (WSDOT)	Correspondence with Kim Glass at WSDOT on 1/23/2014.
34	Survey	8622 270th St NW	1 - 6 inches		1/22/2014	Water over roadway	Water over sidewalk	Impacting vehicles	Impacting pedestrians			Yes				
35	Survey	27616 84th Drive NW	Other	Rained on 1/9 as of 1/14 there is 2 to 4 inches of standing water in back yard	1/22/2014	Flooding yards	Flooding homes					Yes	Water goes under garage floor to backyard, has come up around a metal pole to keep car from hitting gas furnace.	Ground is so waterlogged in spring in backyard on the north side area no one can mow lawn, mud is 4" to 5" deep. By the end of June it has dried out some.	Marilyn Stone	
36	Survey	27813 80th Ave NW	1 - 6 inches		1/22/2014	Flooding homes	Flooding homes					No			Rod Sundberg	Size of project - to be determined.
37	Survey	271st St NW & 84th Ave NW	1 - 6 inches		1/20/2014	Water over roadway	Impacting vehicles					Yes	Swerving to miss the water - splashing on windshields obscuring vision - brakes.		Ralph H. Nichols	Size of project - to be determined.
38	Survey	7720 Stauffer Rd	1 - 6 inches		1/18/2014	Water over roadway	Flooding yards					No			Doug Chandler	
39	Survey	7710 Stauffer Rd	1 - 6 inches		1/16/2014	Flooding yards	Flooding homes	Other			I live halfway down the hill, the water runs under my house to get to the bottom of the hill.	No		The holding pond by my house is a breeding ground for mosquitos.	Helene Watkins	This could be a private issue. Needs to be confirmed where water is coming from that floods these homes. Mosquitos issue at private pond?
40	Survey	Pioneer Hwy & 86th Dr NW	Other	Flowing	1/16/2014	Water over roadway	Impacting vehicles	Impacting pedestrians	Other		Impact w hen it freezes	Yes	When it freezes it would be difficult to stop w hen you are going down to Pioneer Hwy.		Charles R. (Bob) Hitz	
41	Survey	278th Place NW	Other	Debris based on rain and amount of vehicle traffic at the city water tower.	1/16/2014	Other					The drainage pond is privately owned and maintained. The debris from the city property AND the runoff should not go to the storm system on 278th PL NW since it goes to the privately owned pond. This debris decreases the life of the pond and will require residents to pay for servicing the pond and more frequent intervals.	No		The City should take over maintenance and ownership of ALL drainage ponds in the city limits. This will ensure uniformity and proper maintenance. Storm water ponds are the weak link in the system- privately maintained by novice home owners. Modest fees to defer the cost of the maintenance of the pond could be incorporated into existing drainage fees. Housing Developments bring revenue to local business and strengthen the local economy. Support the Stanwood residents and take over the drainage ponds.	Anthony Hardenbrook	Private Issue - Not rated.

City of Stanwood
Stormwater Comprehensive Plan
APPENDIX A.16
DRAINAGE CONCERNS SUMMARY

ID	Source	Address	Original Problem Location From Public Survey	Problem Description 1	Problem Description 2	Problem Description 3	Problem Description 4	Categorization of Problem 1	Categorization of Problem 2	Categorization of Problem 3	Categorization of Problem 4	Frequency of Problem 1	Frequency of Problem 2	Last Occurrence of Problem	Duration of Problem 1	Duration of Problem 2
42	Survey	27030 102nd Dr NW	27030 102nd Dr NW Stanwood WA 98292	Other			Yard floods during heavy rains.	Flooding	Standing Water			Every Time it Rains		1/13/2014	Days	
43	Survey	27008 90th Ave NW	See attached photo - 271st St NW to the North, SR532 South and from 92nd Ave NW to the West, to 88th Ave NW East.	Non-functioning storm drainage	Other		attached photo shows boundaries of the area w/no city stormwater hookup.	Flooding	Water Quality			Other			Other	
44	Survey	27334 Village Pl NW	Church Creek Estates Development	Other			1998 heard lots of frogs, now only silence. Frogs area a good indicator of environmental health	Habitat				Other			Other	
45	Survey	27327 76th Dr NW	27327 76th Dr NW	Non-functioning storm drainage	Other		Water from high school flooding backyards and under house, b.ball field & track under water	Standing Water	Other		Water drains under my house.	Annually			Days	
46	Survey	9332 271st Street NW	9332 271st Street NW	Non-functioning storm drainage	Other		Flooding from Town Center (QFC) property.	Flooding	Standing Water	Other	Health	Ongoing		1/9/2014	Days	
47	Survey	72nd Ave NW	72nd Ave	Water flowing onto private property from city street				Standing Water				Every Time it Rains		1/9/2014	Days	
48	Survey	272nd St NW & 81st Dr NW	At the corner of 81st Dr & 272nd	Standing water on roadway	Non-functioning storm drainage			Standing Water				Every Time it Rains		1/9/2014	24 hours	
50	Survey	8600 Cedarhome Drive	Marine Drive and 271st at the site of recently demolished Wolfkill Feed store	Standing water on roadway	Other	Rain water covers east side of Marine Dr, south of 272nd		Standing Water				Every Time it Rains		12/1/2013	Days	
51	Survey	27126 96th Ave NW	27126 96th Ave NW	Water flowing onto private property from city street	Standing water on roadway	Non-functioning storm drainage		Flooding	Standing Water	Habitat		Every Time it Rains		1/8/2014	Days	
52	Survey	26920 94TH Drive NW	26920 94TH Drive NW, Stanwood WA. 98292	Water flowing onto private property from city street	Standing water on roadway	Standing water on roadway		Flooding	Standing Water			Every Time it Rains		1/7/2014	Days	
53	Survey	27901 86th Drive NW	27901 86th Drive NW and the general neighborhood	Water flowing onto private property from city street	Non-functioning storm drainage		The draining system in this part of town has failed. Homes are being flooded. My property is filled with water every time it rains. Fortunately, my home is not flooded. My property is. Just come and look at the surface drainage on 86th Street and you will see what is happening.	Flooding	Hillside Erosion	Standing Water	Erosion is very slow . Fortunately, there has been no sliding. When that happens, if it happens, it should make for some interesting court cases.	Annually		1/7/2014	Days	
54	Survey	27832 85th Dr NW	27832 85th Dr NW	Water flowing onto private property from city street	Non-functioning storm drainage			Standing Water	Flooding	Failed Infrastructure		Every Time it Rains		1/7/2014	24 hours	
55	City Staff	Irvine Slough		Irvine Slough Electrical & Controls Rehab (no pump upgrades). Replacing the entire electrical and control panels				Failed Infrastructure								
56	City Staff	ISPS		ISPS New Pumps (two each)				Failed Infrastructure								
57	City Staff	Irvine Slough		Irvine Slough. Evaluate stormwater collection system on the north side of SR532 to augment or replace Irvine Slough as flood conveyance.				Flooding								
58	City Staff	85th Street		85th Street Drainage - Collect and convey runoff.				Flooding								
59	City Staff	Citywide		Miscellaneous drainage improvements.				Flooding								
60	City Staff	Citywide		Major maintenance, including Lindstrom pond at Haggens				Flooding								
61	City Staff	Citywide		Comp Plan City - land use, goals and policies, 20140 projected needs, CIP and funding strategies.				Not Applicable								
62	Survey	27218 103rd Dr NW	27218 103rd Dr NW	Standing water in property when it rains				Standing Water				Every Time it Rains		Ongoing		
63	Survey	9326 271st St NW	9326 271st St NW	Standing water in property when it rains				Standing Water				Every Time it Rains		Ongoing		
64	Modeling	271st, 102nd Ave.														
65	Modeling	10199 274th Pl NW														
66	Modeling	27108 103rd Dr NW														

City of Stanwood
Stormwater Comprehensive Plan
APPENDIX A.16
DRAINAGE CONCERNS SUMMARY

ID	Source	Address	Flood Depth 1	Flood Depth 2	Date Data Received	Impact of Reported Problem 1	Impact of Reported Problem 2	Impact of Reported Problem 3	Impact of Reported Problem 4	Impact of Reported Problem 5	Impact of Reported Problem 6	Safety Concern?	Description of Safety Concern	Additional Comments	Contact	PACE Notes
42	Survey	27030 102nd Dr NW	1 ft.		1/14/2014	Flooding yards	Other				Blocks both entrances to house	No		Our yard is a low spot in the neighborhood. Property has storm drain, but it is on the high side near street, so only during extensive flooding does the water drain out.	James Coleman	This could be a private issue. Needs to be confirmed where water is coming from that floods these homes.
43	Survey	27008 90th Ave NW			1/14/2014	Other					Inadequate (sic) cit(y) stormwater conveyance creating unnecessary need for retention ponds. No hookup available.	No			Bill Lenz	
44	Survey	27334 Village Pl NW			1/14/2014	Other					Habitats	No		Use environmental friendly. When spraying for weeds & blackberries. City killed a lot more environment than intended.		Habitat study may be needed. Problem is unknown.
45	Survey	27327 76th Dr NW	1 - 6 inches		1/13/2014	Flooding yards	Other				Floods 5 to 6 backyards	Yes	Not good for foundation, water under my house can cause black mold.		Carol E. Reed	This could be a private issue. Needs to be confirmed where water is coming from that floods these homes.
46	Survey	9332 271st Street NW	2 ft.		1/13/2014	Impacting pedestrians	Flooding homes	Other			Flooding foundation, bad smell, infections from water	Yes	Periodically pump water with portable sump pump and would get hand infection after every pumping episode.	The main issue is a failed water retention system at Stanwood town center: I put yellow dye in their system and my land turned yellow .	Terry Greer	
47	Survey	72nd Ave NW	1 - 6 inches		1/13/2014	Flooding yards	Other	It is flooding the field				No		Drain water from housing hope apts at 72nd & 276th should have been piped over to the storm drain on the east side of 72nd instead of into the ditch on west side.	Wallace Middleton	
48	Survey	272nd St NW & 81st Dr NW	1 - 6 inches		1/13/2014	Water over roadway	Impacting vehicles					No			Hendrick Husby	
50	Survey	8600 Cedarhome Drive	1 - 6 inches		1/10/2014	Water over roadway	Flooding yards					Yes	Cars frequently drive around the standing water or they hydroplane.		Thad Nelson	
51	Survey	27126 96th Ave NW	1 - 6 inches	Usually 1-6 during normal w et season, 2-3 feet during flood stages	1/8/2014	Water over roadway	Water over sidewalk	Flooding yards				Yes	When storm drain fails water is up to 3 feet in street and Library parking lot. It isn't obvious to drivers. It is also a hazard to pedestrians since the storm drain is under water with damaged pavement. It is also a concern with contaminated water.	The issue has increased steadily over the past 10 years and w e have not been able to find a viable w ay to reduce the flooding to our property.	Andy and Julie Johnson	
52	Survey	26920 94TH Drive NW	1 ft.		1/7/2014	Water over roadway	Water over sidewalk	Impacting vehicles	Impacting pedestrians	Flooding yards					Paul I. Kalmakoff	
53	Survey	27901 86th Drive NW	1 - 6 inches		1/7/2014							Yes	Trees fall down when the ground is saturated. We have lost several 50 year old trees that blow over when their feet are wet. It is a new and dangerous phenomena. (spelling is not my strong suit) My neighbor's basements have flooded. I have a crawl space. I have installed a sub pump. The crawl space used to be dry, unless the former owner did not tell the truth. That is not the case now. As I said elsewhere, 50 year old trees have died from the excessive water we are experiencing. I would imagine that the value of my property is going down, down, down. Want to buy it?	Two homes above me have flooded twice from this problem. The entire system has failed and it is no one's fault and apparently no one's concern. We are blessed with surface water from the entire subdivision. Just look at 86th street during and after rain and you will see the problem. It even runs across Pioneer Highway. Thanks for asking. What will be done about it? What can be done about it?	John J. Shaffer	
54	Survey	27832 85th Dr NW	1 - 6 inches		1/30/2014	Flooding homes	Flooding yards							All of the rain water accumulates across the street from us comes over the road and into our yard and down our driveway into our house.	Carol Covert	
55	City Staff	Irvine Slough			2/4/2014										Kevin Hushagen (City)	$245,000 Cost Estimate (2014 CIP Dollars)
56	City Staff	ISPS			2/4/2014										Kevin Hushagen (City)	$105K each to replace, $60K each to rehab. City to decide. Hold until 2015.
57	City Staff	Irvine Slough			2/4/2014										Kevin Hushagen (City)	$300,000 Cost Estimate (2014 CIP Dollars). Off-set by $300,000 Department of Commerce grant through the Nature Conservancy.
58	City Staff	85th Street			2/4/2014										Kevin Hushagen (City)	$30,000 Cost Estimate (2014 CIP Dollars)
59	City Staff	Citywide			2/4/2014										Kevin Hushagen (City)	$10,000 Cost Estimate (2014 CIP Dollars)
60	City Staff	Citywide			2/4/2014										Kevin Hushagen (City)	$25,000 Cost Estimate (2014 CIP Dollars)
61	City Staff	Citywide			2/4/2014										Kevin Hushagen (City)	$100,000 Cost Estimate (2014 CIP Dollars)
62	Survey	27218 103rd Dr NW	1 - 6 inches		2/25/2014	Flooding yards									Jan Williamson	
63	Survey	9326 271st St NW	1 - 6 inches		2/25/2014	Flooding yards										
64	Modeling	271st, 102nd Ave.														
65	Modeling	10199 274th Pl NW														
66	Modeling	27108 103rd Dr NW														

CITY OF STANWOOD

Stormwater Management Program Analysis

March 2014

PACE Engineers, Inc.

CITY OF STANWOOD

STORMWATER MANAGEMENT (SWM) PROGRAM ANALYSIS SUMMARY

MARCH 2014

	Existing SWM Program				Future SWM Program				Total Gap			
Stormwater Management Elements	Staff FTE	Staff Cost ($)	Expense Cost ($)	Total Cost ($)	Staff FTE	Staff Cost ($)	Expense Cost ($)	Total Cost ($)	Total Staff (FTE) Gap	Staff Gap in Expense Cost ($)	Total Gap in Expense Cost ($)	Total Cost ($) Gap
SWM Element #1 – Public Education and Outreach	0.00	$0	$0	$0	0.08	$8,021	$3,000	$11,021	0.08	$8,021	$3,000	$11,021
SWM Element #2 – Public Involvement and Participation	0.02	$1,744	$0	$1,744	0.05	$5,013	$2,500	$7,513	0.03	$3,270	$2,500	$5,770
SWM Element #3 – Illicit Discharge Detection and Elimination	0.02	$1,744	$0	$1,744	0.41	$41,109	$11,500	$52,609	0.39	$39,365	$11,500	$50,865
SWM Element #4 – Controlling Runoff from New Development, Redevelopment, and Construction S	0.07	$6,103	$0	$6,103	0.57	$57,152	$5,750	$62,902	0.50	$51,049	$5,750	$56,799
SWM Element #5 – Municipal Operations and Maintenance	1.57	$136,885	$42,500	$179,385	3.05	$305,812	$95,500	$401,312	1.48	$168,927	$53,000	$221,927
SWM Element #6 – Program Implementation	0.00	$0	$0	$0	0.07	$7,019	$1,000	$8,019	0.07	$7,019	$1,000	$8,019
SWM Element #7 – Total Maximum Daily Load Allocations: Stillaguamish River	0.00	$0	$0	$0	0.07	$7,019	$15,000	$22,019	0.07	$7,019	$15,000	$22,019
SWM Element #8 – Monitoring	0.00	$0	$0	$0	0.07	$7,019	$20,000	$27,019	0.07	$7,019	$20,000	$27,019
SWM Element #9 – Reporting	0.01	$872	$0	$872	0.05	$5,013	$0	$5,013	0.04	$4,141	$0	$4,141
NPDES Permit Cumulative Subtotal	**1.69**	**$147,348**	**$42,500**	**$189,848**	**4.42**	**$443,177**	**$154,250**	**$597,427**	**2.73**	**$295,829**	**$111,750**	**$407,579**
SWM Element #10 – Underground Injection Control Rule	0.00	$0	$0	$0	0.07	$7,019	$1,500	$8,519	0.07	$7,019	$1,500	$8,519
Other Stormwater Program Obligations Cumulative Subtotal	**1.69**	**$147,348**	**$42,500**	**$189,848**	**4.49**	**$450,195**	**$155,750**	**$605,945**	**2.80**	**$302,848**	**$113,250**	**$416,098**
SWM Element #11 – Stormwater Capital Improvement Program	0.14	$12,206	$710,000	$722,206	0.75	$75,200	$825,000	$900,200	0.61	$62,993	$115,000	$177,993
Stormwater Capital Improvement Program Cumulative Subtotal	**1.83**	**$159,554**	**$752,500**	**$912,054**	**5.24**	**$525,395**	**$980,750**	**$1,506,145**	**3.41**	**$365,841**	**$228,250**	**$594,091**
SWM Element #12 – Administrative and Additional Activities	0.26	$22,669	$313,557	$336,226	0.26	$26,069	$360,591	$386,660	0.00	$3,400	$47,034	$50,434
TOTAL	**2.09**	**$182,223**	**$1,066,057**	**$1,248,280**	**5.50**	**$551,464**	**$1,341,341**	**$1,892,805**	**3.41**	**$369,241**	**$275,284**	**$644,525**
GRAND TOTAL	$1,248,280				$1,892,805							
TOTAL GAP					(3.41)	($369,241)	($275,284)	($644,525)				

Requirements			City of Stanwood's Stormwater Program Analysis											
New Permit Section Reference or Other Reference	**Stormwater Program Element**	**Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)**	**Current Activities**	**Source of Information**	**Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)***	**Existing Staff Cost ($)**	**Existing Expenses ($)**	**Total Existing Program Costs**	**Future Activities *(in addition to Current/ Previously Completed Activities)***	**Future Staff FTE**	**Future Staff Cost ($)**	**Future Total Expense ($)**	**Total Future Program Costs**	**Comments**
SWM Element #1 – Public Education and Outreach														
S5.C.1.a and b	**1.1 Outreach to Target Audiences**	Begin implementing or participating in an education and outreach program. Prioritize target audiences and subject areas: -General Public about stormwater basics; -Businesses about chemical use/storage and illicit discharges; -Homeowners/Landscapers/Property Managers about yard care, fertilizers, carpet cleaning, auto maintenance, LID and pond maintenance; -Development Community about flow control, stormwater treatment, LID, and erosion control. -Focus education and outreach efforts on prioritized target audiences, including school- aged children and home-based/mobile businesses. -General public and business education program should include the subject area for impacts of illicit discharges and how to report them, Low Impact Development (LID) principles and LID Best Management Practices (BMPs), prevention of illicit discharges, and stewardship activities. -Residents, landscapers, and property manager/owners' education program should include LID principles and BMPs, vehicle, equipment and home/building maintenance, stormwater facility maintenance, and dumpster and trash compactor maintenance. -Engineers, contractors, developers, and land use planners education program should include technical standards for stormwater site and erosion control plans, LID principles and LID BMPs, and stormwater treatment and flow control BMPs/facilities. -Create a stewardship opportunity and/or build on existing organizations to encourage residents to participate in activities.	The City has no established public education and outreach program.	City Staff Questionnaire (March 2014)					Develop and implement a public education and outreach program toward prioritized target audiences. Create stewardship opportunities and/or build on existing organizations to encourage organizations to encourage residents to participate in activities. (See requirements column for more detail).	0.05	$5,013	$2,000	$7,013	
S5.C.1.c	**1.2 Measure Results of the Educational Activities**	Begin participating in an effort to measure understanding and adoption of the targeted behaviors for at least one targeted audience in at least one subject area. Public education requirements for measuring behaviors and implementing programs can be done locally or as a member of a regional group. Permittees shall begin measuring the understanding and adoption of the targeted behaviors for at least one new targeted audience in at least one new subject area. Permittee shall use the resulting measurements to direct education and outreach resources most effectively, as well as to evaluate changes in adoption of the targeted behaviors. Permittees may meet this requirement individually or as a member of a regional group.	No existing program in place.	City Staff Questionnaire (March 2014)					Develop and implement a program to measure the results of the effectiveness the City's public education and outreach activities.	0.02	$2,005	$500	$2,505	
N/A	**1.3 Maintain Records**	Track and maintain records of public education and outreach activities. (No requirements on tracking and maintaining public education and outreach activities are listed in this section of the New Permit.)	No existing program in place.	City Staff Questionnaire (March 2014)					Track and maintain records for public education and outreach activities.	0.01	$1,003	$500	$1,503	
Total – Element #1					**0.00**	**$0**	**$0**	**$0**		**0.08**	**$8,021**	**$3,000**	**$11,021**	The existing FTE allocates 0.02 FTE of administrative support time to participate in public education and outreach activities related to stormwater.
Total GAP in Element #1										**(0.08)**	**($8,021)**	**($3,000)**	**($11,021)**	This line item shows the "gap" or difference between the existing allocated FTE and expenses and the FTE and expenses needed to fully implement the future program.

New Permit Section Reference or Other Reference	Stormwater Program Element	Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)	Current Activities	Source of Information	Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)*	Existing Staff Cost ($)	Existing Expenses ($)	Total Existing Program Costs	Future Activities *(in addition to Current/ Previously Completed Activities)*	Future Staff FTE	Future Staff Cost ($)	Future Total Expense ($)	Total Future Program Costs	Comments
SWM Element #2 – Public Involvement and Participation														
S5.A.2	**2.1 Input to SWMP Plan and Annual Report**	Organize the SWM Plan Components in S5.C and update this document at least once a year for submittal with the Annual Report. The SWM Plan should be written to inform the public of the planned SWM Plan activities for the next calendar year.	The City has held public meetings around the ownership and maintenance of stormwater retention/detention ponds. They have also held meetings regarding the potential installation of a trail/path/berm on SR532 that mostly drew concerns about flood water levels in the valley.	City Staff Questionnaire (March 2014)					Develop and an annual SWM Plan to document the planned activities for the Stormwater Program each year, that includes a written description of internal coordination mechanisms regarding stormwater related issues. Create ongoing opportunities for public involvement and outreach regarding the stormwater program.	0.05	$5,013	$2,500	$7,513	
S5.A.5.b		Provide a written description of internal coordination mechanisms in the Annual Report showing the coordination mechanisms among departments within each jurisdiction to eliminate barriers to compliance with the terms of the new Permit.												
S5.C.2.a		Create ongoing opportunities for public to participate in decision-making processes involving the development, implementation and update of the SWMP. Create opportunities through advisory councils, watershed committees, participation in developing rate structures, stewardship programs, environmental activities or other similar activities. Create ongoing opportunities for public involvement and participation through advisory councils, public hearings, watershed committees, participation in developing rate structures or other similar activities.												
S5.C.2.b	**2.2 Availability of Stormwater Program Documents**	Make the SWM Plan and the Annual Report available to the public by posting on the City Website. The Annual Report and SWM Plan must be posted on the jurisdiction's website no later than May 31 each year.	The City's website is the main venue for sharing information on the City's Stormwater Program, however, the City also sends out informational fliers and mailings on specific issues, as needed.	City Staff Questionnaire (March 2014)					Continue to keep the City's website up to date on current Stormwater Program elements. Make the SWM Plan available on the City's website.					
Total – Element #2					**0.02**	**$1,744**	**$0**	**$1,744**		**0.05**	**$5,013**	**$2,500**	**$7,513**	The existing FTE allocates 0.02 FTE of Administrative Support time to participate in public involvement and participation activities related to stormwater.
Total GAP in Element #2										**(0.03)**	**($3,270)**	**($2,500)**	**($5,770)**	This line item shows the "gap" or difference between the existing allocated FTE and expenses and the FTE and expenses needed to fully implement the future program.

New Permit Section Reference or Other Reference	Stormwater Program Element	Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)	Current Activities	Source of Information	Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)*	Existing Staff Cost ($)	Existing Expenses ($)	Total Existing Program Costs	Future Activities *(in addition to Current/ Previously Completed Activities)*	Future Staff FTE	Future Staff Cost ($)	Future Total Expense ($)	Total Future Program Costs	Comments
SWM Element #3 – Illicit Discharge Detection and Elimination														
S5.C.3.a	**3.1 Storm Sewer System Map**	Develop a municipal storm sewer system map of: -All storm sewer outfalls (including tributary areas and land use); -Receiving waters; -Structural stormwater facilities; -Connection points authorized during permit term; -Areas not draining to surface water. -Stormwater treatment and flow control BMPs/facilities and receiving waters other then ground water must be mapped. -Known MS4 Outfalls. -The City may rely on permanent stormwater controls plans for mapping of LID BMPs. -Tributary conveyances for all known outfalls with a 24-inch nominal diameter or larger. The following attributes must be mapped: tributary conveyances (type, materials, size where known), associated drainage areas, and land use. - Mapping must include all connections to the MS4.	The City has a stormwater system network map in CAD and GIS (last updated January 2014).	City Staff Questionnaire (March 2014)					Ensure the City's stormwater system network map is in compliance with the requirements of the Permit. Keep network map up to date.	0.15	$15,040	$3,000	$18,040	
S5.C.3.b	**3.2 Illicit Discharge Ordinance**	Develop and implement an ordinance prohibiting non-stormwater discharge to the MS4. The ordinance should cover: -Potable water flushing; -Lawn and landscape irrigation runoff; -Swimming pool discharges; -Street and sidewalk wash water; -Other non-stormwater discharge. Include enforcement procedures in the ordinance and develop an enforcement strategy. - Update IDDE ordinance to include uncontaminated water from crawl space pumps and a new conditional discharge: Spa and Hot Tub Discharges. All spa and hot tub discharges shall be thermally controlled to prevent an increase in temperature in receiving waters. -Update the IDDE Ordinance as needed to meet all new requirements in the Permit including effectively prohibit non-stormwater illegal discharges and/or dumping into the City's MS4. The ordinance shall include the elements required in the Permit.	No existing program in place.						Develop and adopt an IDDE Ordinance per the requirements of the Permit.	0.02	$2,005	$0	$2,005	
S5.C.3 & S5.C.3.c	**3.3 Detection and Elimination Program**	Develop and implement program to detect and address non-stormwater discharges, including spills and illicit connections. Implement a compliance strategy that includes informal compliance actions such as public education and technical assistance. Implement an effective compliance strategy, the Permittee's ordinance or other regulatory mechanism may need to include the following: Source Control BMPs applications to prevent illicit discharges and the maintenance of stormwater facilities. Implement an ongoing program designed to identify and detect non-stormwater discharges and illicit discharges and illicit connections into the Permittee's MS4.	The City responds to illicit discharges and spills as reported to the City or observed by staff.	City Staff Questionnaire (March 2014)					Develop and implement an IDDE Program per the requirements of the Permit.	0.10	$10,027	$0	$10,027	
		Develop procedures for: -Locating priority areas based on land use, previous complaints, and storage practices; -Field assessment during dry weather of outfalls in 3 priority receiving waters; Once a problem is reported or identified: -Characterizing nature and potential threat of illicit discharges; -Tracing the source of illicit discharge; -Notifying property owners; -Removing the source and conducting follow-up inspections.	No existing program in place.						Develop procedures for IDDE field assessments per the requirements of the Permit.					
		The City's IDDE compliance strategy should include the applicable operational and/or structural source control BMPs for pollutant generating sources associated with existing land uses and activities. -The strategy shall also include maintenance of permanent stormwater treatment facilities and catch basins. IDDE Program implementation and procedures shall include: 1) Develop procedures for conducting investigations for the purpose of detecting illicit discharges.												

New Permit Section Reference or Other Reference	Stormwater Program Element	Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)	Current Activities	Source of Information	Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)*	Existing Staff Cost ($)	Existing Expenses ($)	Total Existing Program Costs	Future Activities *(in addition to Current/ Previously Completed Activities)*	Future Staff FTE	Future Staff Cost ($)	Future Total Expense ($)	Total Future Program Costs	Comments
		Field Assessments of three high priority receiving waters. Complete field screenings of at least 40% of the City's conveyances and outfalls.	No existing program in place.						Conduct field screenings of three high priority receiving waters within the City and complete field screenings of at least 40% of the City's conveyance system and outfalls on an annual basis.	0.10	$10,027	$5,000	$15,027	
		Field Assessments of at least one high priority receiving water. Implement a field screening methodology appropriate to the characteristics of the MS4 and water quality concerns. Complete field screenings for at least 40% of the MS4 no later than December 31, 2017 and 12% each year thereafter.	No existing program in place.						Field Assessments of at least one high priority receiving water. Deveop and implement a field screening methodology appropriate to the characteristics of the MS4 and water quality concerns. Complete field screenings for at least 40% of the MS4 no later than 3 years into the Permit and 12% each year thereafter.					40% of the MS4 is loosely defined by Ecology. The City has the flexibility to define how to measure this. –Examples include total length of pipe, total drainage area, number of stormwater structures, etc.
		Characterization, source tracing (includes visual inspections, and when necessary opening manholes, using mobile cameras, collecting and analyzing water samples, and/or other detailed inspection procedures) and removal.	No existing program in place.						Characterization, source tracing, and removal.					
		Initiate an investigation within 21 days of any reported or discovery of a suspected illicit connection. Immediately respond to all illicit discharges, including spills which are determined to constitute a threat to human health, welfare or the environment. Investigate (or refer to the appropriate agency) within 7 days. All known illicit connections to MS4 shall be eliminated.	No existing program in place.						Initiate an investigation within 21 days of any reported or discovery of a suspected illicit connection. Immediately respond to all illicit discharges, including spills which are determined to constitute a threat to human health, welfare or the environment. Investigate (or refer to the appropriate agency) within 7 days. All known illicit connections to MS4 must be eliminated.					
S5.C.3.d	**3.4 Public Education and Spill Reporting**	Inform public employees, businesses, and general public of hazards associated with illegal discharges. Publicize a hotline for public reporting of spills and illicit discharges. Keep records of calls and follow-up actions taken. Include the new IDDE Response/Follow-Up Timeline in the new IDDE procedures.	The City currently reports spills generated by the City, primarily dealing with the City's wastewater department. Spill response is not a major issue for the City as a result of code enforcement.	City Staff Questionnaire (March 2014)					Conduct internal and public education on IDDE; establish and publicize an IDDE hotline, and perform spill and IDDE response to Ecology.	0.01	$1,003	$1,000	$2,003	
S5.C.3.e	**3.5 Program Evaluation and Tracking**	Track number and type of illicit discharges, including spills, identified and inspections made. Track feedback from public education efforts.	No existing program in place.						Track number and type of illicit discharges and track feedback from IDDE public education efforts.	0.01	$1,003	$0.00	$1,002.66	
S5.C.3.e	**3.6 Staff Training**	Train responsible staff on illicit discharge identification, investigation, clean-up, and reporting. All municipal staff who, as part of their normal job responsibilities, might come in contact with or otherwise observe an illicit discharge and/or illicit connection to the MS4, must be trained one time on the identification of illicit discharges and/or connections, and on the proper procedures for reporting and responding. Ongoing training for all municipal field staff and other appropriate staff on identification and reporting. Follow-up training should be provided on an as needed basis to address changes in the City's procedures, techniques, requirements and/or staffing. Document and maintain records of training.	No existing program in place.						Train staff responsible for the IDDE program. Document and maintain records of IDDE trainings.	0.02	$2,005	$2,500	$4,505	
	Total – Element #3				**0.02**	**$1,744**	**$0**	**$1,744**		**0.41**	**$41,109**	**$11,500**	**$52,609**	The existing 0.02 FTE represents a portion of 5 O&M Staff members working on stormwater to do spill and IDDE response.
	Total GAP in Element #3									**(0.39)**	**($39,365)**	**($11,500)**	**($50,865)**	This line item shows the "gap" or difference between the existing allocated FTE and expenses and the FTE and expenses needed to fully implement the future program.

New Permit Section Reference or Other Reference	Stormwater Program Element	Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)	Current Activities	Source of Information	Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)*	Existing Staff Cost ($)	Existing Expenses ($)	Total Existing Program Costs	Future Activities *(in addition to Current/ Previously Completed Activities)*	Future Staff FTE	Future Staff Cost ($)	Future Total Expense ($)	Total Future Program Costs	Comments
SWM Element #4 – Controlling Runoff from New Development, Redevelopment, and Construction Sites														
S5.C.4.a	**4.1 Stormwater Runoff Control Ordinance**	Adopt an ordinance to address runoff from new development, redevelopment, and construction site projects. The ordinance should include: -Minimum technical requirements equivalent to the 2012 Ecology Manual; -Legal authority for inspection of private facilities; -Provisions to require LID techniques (See Element 4.7).	The City has adopted the 2005 Ecology Manual.	City Staff Interviews (2014)					Adopt an ordinance to address runoff from new development, redevelopment, and construction site projects. The ordinance should include: -Minimum technical requirements equivalent to the 2012 Ecology Manual; -Legal authority for inspection of private facilities; -Provisions to require LID techniques (See Element 4.7).	0.03	$3,008	$0	$3,008	Note: Community Development and Code Enforcement staff are paid for out of the General Fund.
		The City's site plan process, BMP selection, and design criteria must meet the 2012 Ecology Manual requirements OR follow a program approved by Ecology under the 2013 Phase I Permit. The one-acre threshold was eliminated; thresholds include replaced hard surfaces; Onsite Stormwater Management (LID) standards. and LID Code-related requirements: All codes, rules, standards, and other enforceable documents must be reviewed and revised to incorporate and require LID principles and LID BMPs. The City must conduct and review the revision process and report the results to Ecology. LID amendments must include: measures to minimize impervious surfaces, measures to minimize loss of native vegetation, and measures to minimize stormwater runoff.	Permitting is done through the City's Community Development Department and plan review is done both in-house and through the City's contracted City Engineer.	City Staff Questionnaire (March 2014)					Continue permitting and plan review programs currently in place. The City's site plan process, BMP selection, and design criteria must meet the 2012 Ecology Manual requirements OR follow a program approved by Ecology under the 2013 Phase I Permit. The one-acre threshold was eliminated; thresholds include replaced hard surfaces; Onsite Stormwater Management (LID) standards, and LID Code-related requirements: All codes, rules, standards, and other enforceable documents must be reviewed and revised to incorporate and require LID principles and LID BMPs. The City must conduct and review the revision process and report the results to Ecology. LID amendments must include: measures to minimize impervious surfaces, measures to minimize loss of native vegetation, and measures to minimize stormwater runoff.					
S5.C.4.b	**4.2 Site Plan Review and Inspection**	Develop a permitting process with plan review, inspection, and enforcement for public and private projects that disturb one acre of land or greater. -Review all stormwater site plans; -Inspect high risk sites prior to clearing and construction; -Inspect all sites during and after construction; Verify all sites have a maintenance plan in place and maintenance responsibility has been assigned; -Implement an enforcement strategy. -Compliance = 80% of scheduled inspections. -Develop a permitting process with plan review, inspection, and enforcement to ensure that the ordinance guidelines meeting the 2012 Ecology Manual requirements.	Permitting is done through the City's Community Development Department and plan review is done both in-house and through the City's contracted City Engineer.	City Staff Questionnaire (March 2014)					Continue to implement the City's permitting and plan review process. Ensure that the permitting process and plan review meet all the requirements of the Permit.	0.20	$20,053	$0	$20,053	Note: Permit fees, including site development permit fees, fund the on-call engineer to conduct plan review and the contractor to complete inspections as needed.
S5.C.4.c	**4.3 Long Term Operation and Maintenance**	Adopt an ordinance requiring inspection and maintenance of stormwater facilities and establishing enforcement procedures. The City is required to have the legal authority to inspect and enforce the maintenance standards for all private stormwater facilities.	The City is working on developing a program regarding private facility maintenance and ownership. Currently, the City weeds and does debris removal (trees, brush, shrubs) at all private detention and retention ponds, even if still owned by a private party.	City Staff Questionnaire (March 2014)	See Element 12.3	See Element 12.3	See Element 12.3		Develop and private facility inspection and maintenance program that is codified in the Stanwood Municipal Code. Ensure the City has the legal authority to inspect and enforce the maintenance standards for all private stormwater facilities.	0.15	$15,040	$2,500	$17,540	
		Adopt maintenance standards for facilities consistent with the 2012 Ecology Manual. Include provisions to verify long term maintenance for stormwater treatment and flow control BMPs/facilities permitted and constructed pursuant to S5.C.4.b.	The City has adopted the 2005 Ecology Manual.	City Staff Questionnaire (March 2014)					Adopt maintenance standards consistent with the 2012 Ecology Manual, including provisions for long term maintenance, for stormwater treatment and flow control BMPs/facilities within the City.					
		Inspect new treatment and flow control facilities annually. Inspect all new stormwater treatment and flow control BMPs/facilities and catch basins for permanent residential developments every 6 months until 90% of lots are constructed to identify maintenance needs and enforce compliance of maintenance standards. Inspection compliance is achieved by conducting at least 80% of scheduled inspections.	Inspections are currently being contracted out through the City's on-call City engineer and a Larsen Construction. Community Development is largely responsible for this process with any runoff or other issues being reported to code enforcement and Community Development. Public Works does conduct plan review and also receives complaints and concerns and makes field observations. Public Works works closely with the inspectors.	City Staff Questionnaire (March 2014)					Continue conducting current inspection program. Ensure the program inspects new treatment and flow control facilities annually and all new stormwater treatment and flow control BMPs/facilities and catch basins for permanent residential developments every 6 months until 90% of lots are constructed to identify maintenance needs and enforce compliance of maintenance standards.					
		For new residential developments that are part of a larger common plan of development, inspect new water quality and flow control facilities every six months during building construction.							For new residential developments that are part of a larger common plan of development, inspect new water quality and flow control facilities every six months during building construction.					

New Permit Section Reference or Other Reference	Stormwater Program Element	Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)	Current Activities	Source of Information	Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)*	Existing Staff Cost ($)	Existing Expenses ($)	Total Existing Program Costs	Future Activities *(in addition to Current/ Previously Completed Activities)*	Future Staff FTE	Future Staff Cost ($)	Future Total Expense ($)	Total Future Program Costs	Comments
S5.C.4.c	**4.4. Permit Tracking and Inspection Records**	Keep records of all inspections, enforcement actions, maintenance activities, and construction sites. Implement a procedure for keeping records of inspections and enforcement actions, including inspection reports, warning letters, notices of violations, other enforcement records, maintenance inspections, and maintenance activities.	Copies of inspection reports are kept both at Community Development, Public Works and with code enforcement.	City Staff Questionnaire (March 2014)					Continue to keep copies of inspection reports are kept both at Community Development, Public Works and with code enforcement. Ensure all records are kept for all inspections, enforcement actions, maintenance activities, and construction sites. Ensure there is a procedures to keep records of inspections and enforcement actions, including inspection reports, warning letters, notices of violations, other enforcement records, maintenance inspections, and maintenance activities that meet the requirements of the Permit.	0.02	$2,005	$500	$2,505	
S5.C.4.d	**4.5 NOI for Construction Activity**	Make copies of the "Notice of Intent for Construction Activity" and/or "Notice of Intent for Industrial Activity" available to developers.	No existing program in place.						Make copies of the "Notice of Intent for Construction Activity" and/or "Notice of Intent for Industrial Activity" available to developers at the Front Desk at City Hall.	0.01	$1,003	$250	$1,252.66	A copy of the NOI can be found on Ecology's Website: **https://fortress.wa.gov/ecy/publications/publications/ecy02085.pdf**
S5.C.4.e	**4.6 Staff Training**	Conduct training for staff in permitting, plan review, construction site inspection, and enforcement concerning the Stormwater Runoff Control program (Element 4.1). Document and maintain records of training. Conduct follow-up training for staff as needed to address changes in procedures, techniques, or staffing.	One City staff member has a CESCL certification.	City Staff Questionnaire (March 2014)					Conduct training for all Public Works and inspection staff in permitting, plan review, construction site inspection, and enforcement concerning the Stormwater Runoff Control program (Element 4.1). Document and maintain records of training. Conduct follow-up training for staff as needed to address changes in procedures, techniques, or staffing.	0.03	$3,008	$2,500	$5,508	
S5.4.f	**4.7 LID Code**	Review, revise, and make effective the City's code on local development-related codes, standards, etc., to incorporate and require LID principles and LID BMPs. A summary of the City's review and revision of code, standards, etc., will need to be written and submitted with the City's Annual report due March 31 each year. The summary shall be organized by a) Measures to minimize impervious surfaces, b) Measures to minimize loss of native vegetation; and c) Other measures to minimize stormwater runoff.	No existing code in place.	City Staff Questionnaire (March 2014)					Develop and implement LID Code into the Stanwood Municipal Code.	0.08	$8,021	$0	$8,021	
S5.4.g	**4.8 Watershed-Scale Stormwater Planning**	The City may participate with the Snohomish County for watershed-scale stormwater planning to participate in.	City Staff participate in watershed scale planning with the Stillaguamish Watershed Council.	City Staff Interviews (2014)					Continue to participate in watershed planning through the Stillaguamish Watershed Council and other watershed planning being conducted by Snohomish County that may overlap with the City's drainage basins.	0.05	$5,013	$0	5013	
Total – Element #4					**0.07**	**$6,103**	**$0**	**$6,103**		**0.57**	**$57,152**	**$5,750**	**$62,902**	The existing 0.05 FTE represents a portion of 5 O&M Staff members working on stormwater and 0.02 FTE for the Public Works Director.
Total GAP in Element #4										**(0.50)**	**($51,049)**	**($5,750)**	**($56,799)**	This line item shows the "gap" or difference between the existing allocated FTE and expenses and the FTE and expenses needed to fully implement the future program.

New Permit Section Reference or Other Reference	Stormwater Program Element	Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)	Current Activities	Source of Information	Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)*	Existing Staff Cost ($)	Existing Expenses ($)	Total Existing Program Costs	Future Activities *(in addition to Current/ Previously Completed Activities)*	Future Staff FTE	Future Staff Cost ($)	Future Total Expense ($)	Total Future Program Costs	Comments
SWM Element #5 – Municipal Operations and Maintenance														
S5.C.5.a	**5.1 Adopt Maintenance Standards**	Adopt maintenance standards consistent with the 2012 Ecology Manual.	The City has adopted the 2005 Ecology Manual; however, the City has no existing O&M Plan.	City Staff Interviews (2014)					Adopt maintenance standards consistent with the 2012 Manual and development/implement Stormwater O&M Standards.	0.10	$10,027	$0	$10,027	
S5.C.5.b	**5.2 Annual Inspections of Water Quality and Flow Control Facilities**	Conduct annual inspections of City owned stormwater treatment and flow control facilities; Perform necessary maintenance actions in accordance with the new maintenance standards adopted in Element 5.1. Compliance = 95% of scheduled annual inspections.	City structures, such as tide gates are inspected at least twice annually. Some other areas are inspected during heavy rains. All catch basins and lines are cleaned and inspected at least once every 2 years by an outside contractor.	City Staff Questionnaire (March 2014)					Conduct annual inspections of City owned stormwater treatment and flow control facilities; Perform necessary maintenance actions in accordance with the new maintenance standards adopted in Element 5.1. Compliance = 95% of scheduled annual inspections.	0.75	$75,200	$25,000	$100,200	
S5.C.5.c	**5.3 Spot Checks after Storm Events**	Spot check stormwater treatment and flow control facilities after major storm events (>10-year recurrence interval) (24-hour storm event with a 10-year or greater recurrence interval); Conduct repairs as necessary. Spot checks after all storm events are required for permanent stormwater treatment and flow control BMPs/facilities.	No existing program in place.						Spot check stormwater treatment and flow control facilities after major storm events (>10-year recurrence interval) (24-hour storm event with a 10-year or greater recurrence interval); Conduct repairs as necessary. Spot checks after all storm events are required for permanent stormwater treatment and flow control BMPs/facilities.	0.40	$40,106	$15,000	$55,106	
S5.C.5.d	**5.4 Catch Basin Inspection**	Inspect all catch basins and inlets at least once during the permit term; Clean catch basins as necessary; Dispose of decant water appropriately. Inspect all catch basins and inlets owned or operated by the City, and every two years thereafter. This schedule of all catch basins and inlets to be inspected every two years may be changed as appropriate to meet the maintenance standards based on maintenance records of double the length of time of the proposed inspection frequency. Inspections every two years thereafter may be conducted on a "circuit basis" whereby 25% of catch basins and inlets within each circuit are inspected to identify maintenance needs.	See Element 5.2.						Inspect all catch basins and inlets at least once during the permit term; Clean catch basins as necessary; Dispose of decant water appropriately. Inspect all catch basins and inlets owned or operated by the City, and every two years thereafter. This schedule of all catch basins and inlets to be inspected every two years may be changed as appropriate to meet the maintenance standards based on maintenance records of double the length of time of the proposed inspection frequency. Inspections every two years thereafter may be conducted on a "circuit basis" whereby 25% of catch basins and inlets within each circuit are inspected to identify maintenance needs.	0.75	$75,200	$15,000	$90,200	Future local decant facility may be required.
S5.C.5.f	**5.5 Road Maintenance/Non-Roadway Maintenance**	Implement practices, policies, and procedures to reduce stormwater impacts from all lands. Lands owned or maintained by the Permittee including, but are not limited to, streets, parking lots, roads, highways, buildings, parks, open space, road rights-of-way, maintenance yards, and stormwater treatment and flow control BMPs/facilities. Address the following activities: -Pipe and culvert cleaning; -Ditch and roadside vegetation management; -Street cleaning; -Street repair, resurfacing, and striping; -Snow and ice control; -Utility installation; -Dust control - Application of fertilizers, pesticides, and herbicides according to the instructions for their use, including reducing nutrients and pesticides using alternatives that minimize environmental impacts; - Sediment and erosion control; - Landscape maintenance and vegetation disposal; - Trash and pet waste management; - Building exterior cleaning and maintenance. The City may clean the entire MS4 within a circuit once during the Permit term. The system must be cleaned once during the Permit term.	The City has an Interlocal Agreement with Snohomish County, for maintenance work that has primarily been for pavements and roadway markings. The City is considering an ILA for pond maintenance and ditch cleaning.	City Staff Questionnaire (March 2014)					Implement practices, policies, and procedures to reduce stormwater impacts from all lands. Lands owned or maintained by the City including, but are not limited to, streets, parking lots, roads, highways, buildings, parks, open space, road rights-of-way, maintenance yards, and stormwater treatment and flow control BMPs/facilities. Address all the activities required by the Permit. The City shall clean the entire MS4 circuit once during the Permit term.	0.75	$75,200	$30,000	$105,200	

New Permit Section Reference or Other Reference	Stormwater Program Element	Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)	Current Activities	Source of Information	Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)*	Existing Staff Cost ($)	Existing Expenses ($)	Total Existing Program Costs	Future Activities *(in addition to Current/ Previously Completed Activities)*	Future Staff FTE	Future Staff Cost ($)	Future Total Expense ($)	Total Future Program Costs	Comments
S5.C.5.g	**5.7 Staff Training**	Implement ongoing training activities for staff whose primary construction, operation, or maintenance job functions may impact stormwater. Include training on: -O&M standards; -Inspection procedures; -Selecting appropriate BMPs; -Reducing water quality impact in daily activities; -Reporting of water quality concerns and illicit discharges. Document and maintain records of training.	Public Works staff has been trained on operation or the City's sweeper and vactor equipment. There has been no training of O&M staff on detention/retention pond maintenance and Best Management Practices.	City Staff Questionnaire (March 2014)					Implement training activities for all O&M staff and other applicable City staff whose primary construction, operation, or maintenance job functions may impact stormwater. Include training on: -O&M standards; -Inspection procedures; -Selecting appropriate BMPs; -Reducing water quality impact in daily activities; -Reporting of water quality concerns and illicit discharges. Document and maintain records of training.	0.10	$10,027	$5,000	$15,027	
S5.C.5.h	**5.8 SWPPP for Maintenance Yards**	Develop and implement Stormwater Pollution Prevention Plans (SWPPP) for all equipment maintenance and storage yards not covered under the Industrial Stormwater General Permit. Include an implementation schedule for structural BMPs and conduct occasional visual inspection of discharge from the site.	The City's Public Works/Maintenance Yard does not currently have a SWPPP document.	City Staff Questionnaire (March 2014)					Develop and implement a SWPPP document for the Public Works/Maintenance Yard.	0.15	$15,040	$5,000	$20,040	
S5.C.5.i	**5.9 Record Keeping**	Maintain records of inspection and/or repair activities.	The Public Works Department uses IWORQ's work order system.	City Staff Questionnaire (March 2014)					Maintain records of all O&M activities using IWORQ.	0.05	$5,013	$500	$5,513	
Total – Element #5					**1.57**	**$136,885**	**$42,500**	**$179,385**		**3.05**	**$305,812**	**$95,500**	**$401,312**	The existing 1.39 FTE represents a portion of 5 O&M Staff members working on stormwater, one of which is seasonal, 0.01 FTE for Administrative Support, 0.11 FTE for the Supervisor, and 0.03 FTE for the Public Works Director. The 2014 Stormwater Program expense dollars allocated in this element include Fuel ($1,500), Small Equipment ($1,000), Rentals ($500), Utilities ($10,000), Repair/Maintenance ($4,500) and Machinery/Equipment ($25,000).
Total GAP in Element #5										**(1.48)**	**($168,927)**	**($53,000)**	**($221,927)**	This line item shows the "gap" or difference between the existing allocated FTE and expenses and the FTE and expenses needed to fully implement the future program.

New Permit Section Reference or Other Reference	Stormwater Program Element	Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)	Current Activities	Source of Information	Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)*	Existing Staff Cost ($)	Existing Expenses ($)	Total Existing Program Costs	Future Activities *(in addition to Current/ Previously Completed Activities)*	Future Staff FTE	Future Staff Cost ($)	Future Total Expense ($)	Total Future Program Costs	Comments
SWM Element #6 – Program Implementation														
S5.A.1	**6.1 SWM Plan Implementation**	Develop and implement a SWM Plan that covers the geographic area subject to the permit. Included with Elements 1 through 5.	Not Applicable at this time.						Develop and implement a SWM Plan (as defined by the Ecology Permit) that covers the geographic area subject to the permit. Included with Elements 1 through 5.	0.02	$2,005	$0	$2,005	Please note: The reference to "SWM Plan" in this element is different than the City's current Comprehensive Stormwater Plan project.
S5.A.2	**6.2 SWM Plan Documentation**	Prepare written documentation of the SWMP and issue annual updates with the Annual Report to Ecology. Starting in 2015, Annual Reports on the new Permit must be submitted using Ecology's WA WebDMR program and include attachments to support work completed during the reporting period. Attachments to the annual report should include summaries, descriptions, reports, and other information as required, or as applicable, to meet the requirement of the permit during the reporting period.	Not Applicable at this time.						Prepare written documentation of the SWMP and issue annual updates with the Annual Report to Ecology.	0.01	$1,003	$0	$1,003	
S5.A.3	**6.3 NPDES Program Tracking**	Track the cost or estimated cost of development and implementation of the SWM Plan; provide this information to Ecology upon request.	Not Applicable at this time.						Track the cost or estimated cost of development and implementation of the SWM Plan; provide this information to Ecology upon request.	0.01	$1,003	$1,000	$3,005	
		Track the number of inspections, enforcement actions, and public education activities. Include this information in the Annual Report.	Not Applicable at this time.						Track the number of inspections, enforcement actions, and public education activities.	0.01	$1,003			
S5.B	**6.4 MEP and AKART**	Design the SWM Plan to reduce discharge of pollutants to the Maximum Extent Practicable (MEP), meet State AKART requirements, and protect water quality.	Not Applicable at this time.						Design the SWM Plan to reduce discharge of pollutants to the Maximum Extent Practicable (MEP), meet State AKART requirements, and protect water quality.	0.02	$2,005	$0	$2,005	
	Total – Element #6				**0.00**	**$0.00**	**$0.00**	**$0.00**		**0.07**	**$7,019**	**$1,000**	**$8,019**	
	Total GAP in Element #6									**(0.07)**	**($7,019)**	**($1,000)**	**($8,019)**	This line item shows the "gap" or difference between the existing allocated FTE and expenses and the FTE and expenses needed to fully implement the future program.
SWM Element #7 – Total Maximum Daily Load Allocations: Stillaguamish River														
S7.A	**7.1 Permit Recognized TMDLs**	Applicable TMDLs are listed in Appendix 2 of the NPDES Permit.	Not Applicable at this time; however, there is a EPA approved implementation plan for a TMDL on the Stillaguamish River.	Ecology Website					This element assumes TMDL implementation will be required by the City under a future Permit.	0.03	$3,008	$15,000	$18,008	For more information on the Stillaguamish TMDL see: **http://www.ecy.wa.gov/programs/wq/tmdl/StillaguamishTMDL.html**. This element assumes TMDL implementation will be required by the City under a future Permit.
S7.B	**7.2 TMDLs not Listed in Permit**	Compliance with TMDLs not listed in Appendix 2 of the Permit is achieved by meeting the requirements of the Permit. It includes keeping records and reporting activities relevant to applicable TMDLs.	Not Applicable at this time; however, there is a EPA approved implementation plan for a TMDL on the Stillaguamish River. This element assumes TMDL implementation will be required by the City under a future Permit.	Ecology Website					This element assumes TMDL implementation will be required by the City under a future Permit.	0.02	$2,005	$0	$2,005	
S7.C	**7.3 TMDLs Approved during the Permit Cycle**	Comply with future TMDL requirements issued through permit modifications.	Not Applicable at this time; however, there is a EPA approved implementation plan for a TMDL on the Stillaguamish River. This element assumes TMDL implementation will be required by the City under a future Permit.	Ecology Website					This element assumes TMDL implementation will be required by the City under a future Permit.	0.02	$2,005	$0	$2,005	
	Total – Element #7				**0.00**	**$0.00**	**$0.00**	**$0.00**		**0.07**	**$7,019**	**$15,000**	**$22,019**	
	Total GAP in Element #7									**(0.07)**	**($7,019)**	**($15,000)**	**($22,019)**	This line item shows the "gap" or difference between the existing allocated FTE and expenses and the FTE and expenses needed to fully implement the future program.

New Permit Section Reference or Other Reference	Stormwater Program Element	Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)	Current Activities	Source of Information	Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)*	Existing Staff Cost ($)	Existing Expenses ($)	Total Existing Program Costs	Future Activities *(in addition to Current/ Previously Completed Activities)*	Future Staff FTE	Future Staff Cost ($)	Future Total Expense ($)	Total Future Program Costs	Comments
SWM Element #8 – Monitoring														
S8.B	**8.1 Existing Monitoring**	The requirements of this element are population based. At the time the Permit would be issued, if Stanwood has a population less then 10,000 therefore the City may not be not be required to identify two outfalls or conveyances where stormwater sampling could be conducted. If this requirement had been applicable to the City, one outfall would have been required to represent commercial land use and the second represent high-density residential and use. Describe any stormwater monitoring or studies and type of information gathered in annual report; Assess the appropriateness of the BMPs in the SWM Plan and note any proposed changes.	No existing program in place.						If Stanwood's population exceeds 10,000 at the time of Permit issuance, the City will identify two outfalls or conveyances where stormwater monitoring should be conducted.	0.07	$7,019	$20,000	$27,019	
S8.C.1.a	**8.2 Stormwater Monitoring**	Prepare for future monitoring by selecting two outfalls for flow-weighted composite sampling (must meet Ecology requirements). Document site selection, possible constraints, basin description, and water quality concerns in receiving waters.	In partnership with Snohomish County, the City has completed some stormwater monitoring for bacteria in Irvine Slough.	City Staff Questionnaire (March 2014)					Prepare for future monitoring by selecting two outfalls for flow-weighted composite sampling (must meet Ecology requirements). Document site selection, possible constraints, basin description, and water quality concerns in receiving waters.					
S8.C.1.b	**8.3 SWMP Effectiveness Monitoring**	Prepare for future monitoring by identifying two questions be studied and selecting monitoring sites. Develop a monitoring plan based on Ecology requirements.	No existing program in place.						Prepare for future monitoring by identifying two questions be studied and selecting monitoring sites. Develop a monitoring plan based on Ecology requirements.					
S8.A, S8.C.2	**8.4 Annual Reporting**	Describe the status of identifying monitoring sites, questions, and developing monitoring plan. In the City's annual report provide a description of any new stormwater monitoring or stormwater-related studies conducted by the City during the reporting Permit.	No existing program in place.						Describe the status of identifying monitoring sites, questions, and developing monitoring plan. In the City's annual report provide a description of any new stormwater monitoring or stormwater-related studies conducted by the City during the reporting Permit.					
S8.B.1, 2	**8.5 Status and Trends Monitoring**	The City has two options for status trends monitoring. They are required to notify Ecology of which option is selected.	No existing program in place.						The City has two options for status trends monitoring. They are required to notify Ecology of which option is selected.					
S8.C.1,2	**8.6 Effectiveness Studies**	The City has two options for effectiveness studies. They are required to notify Ecology of which option is selected.	No existing program in place.						The City has two options for effectiveness studies. They are required to notify Ecology of which option is selected.					
S8.D.1,2	**8.7 Source Identification and Diagnostic Monitoring Information Repository**	The City has two options for source identification and diagnostic monitoring information repository. They are required to notify Ecology of which option is selected.	No existing program in place.						The City has two options for source identification and diagnostic monitoring information repository. They are required to notify Ecology of which option is selected.					
	Total – Element #8				**0.00**	**$0.00**	**$0.00**	**$0.00**		**0.07**	**$7,019**	**$20,000**	**$27,019**	
	Total GAP in Element #8									**(0.07)**	**($7,019)**	**($20,000)**	**($27,019)**	This line item shows the "gap" or difference between the existing allocated FTE and expenses and the FTE and expenses needed to fully implement the future program.

New Permit Section Reference or Other Reference	Stormwater Program Element	Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)	Current Activities	Source of Information	Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)*	Existing Staff Cost ($)	Existing Expenses ($)	Total Existing Program Costs	Future Activities *(in addition to Current/ Previously Completed Activities)*	Future Staff FTE	Future Staff Cost ($)	Future Total Expense ($)	Total Future Program Costs	Comments
SWM Element #9 – Reporting														
S9.A&B	**9.1 Annual Reports**	Submit annual reports each year on the previous year's NPDES Phase II activities. Report includes current SWM Plan, Annual Report Form (Appendix 3 of Phase II Permit), and applicable supporting documentation. Submit an annual report no later than March 31 of each year. Submit annual report electronically using Ecology's WA WebDMR program which is available through Ecology's website. Include attachments to the annual report including summaries, descriptions, reports and other information as required, or as applicable to meet the requirements of the Permit during the reporting period.	No existing program in place.						Develop and submit an Annual Report on the status of Permit requirements to Ecology annually in March.	0.01	$1,003	$0	$1,003	
S9.C.2	**9.2 Ongoing Tracking**	To support annual report submittal, maintain records of activities completed and implementation status of each element in Elements 1 through 5. Track progress toward meeting minimum performance measures and plans for meeting future permit deadlines.	No existing program in place.						Track all the activities of the Stormwater Program, specific to the requirements of the Permit.	0.01	$1,003	$0	$1,003	
S9.C	**9.3 Maintaining Records**	Maintain records of SWM Plan and permit activities for five years.	Public Works uses IWORQ's work order system to track and document all Stormwater Program related activities.	City Staff Questionnaire (March 2014)					Maintain records of SWM Plan and Permit activities with IWORQ.	0.01	$1,003	$0	$1,003	
S9.D	**9.4 Public Access**	Make all records of SWMP and permit activities available to the public at reasonable times during business hours.	No existing program in place.						Make all records of SWMP and Permit activities available to the public at reasonable times during business hours.	0.01	$1,003	$0	$1,003	
S9.E.4	**9.5 LID Barriers**	Submit a LID barriers memo that summarizes the City's identified barriers to the use of LID.	No existing program in place.						Submit a LID barriers memo that summarizes the City's identified barriers to the use of LID.	0.01	$1,003	$0	$1,003	
	Total – Element #9				**0.01**	**$872**	**$0.00**	**$872**		**0.05**	**$5,013**	**$0**	**$5,013**	The existing FTE includes a 0.01 FTE for Administrative Support.
	Total GAP in Element #9									**(0.04)**	**($4,141)**	**$0**	**($4,141)**	This line item shows the "gap" or difference between the existing allocated FTE and expenses and the FTE and expenses needed to fully implement the future program.

New Permit Section Reference or Other Reference	Stormwater Program Element	Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)	Current Activities	Source of Information	Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)*	Existing Staff Cost ($)	Existing Expenses ($)	Total Existing Program Costs	Future Activities *(in addition to Current/ Previously Completed Activities)*	Future Staff FTE	Future Staff Cost ($)	Future Total Expense ($)	Total Future Program Costs	Comments
SWM Element #10 – Underground Injection Control Rule														
WAC 173-218-0701.a.i-iv	**10.1 Register Wells**	Complete Ecology Registration forms and submit (WAC 173-218-070.1.a.i-v). Information includes: Operator/Owner information; site location; BMPs used to protect groundwater quality, UIC well description; information necessary to demonstrate that the non-endangerment standard (WAC 173-218-080 and WAC 173-218-090) has been met.	There is one UIC well currently registered with Ecology within the City of Stanwood.						Register future publically owned UIC wells built in the City limits.	0.01	$1,003	$0	$1,003	In the City, there is one UIC well registered with Ecology.
WAC 173-218-070 1.b.i	**10.2 Assess Wells**	According to WAC 173-218-090.2.a.ii, the approach to conducting the well assessment will be determined by the Owner. The assessment evaluates the potential risks to groundwater from the use of UIC wells. Any assessment that identifies a well as a high threat to groundwater must include a retrofit schedule (WAC 173-218-090.a.iii), and immediate action must be taken to correct the use of a well that is determined to be an imminent public health hazard (WAC 173-218-090.a.iv).	Not Applicable at this time.						Develop and conduct a UIC assessment protocol.	0.03	$3,008	$1,500	$4,508	
WAC 173-218-070 1.b.i	**10.3 New Well Requirements**	Prior to use, new wells must meet the requirements of WAC 173-218-080 and WAC 173-218-090 which call for preventing the movement of fluid containing any contaminant into the groundwater if it may cause a violation of groundwater quality standards. Compliance with the nonendangerment standard can be met through one or a combination of two approaches: presumptive (WAC 173-218-090.1.c.i.A-D) or demonstrative (WAC 173-218-090.1.c.ii.A-E).	Not Applicable at this time.						Ensure new UIC wells meet all WAC requirements.	0.01	$1,003	$0	$1,003	
WAC 173-218-070 1.b.ii	**10.4 Annual Updates**	After initial well registrations have been sent to Ecology, provide an annual update on any well status changes.	Not Applicable at this time.						Provide annual UIC reports to Ecology.	0.01	$1,003	$0	$1,003	
WAC 173-218-120	**10.5 Well Decommissioning**	Wells must be decommissioned by filling or plugging the well so that it will not result in an environmental, public health or safety hazard, and will not serve as a channel for movement of water or pollution to the aquifer as specified in WAC 173-218-120.3.b.i-ii). Ecology must be notified 30 days prior to decommissioning wells that pose an imminent public health hazard, otherwise notification must occur within one year of closure.	Not Applicable at this time.						Ensure all UIC well decommissioning meet the requirements of the WAC.	0.01	$1,003	$0	$1,003	
	Total – Element #10				0.00	$0.00	$0.00	$0.00		0.07	$7,019	$1,500	$8,519	
	Total GAP in Element #10									(0.07)	($7,019)	($1,500)	($8,519)	This line item shows the "gap" or difference between the existing allocated FTE and expenses and the FTE and expenses needed to fully implement the future program.

New Permit Section Reference or Other Reference	Stormwater Program Element	Activities/BMPs Needed for Regulatory Compliance (includes the current NPDES Phase II Permit activities/BMPs, effective August 1, 2013)	Current Activities	Source of Information	Existing Staff FTE *(Based on 2014 Adopted Budget for Storm Drainage)*	Existing Staff Cost ($)	Existing Expenses ($)	Total Existing Program Costs	Future Activities *(in addition to Current/ Previously Completed Activities)*	Future Staff FTE	Future Staff Cost ($)	Future Total Expense ($)	Total Future Program Costs	Comments
SWM Element #11 – Stormwater Capital Improvement Program														
	11.1: Stormwater CIP Projects	This element covers stormwater related stormwater related CIP Project design and construction.	The City as an existing 2014 CIP Project List.				$645,000		Continue to design and construct Stormwater CIP projects.	0.50	$50,133	$650,000	$700,133	The 2014 CIP Costs are covered out of the 2014 Capital Budget ($645,000).
	11.2 Long Term Stormwater Infrastructure Replacement	This element covers long term stormwater infrastructure replacement needs.	The City does not currently have a long term stormwater infrastructure replacement program.						Identify, design and construct long term stormwater infrastructure replacement projects each year.	0.15	$15,040	$100,000	$115,040	
	11.3 Small Works Stormwater Projects	This element covers annual/as-needed small works projects.	The City does currently has a small works stormwater project program, where they build small drainage improvement projects each year.				$65,000		Continue to identify, design and construct small works drainage improvement projects each year.	0.10	$10,027	$75,000	$85,027	The 2014 Drainage Improvement Projects are covered out of the 2014 Capital Budget ($65,000).
	Total – Element #11				0.14	$12,206	$710,000	$722,206		0.75	$75,200	$825,000	$900,200	The existing FTE includes a 0.05 FTE allocation for the City Manager, 0.05 FTE for the Public Works Director, 0.02 FTE for the Supervisor, and 0.02 FTE for Administrative Support.
	Total GAP in Element #11									(0.61)	($62,993)	($115,000)	($177,993)	This line item shows the "gap" or difference between the existing allocated FTE and expenses and the FTE and expenses needed to fully implement the future program.
SWM Element #12 – Administrative and Additional Activities														
	12.1 Materials and Supplies	This element covers uniforms and supplies for the Stormwater Program.	This element covers the cost of uniforms and supplies for the Stormwater Program.				$5,200	$5,200	Continue to fund the costs of uniforms and supplies (assumes a 15% increase needed in the future program).	0.01	$1,003	$5,980	$6,983	The 2014 Stormwater Program expense dollars allocated in this element include Supplies ($4,000) and Uniforms ($1,200).
	12.2 Program Overhead, Administration and Transfers Out	This element covers Program Overhead for the Stormwater Program including meetings, trainings, travel, interfund payment payments for service and transfers-out.	This element covers Program Overhead for the Stormwater Program including meetings, trainings, travel, interfund payment payments for service and transfers-out.				$225,457	$225,457	This element covers Program Overhead for the Stormwater Program including meetings, trainings, travel, interfund payment payments for service and transfers-out (assumes a 15% increase needed in the future program).	0.10	$10,027	$259,276	$269,302	The 2014 Stormwater Program expense dollars allocated in this element include Meeting, Training and Travel ($750), Interfund Payment for Service ($51,507), and Less-Transfers Out ($173,200).
	12.3 Professional Services	This element covers Professional Services to the support the Stormwater Program.	This element covers Professional Services to the support the Stormwater Program.				$42,500	$42,500	This element covers Professional Services to the support the Stormwater Program (assumes a 15% increase needed in the future program).	0.10	$10,027	$48,875	$58,902	The 2014 Stormwater Program expense dollars allocated in this element include Professional Services ($42,500).
	12.4 Insurance, Taxes and Permits	This element covers Insurance, B&O Taxes, and State Operating Permits, to the support the Stormwater Program.	This element covers Insurance, B&O Taxes, and State Operating Permits, to the support the Stormwater Program.				$37,400	$37,400	This element covers Insurance, B&O Taxes, and State Operating Permits, to the support the Stormwater Program (assumes a 15% increase needed in the future program).	0.04	$4,011	$43,010	$47,021	The 2014 Stormwater Program expense dollars allocated in this element include Insurance ($30,600), B&O Taxes ($6,200) and State Operating Permits ($600).
	12.5 Miscellaneous Expenditures	This element covers Miscellaneous Expenditure, including Communication, to the support the Stormwater Program.	This element covers Miscellaneous Expenditure, including Communication, to the support the Stormwater Program.				$3,000	$3,000	This element covers Miscellaneous Expenditure, including Communication, to the support the Stormwater Program (assumes a 15% increase needed in the future program).	0.01	$1,003	$3,450	$4,453	The 2014 Stormwater Program expense dollars allocated in this element include Communication ($3,000).
	Total – Element #12				0.26	$22,669	$313,557	$336,226		0.26	$26,069	$360,591	$386,660	The existing FTE includes a 0.10 FTE allocation for the City Manager, 0.05 FTE for the Public Works Director, 0.02 FTE for the Supervisor, and 0.09 FTE for Administrative Support.
	Total GAP in Element #12									0.00	($3,400)	($47,034)	($50,434)	This line item shows the "gap" or difference between the existing allocated FTE and expenses and the FTE and expenses needed to fully implement the future program.
			TOTALS		**2.09**	**$182,223**	**$1,066,057**							
			GRAND TOTAL		**2.09**	**$1,248,280**								
			FUTURE TOTALS							**5.50**	**$551,464**	**$1,341,341**		
			GRAND TOTAL FUTURE							**5.50**	**$1,892,805**			
			TOTAL GAP							**(3.41)**	**$369,241**	**$275,284**		

Notes

- Activities are based on the *Western Washington Phase II Municipal Stormwater Permit* , issued January 17, 2007, and modified June 17, 2009, and the New Final Western Washington Phase II Municipal Permit effective August 2013.
- The permit effective dates are February 16, 2007, through August 15, 2013. The New Permit will be effective August 15, 2013, through August 15, 2018.
- "Permit End" means 180 days prior to the expiration date of the permit (8/19/2011)
- "2005 Ecology Manual" refers to the Washington State Department of Ecology's 2005 *Stormwater Management Manual for Western Washington.*
- "2012 Ecology Manual" refers to the Washington State Department of Ecology's 2012 *Stormwater Management Manual for Western Washington.*
- Monitoring requirements vary based on City or County population. Guidelines listed here are for small cities (population between 10,000 and 75,000).

EXISTING GRAND TOTAL	**$1,248,280**
FUTURE GRAND TOTAL	**$1,892,805**
GRAND TOTAL GAP	**($644,525)**

From City of Stanwood - 2014 Budget

Drainage Utility Revenues

Description	2013 Actual	2014 Budget	Allocation to Elements
Beginning Balance	$578,866	$600,000	
Revenues			
Charges for Services	$425,000	$425,000	
Misc. Revenues	$1,300	$1,300	
Total Revenues	$426,300	$426,300	

Drainage Utility Expenditures

Description	2013 Actual	2014 Budget	Allocation to Elements
Operating Expenditures			
Salaries and Wages	$96,400	$121,520	See FTE Spreadsheet
Overtime	$400	$463	See FTE Spreadsheet
Social Security	$7,500	$9,332	See FTE Spreadsheet
Retirement	$8,000	$11,897	See FTE Spreadsheet
Medical Benefits	$23,500	$32,803	See FTE Spreadsheet
L & I	$2,600	$2,549	See FTE Spreadsheet
Unemployment Insurance	$1,200	$3,659	See FTE Spreadsheet
Supplies	$2,500	$4,000	12.1
Uniforms	$1,200	$1,200	12.1
Fuel	$1,500	$1,500	5
Small Equipment	$400	$1,000	5
Professional Services	$42,500	$42,500	12.3
Communications	$3,000	$3,000	12.5
Rentals	$500	$500	5
Insurance	$30,600	$30,600	12.4
Utilities	$10,000	$10,000	5
Repair/Maintenance	$4,500	$4,500	5
B & O Tax	$6,200	$6,200	12.4
Meeting, Training and Travel	$758	$750	12.2
State Operating Permits	$600	$600	12.4
Interfund Payment for Service	$46,395	$51,507	12.2
Advertising	$0	$0	N/A
Total Operating Expenditures	$290,253	$340,080	N/A
Non-Operating Expenditures			
Machinery & Equipment	$0	$25,000	5
Total Non-Operating Expenditures	$0	$25,000	N/A
Total Expenditures	$290,253	$365,080	N/A
Less: Transfers-Out	$110,000	$173,200	12.2
Ending Cash Balance	$604,913	$488,020	N/A
Total		$538,280	

Capital Budget Expenditures		2014 Budget	Allocation to Elements
Protect the Community From Flooding			
SR532 Berm/Bike and Pedestrian Path		$100,000	11.1
Irvine Slough Pump Station Restoration		$245,000	11.1
Irvine Slough Conveyance Study		$300,000	11.1
Drainage Improvement Projects		$65,000	11.3
Total		$710,000	

City of Stanwood - 2014 Staffing Levels for Drainage Program

Name	FTE Allocated to Drainage		Allocation to Elements
Deborah Knight	0.15	City Manager	11, 12
Kevin Hushagen	0.15	Public Works Director	4, 5, 11, 12
Lisa Noonchester	0.15	Admin Support	2, 5, 9, 12
Supervisor (Vacant)	0.15	Supervisor	5, 11, 12
Trevor Harrison	0.25	O&M	3, 4, 5
Dave Smith	0.33	O&M	5
Scott Justesen	0.25	O&M	5
Nathan Towse	0.33	O&M	5
Seasonal	0.33	O&M	5
Total	**2.09**		

Total FTE Costs*	$182,223
Average Hourly Rate	$41.92
Future Hourly Rate*	$48.20

**Assumed 2,080 Hours/FTE*

**Assumed an increase of 15% in staff costs for the future program for future planning purposes.*