

City of Everett
**2014 Comprehensive
Sewer Plan**

VOLUME 3
Basin Plans

November 2014



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Appendix – Green Stormwater Infrastructure

1.0 Introduction

The City of Everett 2014 Comprehensive Sewer Plan (CSP), Volume 3: Basin Plans (Basin Plans) encompasses the basin descriptions, analysis, and the recommended capital improvement program (CIP) projects for each basin in the City of Everett sewer service system. The Basin Plans are a component of the CSP. However, the Basin Plans volume, intended to summarize the information on a basin-by-basin level, is provided under separate cover from the Plan. For greater detail, the City of Everett CSP should be referenced.

To develop the CSP, the City of Everett sewer service area was divided into 22 drainage basins, as shown in Figure 1. These basins represent drainage areas where a gravity main collects sewer flows and conveys them to an interceptor. Figure 2 shows a schematic of the basins that depicts connectivity among the basins. The basins are presented in the subsections that follow, beginning with the combined sewer system area in the north (Basins A to T-Q), followed by the sanitary sewer area to the south (Basins SW-1 to SE-10).

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2014 Comprehensive Sewer Plan City of Everett

FIGURE 1

Sewer Basin Map

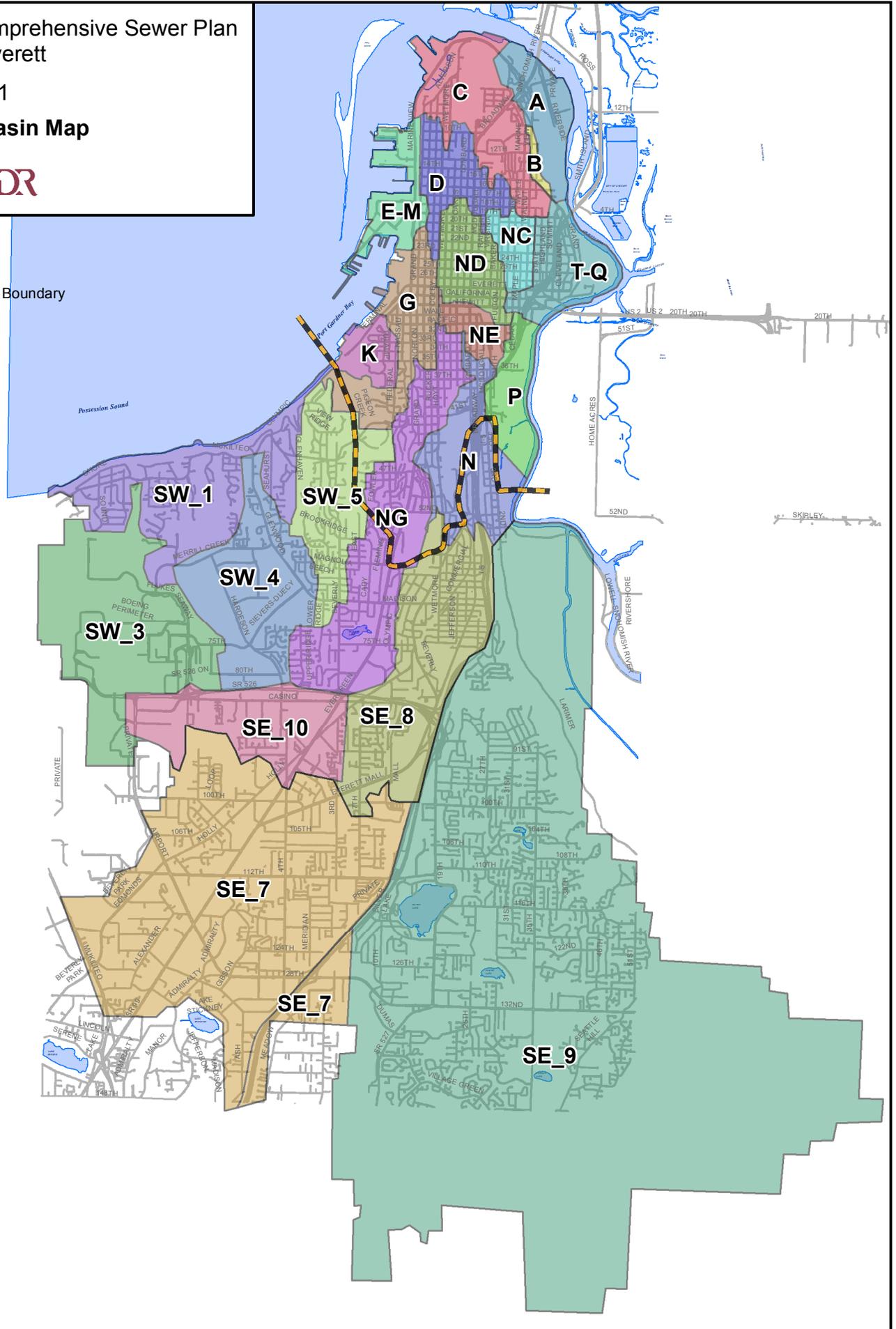


Legend

- Water
- Model Boundary

Sewer Basin

- A
- B
- C
- D
- E-M
- G
- K
- N
- NC
- ND
- NE
- NG
- P
- SE 10
- SE 7
- SE 8
- SE 9
- SW 1
- SW 3
- SW 4
- SW 5
- T-Q



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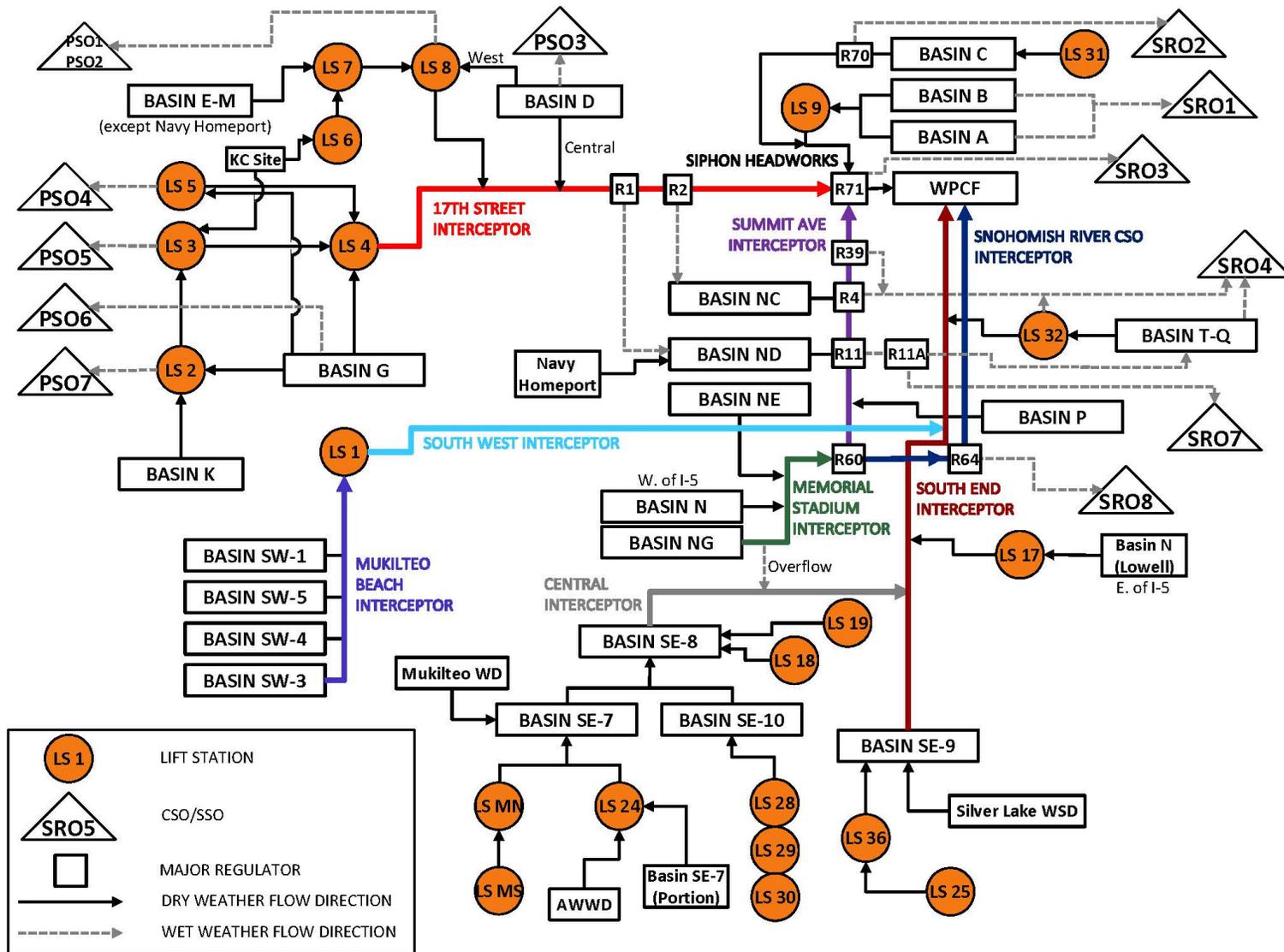


Figure 2. City of Everett Sewer System Schematic

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2.0 Basin Plan Format

The basin plan format is divided into six sections:

- Basin Description
- Sewer Flows
- Existing System
- CIP Projects
- Comments
- Basin Map

2.1 Basin Description

The basin description summarizes descriptive information about the basin, including location, size, sensitive areas, major arterials, large users, and current level of development.

The location description identifies the boundaries, neighborhoods, and other identifying features. The sensitive areas description includes descriptions of significant wetlands, areas that recharge aquifers used as a potable water source, areas of recurrent flooding, geological hazardous areas, and habitat conservation areas. The geologically sensitive areas in the City are characterized by wetlands, a seismic region, and steep slopes.

The Land Use Element of the City's Comprehensive Plan is the source for the existing land use description within the City's planning area. The Land Use Element summarizes existing land use and the holding capacity under that land use classification. The Land Use Code for the City of Everett is the source of the data for the Future Development description. This document describes each type of land use and density.

2.2 Sewer Flow

The sewer flow section summarizes the results of the growth projections and future flow estimates. Greater detail is provided in Chapter 4 of the CSP and Hydraulic Modeling Technical Memorandum in Appendix K.

Demographics were developed for Everett's sewer service area based on Puget Sound Regional Council (PSRC) data. The PSRC provides projections for certain milestone years (2010, 2020, 2030, and 2040) and the intervening years were interpolated for this project. The demographic data used in this plan is comprised of four key categories: population, single family households, multifamily households, and employees. Water use factors were used to convert demographic projections into sewer system flows for each basin.

Sanitary sewer flow projections were calculated out to 2040 for the Everett sewer service area by multiplying the water demand forecast by the percent of the water demand going to the sewer system. The projections were extended to 2100 by using the annual growth rates during the period 2030-2040 (1.3% for the entire system), the annual growth rates during the period 2040-2050 and then using a 0.5% annual growth rate during the period 2050-2100, which is similar to the method used in the 2007 Everett Comprehensive Water Plan.

Separate sanitary sewer flow projections were developed for several large industrial customers. These customers were identified as those within the industrial pretreatment program that had flow rates of 50,000 gpd or larger.

Sewer flow projections were developed for the neighboring collection systems that convey sewage to the Everett WPCF. For Silver Lake WSD, Alderwood WWD, and Mukilteo WWD, the projections were based on the capacity required to be provided by Everett, as stipulated in the sewage disposal agreements. For the City of Snohomish, the capacity from the 2011 City of Snohomish Everett Conveyance Project Facility Plan was used.

The sanitary sewer flow projections were converted into Equivalent Residential Units (ERUs) for each basin based on a value of 209 gpd / ERU. The ERUs are listed for the existing system, Plan Year 2036, Plan Year 2100. Included in this section is data regarding the growth in the basin. These percent values are a comparison from current flow to the Year 2036 and Year 2100 flow values.

2.3 Existing System

This section describes the existing facilities of the basin sewer system including: type of sewer system (combined or sanitary), conveyance facilities (pipe length and diameter range), trunk interceptor, pumping stations, flow monitors used for calibration (SFE Global between 2009 and 2012), flow control facilities, and overflows. Upstream and downstream basins are also identified.

The peak dry- and wet-weather flow rates are also identified for each basin. The flow values include all upstream basins and represent the flow at the downstream point of the basin.

The majority of the developed areas in the City are served by the sewer system. However, relatively small areas of the City are served by septic systems. These areas are identified on the basin plan maps.

2.4 Improvement Program

Capital improvement program (CIP) projects were recommended for each basin based on analysis of the collection system for existing and future sewage flow projections and on available condition assessment information provided by the City's personnel. The analyses and documentation identified projects that are required to continue to provide quality sewer service to Everett's current and future ratepayers.

The CIP was developed to achieve the following main objectives:

- Identify, group, and prioritize various sewer system needs that would receive maximum benefits from each proposed project
- Recommend and schedule improvements to provide an acceptable LOS (LOS) within the overall financial ability of Everett to fund the improvements and coordinate construction of improvements with anticipated growth within the service area

The hydraulic model was used to identify LOS and combined sewer overflow (CSO) related deficiencies and improvements following the design criteria described in the Hydraulic Modeling Technical Memorandum in Appendix K.

Several modeling scenarios were developed to incorporate peak wet-weather responses with existing and Year 2100 population with rainfall adjusted to account for climate change. Model results were used to evaluate the adequacy and operational characteristics of the existing system and to evaluate the requirements of the system to accommodate future growth.

Based on available data and interviews with maintenance staff, improvements associated with the existing lift stations, regulators, and other system facilities not analyzed in the model have been identified for improvement.

Existing pipe condition assessment data was not available; it is assumed based on available pipe age information. For sewer pipe that is greater than 80 years old, a pipe condition replacement could be considered.

This section provides a description of each project, the project justification, schedule and project cost estimate.

2.4.1 Sewer Response Criteria

LOS is defined as how frequently the capacity of a sewer pipe is exceeded. Everett established a LOS goal that sewer pipes should not exceed their capacity more than once every ten years.

The modeling analysis was used to determine the current LOS for each pipe in the system and to identify improvements necessary to meet Everett’s LOS goal.

To determine the current LOS for Everett’s collection system pipes, the model was used to simulate the 14 Storm Series described in Section 4.1.4. Simulated rainfall events determine if a pipe exceeds its capacity. In areas without reported basement backups, surcharging is allowed to five feet below the rim of the manhole. In areas where backups occurred, no surcharging above the crown of the pipe is allowed.

A pipe capacity exceedence event is defined as a flow that causes the water level in the pipe to rise above either of the two thresholds described above (depending on the area). The LOS recurrence interval for any particular pipe is determined based upon the number of times that flow exceeds the threshold during the 24 year rainfall record.

Table 2-1. Recurrence Interval for 24 Years of Everett Data

Event Count	Recurrence Interval (T_r) LOS (years)		LOS Category Years
	Gringorten's Equation	Weibull's Equation	
1	43.1	25.0	> 25
2	15.5	12.5	10 to 25
3	9.4	8.3	5 to 10
4	6.8	6.3	
5	5.3	5.0	
6	4.3	4.2	< 5
10	2.5	2.5	
15	1.7	1.7	
20	1.2	1.3	
25	1.0	1.0	

After running the model, a statistical tool is used to determine the number of times that the flow depth in each pipe exceeded a threshold (i.e. crown of pipe, 3 feet above crown, 5 feet below rim) with a minimum inter-event period during of 8 hours. An inter-event period is defined as the time between events in which the flow depth exceeds the threshold. A single event would be counted when the flow depth continuously exceeds the threshold for any duration of time, or multiple occurrences of the flow depth exceeding the threshold as long as there are less than eight hours between each occurrence. A new event will not be counted unless a period of 8 hours occurs without the flow depth exceeding the threshold.

This period of record and methodology is sufficient to statistically classify the LOS provided by each of the pipes into one of the four LOS categories (greater than 25 years, 10 to 25 years, 5 to 10 years, and less than 5 years).

Modeling Scenarios and Alternatives Analysis

The following three base continuous simulation scenarios were analyzed in the model:

1. **Current LOS Scenario:** The 14 Storm Series derived from Everett's rainfall record was simulated to document Everett's current LOS. Data generated from this simulation were used to create the LOS mapping and determine existing pipe capacities.
2. **Year 2100 Level of Service Scenario:** Multiple alternatives for conveyance improvements were evaluated in this scenario. The 14 Storm Series adjusted for climate change and the Year 2100 base load projections were simulated in the system to evaluate future improvements. Figures and descriptions are included in the Hydraulic Modeling TM provided in Appendix K.
3. **CSO Compliance Scenario:** The 69 Storm Series was simulated in the model to determine CSO compliance in the existing system, evaluate proposed CSO improvements, and determine the impacts to CSO compliance from proposed LOS improvements.

In addition to the criteria described above, areas identified by the model with a current LOS of less than 25 years were evaluated along with the following additional information to determine if an improvement is recommended:

- There is a record of basement backups in the area
- The pipe is aging or in poor condition
- Surcharging is not allowed
- Flow data confirm model results
- Geometry and slope are not influenced by a downstream main surcharging

The alternatives evaluated in the model include conveyance improvements, lift station improvements, removal of leaping weirs and other diversions, green stormwater infrastructure, and CSO storage facilities. A detailed description of the alternatives analysis methodology and results is included in the Hydraulic Modeling Technical Memorandum in Appendix K.

2.4.2 Cost Estimate Assumptions

The costs prepared are based on engineering estimates prepared by HDR, OTAK, and Jacobs, Tabula version 3.1.2 cost estimating software, and inflation adjusted costs from the 2006 Comprehensive Sewer Plan. All project costs are in 2014 dollars.

The costs presented in this 2014 Sewer Plan have been developed as guidance for evaluating the projects. The costs are based on currently available information and are presented in 2014 dollars, which have not been adjusted for future escalation.

The final project costs will depend on actual labor and material costs, actual site conditions, productivity, competitive market conditions, final project scope, final project schedule, and other variable factors. Because of these other factors, final costs will vary from the costs presented in this 2014 Sewer Plan; therefore, funding needs must be carefully reviewed before making specific financial decisions or establishing final budgets.

Project markups include the following:

- Contingency at 50 percent, to be included to account for undefined scope of work
- Sales tax at 9.2 percent
- Allied costs consisting of engineering, legal, administration, and coordination at 35 percent

Appendix M provides supporting documentation for capital improvement project costs.

2.5 Comments

In this section, unique conditions that affect the capital improvements of each basin are discussed, upstream development, basement flooding complaints, lift station condition assessment results, etc.

2.6 Basin Map

With each basin plan, a detailed map detailing the basin boundary, existing pipe network, interceptors and receiving facilities, existing lift stations, existing regulators and overflows, and recommended capital improvements is included.

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3.0 Capital Improvement Program

3.1 Capital Improvement Program (2015 – 2024)

A complete list of the recommended improvements for the 2014 Sewer Plan CIP scheduled through Year 2024 are provided in Table 3-1. Each capital improvement project is assigned an identification number either “CI” for collection and interceptor improvements or “WPCF” for improvements to the water pollution control facility.

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Table 3-1. Capital Improvement Program (2015 – 2024)

ID	Project Name	Type ⁽¹⁾	Funding Method ⁽²⁾	Schedule and Cost of Improvements (Millions of 2014 Dollars)										10-yr CIP Total
				2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Collection and Interceptor Improvements														
CI-1	COMBINED SEWER OUTFALLS (PS06) RELOCATION	R	1	\$0.4										\$0.4
CI-2	GRAND AVE PARK BRIDGE - SEWER & GEN FUND PORTION	R	1	\$1.0	\$1.0	\$5.1								\$7.1
CI-3	PORT GARDNER WET WEATHER STORAGE (K/C SITE)	C	1,4		\$7.0							\$1.0	\$1.0	\$9.0
CI-4	PSO 4 RELOCATION FOR K/C SITE	R	1			\$0.4	\$3.6							\$4.0
CI-5	RIVERFRONT LS 33 / CENTRAL AREA LS (60% UT/40% SW)	R	1	\$4.9	\$1.4									\$6.2
CI-6	SEWER PROJECT "N" - SEWER PORTION = 33%	R	1,4	\$0.1	\$0.1	\$1.6								\$1.8
CI-7	W MARINE VIEW DRIVE CSO CONVEYANCE	C	1						\$0.6	\$2.1	\$2.2			\$4.8
CI-8	HAYES ST REGULATOR AND CSO CONTROLS (SRO 1,2,3)	C	1,2	\$0.3	\$0.2	\$2.2								\$2.7
CI-9	17th STREET INTERCEPTOR	C	1							\$0.3	\$0.8	\$8.2	\$8.2	\$17.5
CI-10	SEWER PROJECT "M" - SEWER PORTION = 50%	R	1	\$3.4	\$1.3	\$3.2								\$7.8
CI-11	REGULATOR 4 & R39 MODIFICATION	R	1	\$0.1	\$0.2									\$0.3
CI-12	LIFT STATION #12	R	1			\$0.2	\$0.3	\$1.4						\$2.0
CI-13	BEVERLY LAKE SEWER REPLACEMENT	R	1	\$0.1	\$0.9									\$0.9
CI-14	E GRAND SEWER REPLACEMENT - SEWER PORTION - 33%	R	1,2	\$1.9	\$0.6	\$1.0								\$3.5
CI-15	SEWER COMPLAN	C	1	\$0.2			\$0.1	\$0.5	\$0.4					\$1.2
CI-16	FORCEMAIN REDUNDANCY	C	1,4,5			\$0.5	\$4.7	\$2.0	\$4.7	\$5.0	\$6.0	\$7.0	\$8.0	\$37.9
CI-17	SEWER SYSTEM CONDITION REPLACEMENT	R	1			\$0.2	\$1.2		\$1.0	\$1.1	\$1.1	\$1.1	\$1.2	\$6.9
CI-18	BACKWATER VALVE (BWV) INSTALLATION	C	1	\$0.7	\$0.7	\$0.7								\$2.1
CI-19	SEWER SYSTEM (LOS) IMPROVEMENTS	C	1			\$0.4	\$2.4		\$2.1	\$2.2	\$2.2	\$2.3	\$2.4	\$13.9
CI-20	SEWER SYSTEM CAPACITY IMPROVEMENTS	C	1,2				\$0.8	\$2.0	\$2.1	\$2.2	\$2.3	\$2.4	\$2.5	\$14.4
CI-21	SEWER SYSTEM MAINTENANCE PROJECTS	R	1,4			\$0.4	\$0.4	\$0.4	\$0.4	\$0.5	\$0.5	\$0.5	\$0.5	\$3.7
CI-22	SERVICE CENTER SEISMIC UPGRADES (30%)	R	1,4	\$0.2	\$0.2	\$2.1	\$2.4	\$1.9	\$2.7					\$9.5
Collection and Interceptor Improvements Total				\$13.2	\$13.4	\$18.2	\$16.1	\$8.3	\$14.0	\$13.3	\$15.1	\$22.5	\$23.7	\$157.7
WPCF Improvements														
WPCF-1	WPCF SOUTH OUTFALL (025) REHAB	R	1,5	\$0.1	\$0.1	\$1.1								\$1.3
WPCF-2	WPCF REPLACEMENTS (HVAC)	R	1	\$0.5										\$0.5
WPCF-3	WPCF CAPACITY EXPANSION - PHASE C	C	1,4,5	\$20.5	\$1.0	\$1.5	\$2.0	\$14.4	\$14.4			\$2.0	\$20.0	\$75.8
WPCF-4	WPCF - DIVERSION STRUCTURE NO. 0 MODIFICATIONS	R	1						\$0.8	\$7.0				\$7.8
WPCF-5	WPCF LAGOON CAPACITY EXPANSION	C	1,4,5			\$0.3	\$0.3				\$5.0	\$16.0		\$21.5
WPCF-6	WPCF FEN UPGRADES & N CL BLDG REPL	R	1,4	\$0.5	\$2.0	\$3.1								\$5.6
WPCF-7	12th STREET NE DIKE	C	1,4,5	\$1.4	\$0.3									\$1.7
WPCF-8	SMITH ISLAND DIKE IMPROVEMENTS	R	1	\$0.6	\$0.1	\$1.0	\$0.3	\$0.2						\$2.1
WPCF Improvements Total				\$23.5	\$3.5	\$6.9	\$2.5	\$14.6	\$15.2	\$7.0	\$5.0	\$18.0	\$20.0	\$116.2
TOTAL				\$36.7	\$16.9	\$25.1	\$18.6	\$22.9	\$29.2	\$20.3	\$20.1	\$40.5	\$43.7	\$274.0

1. C = Capacity Expansion, R = Rehab/Replacement

2. FM: Funding Methods, 1 = Rates, 2 = Grants, 3 = Loan (Public Works Trust Fund or State Revolving Fund), 4 = Bonds, 5 = Capital Contributions by Wholesale Customers, 6 = Other Than City Fund

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3.2 Collection and Conveyance Improvements Scheduled beyond 2024

The following are descriptions of collection and conveyance improvements scheduled beyond 2024. These projects were identified from the following two sources:

- 2006 Comprehensive Sewer Plan. Improvements that were identified in the 2006 CSP and schedule beyond 2024. Projects costs were adjusted to 2014 dollars based on the Engineering News Record construction cost indices for the City of Seattle (Jan 2005: 8165.36 and Jan 2014: 10140.15).
- Level of Service Analysis. These improvements were identified from modeling analysis of the level of service in the sewer collection system. The following table indicates the modeled level of service and if the improvement is justifiable based on the age and condition of the existing piping. Project cost estimates for these improvements were based on the cost estimating software Tabula v3.1.2

Figures and cost information are included in the basin plans.

Table 3-2. Unscheduled Collection and Conveyance Improvements

Project No.	Project Name	Justification	Modeled Level of Service	Project Source	Base Project Cost (2014 Million Dollars)
A-1A	East Marine View Dr North of Broadway	Level of Service	5-10 Yr	2006 CSP	\$1.1
A-1B	East Marine View Dr South of Broadway	Level of Service	5-10 Yr	2006 CSP	\$0.5
A-2A	Belmonte Ln to Butler St	Level of Service	5-10 Yr	2006 CSP	\$0.7
A-2B	Butler St West of Marine View Dr	Level of Service	5-10 Yr	2006 CSP	\$0.1
C-1	18" vic 17th and Pine St to 16th and E Grand Ave	Pipe Age & Level of Service	5-10 Yr	LOS	\$1.5
C-2	Larch St from 12th to 14th	Condition	n/a	LOS	\$0.9
D-1	Broadway Ave from 17th St to 11th St	Pipe Age & Level of Service	<5 Yr	LOS	\$3.1
G-1	Nassau Ave & Wall St to Grand Ave & Hewitt St	Level of Service	<5 Yr	LOS	\$1.3
G-2	Grand Ave from Everett Ave to 19th St	Level of Service	5-10 Yr	LOS	\$5.8
N-1	Colby Ave from Fairfax Ave to 48th St SE	Level of Service	<5 Yr	LOS	\$3.2
N-2	LS 17 Lift station upgrade and repair.	Condition	n/a	2006 CSP	\$0.1
NC-1	21st St from Pine St to Walnut St	Level of Service	5-10 Yr	LOS	\$1.5
NC-2	vic 24th St to Pine St to 26th St to Maple St to Everett Ave	Pipe Age & Level of Service	5-10 Yr	LOS	\$6.8
ND-1	21st St to 17th St. Interceptor	Level of Service	5-10 Yr	LOS	\$7.3
ND-2	Broadway Trunk Main Improvement	Level of Service	5-10 Yr	LOS	\$13.5
ND-3	Everett Ave from Rockefeller Ave to Broadway Ave	Level of Service	5-10 Yr	LOS	\$1.2
ND-4	24th St from Oakes Ave to Broadway Ave	Level of Service	5-10 Yr	LOS	\$0.5

Project	Project Name	Justification	Modeled	Project	Base Project
ND-5	McDougall Ave from Everett Ave to 24th St	Level of Service	<5 Yr	LOS	\$1.7
ND-6	Virginia Ave & 24th St to McDougall vic Everett Ave	Level of Service	5-10 Yr	LOS	\$2.2
ND-7	California St & Broadway to Hewitt Ave & Virginia	Level of Service	5-10 Yr	LOS	\$2.1
ND-8	Colby Ave, 26th St, Rockefeller, and Wetmore Ave	Level of Service	5-10 Yr	LOS	\$2.4
ND-9	21st St from Rockefeller to Broadway	Level of Service	5-10 Yr	LOS	\$0.5
ND-10	Fulton St and Virginia Ave	Pipe Age & Level of Service	5-10 Yr	LOS	\$5.6
ND-11	Rainier Ave from Everett Ave to 24th St	Pipe Age & Level of Service	5-10 Yr	LOS	\$1.6
ND-12	vic Wetmore Ave from 24th St to 19th St	Pipe Age & Level of Service	5-10 Yr	LOS	\$3.7
ND-13	vic Broadway from 23rd St to 19th St	Pipe Age & Level of Service	5-10 Yr	LOS	\$1.7
ND-14	McDougall Ave from 21st St to 24th St	Pipe Age & Level of Service	5-10 Yr	LOS	\$2.2
ND-15	Pacific Regulator to SRI Improvement	Level of Service	n/a	LOS	\$1.1
NE-1	Pacific and Broadway to McDougall and 32nd	Condition	n/a	2006 CSP	\$0.4
NE-2	McDougall from 33rd to 34th	Condition	n/a	2006 CSP	\$0.3
NE-3	34th from McDougall to Broadway	Condition	n/a	2006 CSP	\$0.1
NE-4	33rd to 34th between Broadway and McDougall	Condition	n/a	2006 CSP	\$0.4
NG-1	Grand Ave from 52nd St to 42nd St	Level of Service	<5 yrs	LOS	\$5.2
NG-2	Colby Ave from 40th St to Wall St	Pipe Age & Level of Service	5-10 Yr	LOS	\$4.5
NG-3	48th and 49th St from Black Forest Lane to Evergreen Way	Level of Service	< 5 Yr	LOS	\$2.4
NG-4	Lombard Ave from 33rd to 36th St	Pipe Age & Level of Service	< 5 Yr	LOS	\$2.0
NG-5	36th St Regulator to SRO8 Improvement	Improvement	n/a	LOS	\$1.5
TQ-1	State St from 23rd to 26th St	Level of Service	5-10 Yr	LOS	\$1.7
SE9-1	19th Ave SE	Improvement	n/a	2006 CSP	\$0.4
SE9-2	19th Ave SE	Improvement	n/a	2006 CSP	\$1.1
SE9-3	100th St SE	Improvement	n/a	2006 CSP	\$0.6
Eastm-1	Eastmont Gravity Sewer	New Service Area	n/a	2006 CSP	\$19.0
Eastm-2	Eastmont Forcemain	New Service Area	n/a	2006 CSP	\$1.1
Eastm-3	Eastmont Lift Station	New Service Area	n/a	2006 CSP	\$1.1
Total Collection and Conveyance Improvements					\$118.1

**Table 3-3. Summary of Improvement Projects for Each Basin
(costs presented in 2014 million dollars)**

Basin	10-year CIP	Beyond 10-Year CIP	Total Cost
A	\$0.0	\$2.4	\$2.4
C	\$9.3	\$5.2	\$14.5
D	\$32.5	\$3.1	\$35.6
G	\$4.4	\$7.0	\$11.4
E-M	\$9.0	\$0.0	\$9.0
P	\$6.2	\$0.0	\$6.2
N	\$0.0	\$3.3	\$3.3
NC	\$0.0	\$8.3	\$8.3
ND	\$0.0	\$47.3	\$47.3
NE	\$9.5	\$1.1	\$10.5
NG	\$2.9	\$15.6	\$18.5
T-Q	\$3.8	\$1.7	\$5.6
SE-7	\$0.0	\$0.0	\$0.0
SE-9	\$0.0	\$23.2	\$23.2
SW-1	\$0.0	\$0.0	\$0.0
WPCF	\$116.2	\$0.0	\$116.2
Programs	\$80.1	\$0.0	\$80.1
Total	\$274.0	\$118.1	\$392.1

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BASIN A

BASIN DESCRIPTION

Location	Northeastern most part of Everett bordered by Hawthorne Street, Old Highway 99, East Marine View Drive, and Snohomish River.
Area	381 acres
Sensitive Areas	Some areas with slope greater than 15%, Snohomish River
Major Arterials	East Marine View Drive, Broadway Aveue
Large Users	Riverside Business Park (LS)
Land Use	Mainly heavy and light industrial with some single family dwellings. At the north of the basin, the land use is maritime services. Multi-family residential at North area.
Future Development	Riverside Business Park



SANITARY SEWER FLOWS

Year 2013 (gpd)	239,221
Year 2036 (gpd)	297,904
Year 2100 (gpd)	444,028
Growth (2036) %	25%
Growth (2100) %	86%
Undeveloped parcels	106.44 acres 52 parcels)
Unsewered Areas	None

EXISTING SYSTEM

Combined or Sanitary	Combined
Total Length of Pipe	4.1 miles
Upstream Basins	None
Downstream Basins	None
Flow Meter	HDR-06 (4/12 - 12/12)
Receiving Facilities	LS 9 to Siphon Headworks
Existing Lift Stations	LS 9, Rvierside Business Park (Port of Everett) LS
Existing Diversion	R18 (Overflow from LS9)
CSO/SSO	SRO1
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	1.58
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	11.1

CIP

CIP ID	Description	Cost
	CIP Year 2015-2024	
	CIP Year 2024+	
A-1A	<p>East Marine View Dr North of Broadway</p> <p>Description: The proposed project would increase the diameter of 1,182 feet of 10-inch-diameter pipe to 15-inch, from SMH0895T14 to SMH0895Z02, along East Marine View Drive.</p> <p>Justification: Modeling analysis suggests the existing main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal.</p>	\$ 1,110,000
A-1B	<p>East Marine View Dr South of Broadway</p> <p>Description: This project would increase the diameter of 507 feet of 10-inch-diameter pipe to 15-inch, from SMH0895T14 to SMH0895Z02, along East Marine View Drive.</p> <p>Justification: Modeling analysis suggests the existing sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal.</p>	\$ 480,000

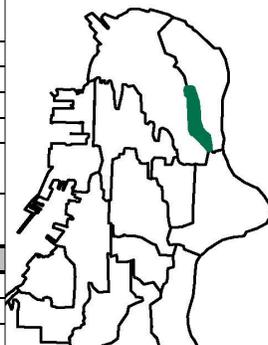
A-2A	<p>Belmonte Ln to Butler St</p> <p>Description: 905 feet of 8-inch-diameter pipe should be increased to 10-inch, from SMH0895Y13 to SMH0895Z02, along 160 feet of Butler Street and 745 feet in the alley between Pilchuck and East Marine View Drive.</p> <p>Justification: Modeling analysis suggests the sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal.</p>	\$ 680,000
A-2B	<p>Butler St West of Marine View Dr</p> <p>Description: 905 feet of 8-inch-diameter pipe should be increased to 10-inch, from SMH0895Y13 to SMH0895Z02, along 160 feet of Butler Street and 745 feet in the alley between Pilchuck and East Marine View Drive.</p> <p>Justification: Modeling analysis suggests the sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal.</p>	\$ 140,000
COMMENTS		
Note 1. All costs presented in this basin plan are in 2014 dollars.		

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BASIN B

BASIN DESCRIPTION

Location	Northeast Everett area bordered by East Marine View Drive, Chestnut Street, and 9th Street.
Area	35 acres
Sensitive Areas	None
Major Arterials	Marine View Drive, Chestnut
Large Users	
Land Use	Mainly residential (single family) and light industrial. Commercial zone along Chestnut Street.
Future Development	The future development in this area is mainly commercial and mixed-use commercial and multifamily, east of Chestnut Street.



SANITARY SEWER FLOWS

Year 2013 (gpd)	20,536
Year 2036 (gpd)	25,209
Year 2100 (gpd)	37,811
Growth (2036) %	23%
Growth (2100) %	84%
Undeveloped parcels	1.17 acres (4 parcels)
Unsewered Areas	None

EXISTING SYSTEM

Combined or Sanitary	Combined
Total Length of Pipe	1.2 mi
Upstream Basins	None
Downstream Basins	None
Flow Meter	None
Receiving Facilities	LS9 to Siphon Headworks
Existing Lift Stations	LS9
Existing Diversion	R18 (Overflow from LS9)
CSO/SSO	SRO1
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	0.16
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	3.2

CIP

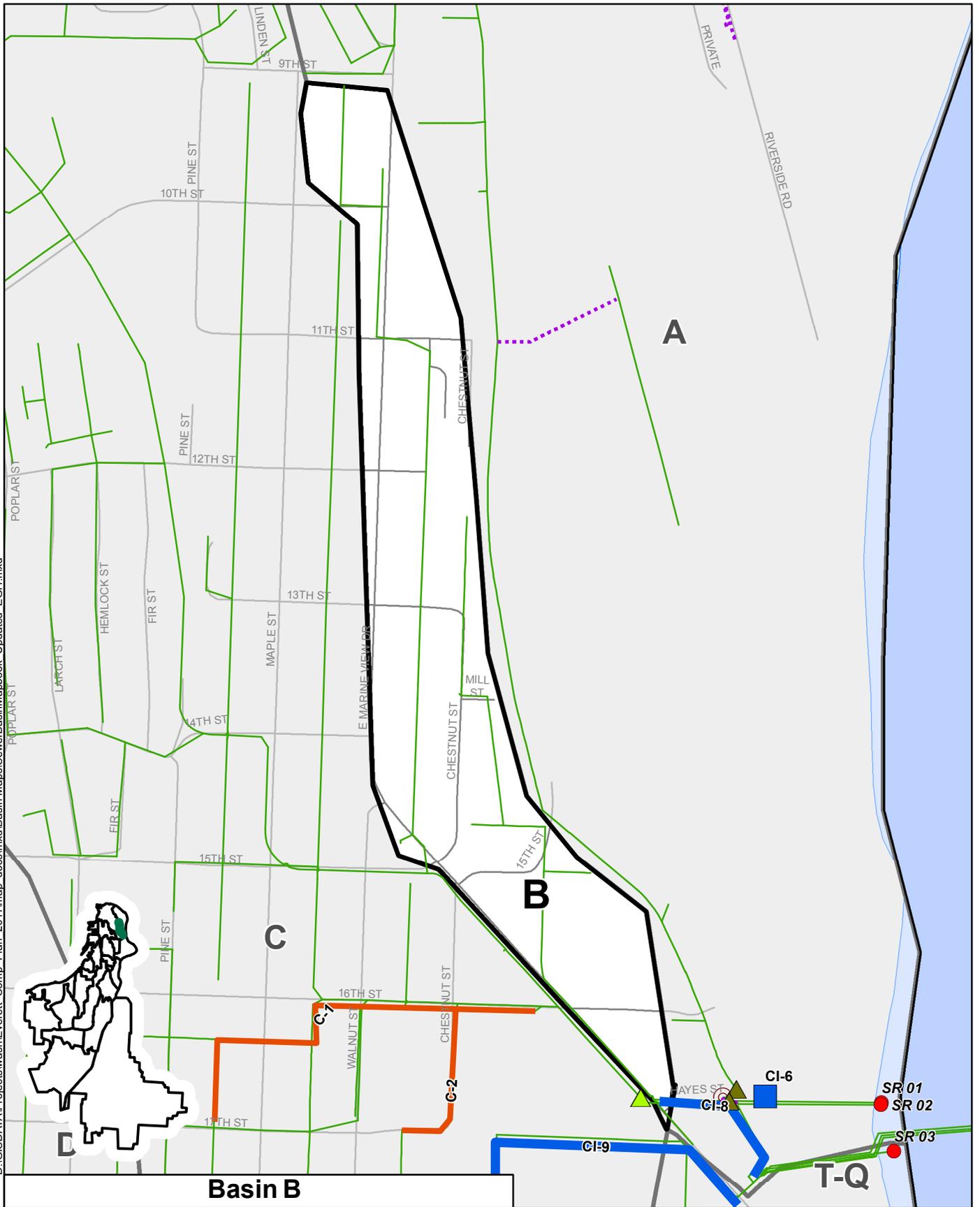
CIP ID	Description	Cost
	<i>CIP Year 2015-2024</i>	
	<i>CIP Year 2024+</i>	

COMMENTS

Note 1. All costs presented in this basin plan are in 2014 dollars.

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Basin B

Sewer Main	24" and over Force Main	10-Year CIP Facility
Regulator	Less than 24" Force Main	Sewer Main CIP beyond 10-Year
Weir	Sewer Basin	Facility
CSO Outfall	Water body	Sewer Main
Active City Sewer Lift Station	Street	
	Highway	
	Everett City Boundary	

1 inch = 483 feet

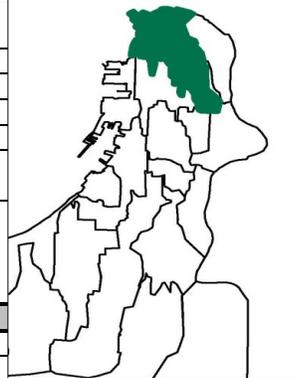
BASIN PLAN
City of Everett

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BASIN C

BASIN DESCRIPTION

Location	North Everett area; bordered by Puget Sound, East Marine View Drive, 9th Street, and 18th Street
Area	764 acres
Sensitive Areas	Wetlands; some slopes greater than 15%; shoreline
Major Arterials	Broadway, West Marine View Drive, 19th Street
Large Users	Everett Community College, Legion Memorial Golf Course, Port of Everett
Land Use	Mainly residential (single and multi family). Important commercial area along North Broadway Avenue. Maritime service area at the north of the basin.
Future Development	Mainly commercial and mixed-use commercial and multifamily, south of Broadway Avenue. Also some industrial growth is expected at the north end of the basin, north of Marine View Drive. The residential areas are expected to develop to their full land use designation.



SANITARY SEWER FLOWS

Year 2013 (gpd)	535,770
Year 2036 (gpd)	679,630
Year 2100 (gpd)	1,005,346
Growth (2036) %	27%
Growth (2100) %	88%
Undeveloped parcels	57.78 acres (67 parcels)
Unsewered Areas	None

EXISTING SYSTEM

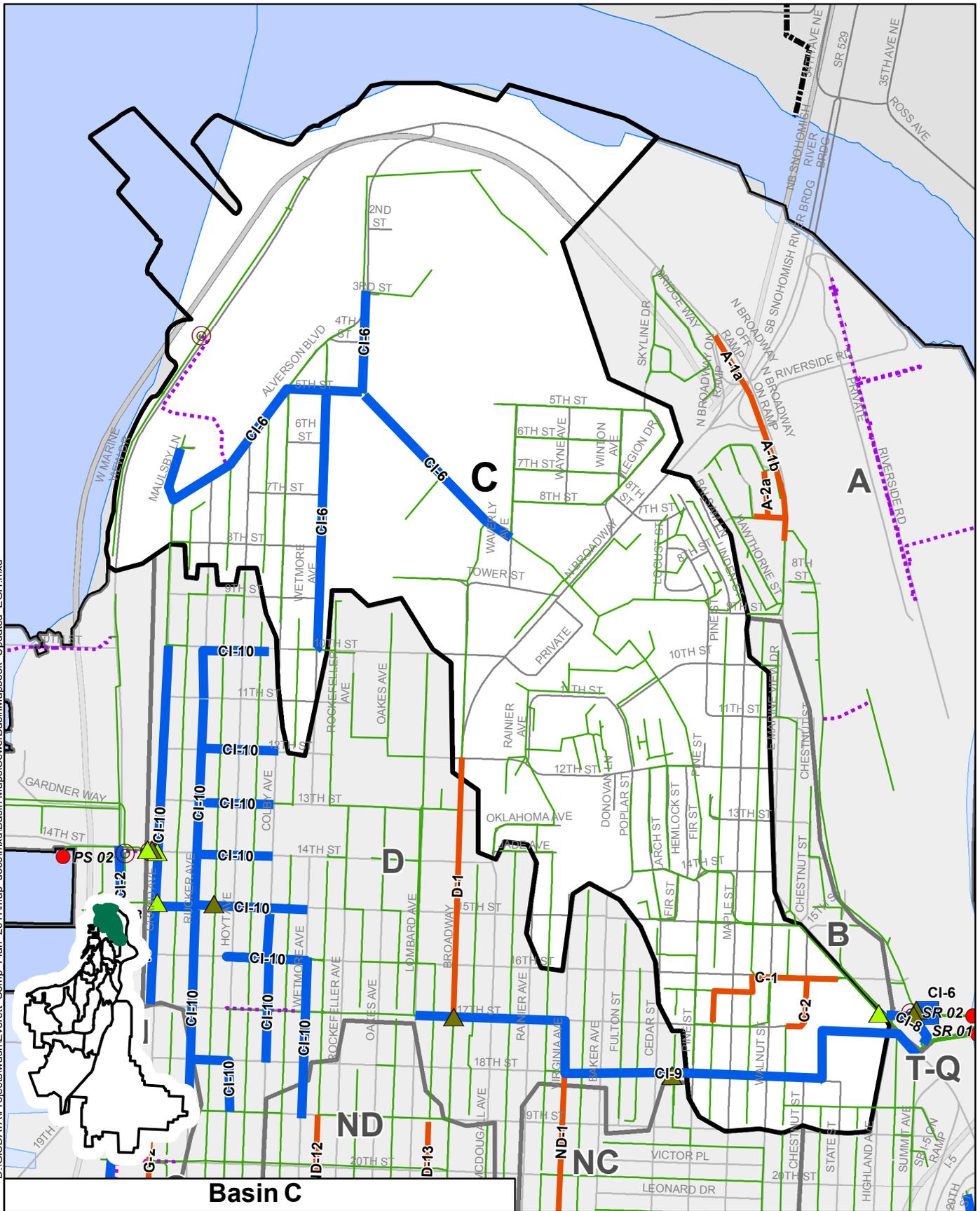
Combined or Sanitary	Combined
Total Length of Pipe	16.1 miles
Upstream Basins	None
Downstream Basins	None
Flow Meter	SFE 9 (1/09 - 4/10), 13 and 14 (1/09 - 12/12), HDR-09 and HDR-04 (4/12 - 12/12)
Receiving Facilities	Siphon Headworks
Existing Lift Stations	LS 31
Existing Diversion	None
CSO/SSO	R70 to SRO2, SRO3
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	3.28
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	87.9

CIP

CIP ID	Description	Cost
	CIP Year 2015-2024	
CI-6	<p>Sewer Project "N"</p> <p>Description: This project will address several different sewer and storm drainage issues:</p> <ul style="list-style-type: none"> • Eliminate basement flooding on Alverson Ave and Wetmore Ave., • Eliminate sewer backup problems at Rainier Hall at EvCC, • Improve "level of service" for sewer collection system in overall general area, • Separate storm water drainage and detain at Legion Golf Course and reuse for irrigation, • Reduce wet weather flow rate in C-Basin trunk (negate need for CIP project C-7?) • Reduce wet weather flows to siphon headworks and CSO overflows at SRO2, SRO3. <p>This project will require a pre-design phase to define and evaluate alternatives primarily through hydraulic and hydrologic modeling. Although the CIP projects listed below describe pipe upsizing/replacements, it is more likely that a separate storm water network will be more effective. A public-private partnership (City and EvCC) should be created in order to most cost-effectively solve the sewer flooding problems (Wetmore Ave and Rainier Hall). In addition, the Legion Golf Course can play an important role in furnishing and operating ponds for storm water detention and to the extent possible, utilize the storm water for irrigation on the golf course.</p> <p>Justification: The microburst rain events on August 29 and September 5/6, 2013 caused significant sewer flooding damage to the residential property in this neighborhood and Rainier Hall at EvCC.</p>	\$ 1,800,000

CI-7	<p>W Marine View Drive CSO Conveyance</p> <p>Description: Install a 48" stormwater pipeline from the western terminus of Grand Avenue Park Bridge at 16th Street and West Marine View Drive to the Deep Water Outfall connection point near 26th Street for conveyance of separated stormwater from the Sewer M (Northwest Neighborhood) and SR529 separated stormwater systems. Install a parallel 18" CSO line from Grand Avenue Park Bridge to the Port Gardner Wet Weather Storage facility located at 22nd Street for conveyance of overflows from Puget Sound Outfalls 1 and 2.</p> <p>Justification: The 2014 CSO Control Plan proposed an alternative strategy for compliance for the Port Gardner combined sewer outfalls. This alternative involves use of the Deep Water (Marine) Outfall to eliminate nearshore discharges of separated stormwater and combined sewer overflows. This project provides the link between the new pipelines located at the western terminus of the Grand Avenue Park Bridge and the historical secondary wastewater treatment plant on Kimberly-Clark property. The benefit of discharging to the Deep Water Outfall is that flows will be sent to a point 1,300 feet offshore at a depth of 350 feet instead of the nearshore river and marina waters. Currently nearshore areas are designated as MTCA cleanup sites.</p>	\$ 4,840,000
CI-8	<p>Hayes St Regulator and CSO Controls (SRO 1, 2, and 3)</p> <p>Description: This project will make various modifications to the existing CS/CSO system to control CSO overflows at SRO1, SRO2 and SRO3. In general, the existing system has various flow restrictions that are causing the CSO overflows. Sewer modeling by Otak and HDR have identified various alternatives but are recommending a series of improvements generally described as follows:</p> <ul style="list-style-type: none"> • Relocate the Hayes St. regulator structure to a lower elevation, adjacent to LS#9. Overflow from this regulator would go to SRO2. • Construct a new 72" dia. pipe from the new regulator structure to the siphon headworks. This will allow the maximum amount of flow to reach the siphon system and get conveyed to the WPCF prior to any CSO overflow occurring. • Wet weather flows from basins A and B that exceed the capacity of LS9, would overflow by gravity to the siphon headworks, but could also overflow to SRO1 if necessary. • Modifications to the east portion of the siphon headworks structure would be necessary to connect the 72" dia. pipe at a low elevation. <p>Justification: Currently the CSO overflows are regularly occurring in excess of one event per year at 2 of the 3 outfalls.</p>	\$ 2,700,000
CIP Year 2024+		
C-1	<p>18" vic 17th and Pine St to 16th and E Grand Ave</p> <p>Description: This project involves the replacement of approximately 1600 LF of sewer main with 18-inch pipe to increase conveyance capacity in the vicinity of 17th Street and Pine Street to 16th Street and Grand Ave from SMH1795Y13 to SMH1795S31.</p> <p>Justification: The sewer mains are 80-100 years old and may be candidates for condition replacement. Field evaluation should be conducted to determine the condition of the pipe. Modeling analysis suggests that main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation that the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	\$ 1,510,000
C-2	<p>Larch St from 12th to 14th</p> <p>Description: This project would increase 891 feet of 8- and 10-inch-diameter to 18-inch along 17th Street from SMH1795Z01 to SMH1795S08. The project area does not have reports of sewer backups.</p> <p>Justification: The sewer mains are 80-100 years old and may be candidates for condition replacement. Field evaluation should be conducted to determine the condition of the pipe.</p>	\$ 850,000
COMMENTS		
Note 1. All costs presented in this basin plan are in 2014 dollars.		

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Basin C

- | | | |
|--------------------------------|--------------------------|-------------------------------|
| Sewer Main | 24" and over Force Main | 10-Year CIP Facility |
| Regulator | Less than 24" Force Main | Sewer Main CIP beyond 10-Year |
| Weir | Sewer Basin | Facility |
| CSO Outfall | Water body | Sewer Main |
| Active City Sewer Lift Station | Street | |
| | Highway | |
| | Everett City Boundary | |

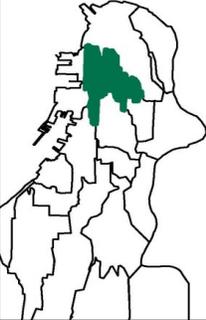
1 inch = 1,244 feet
 0 390 780 1,170
 Feet

BASIN PLAN
City of Everett

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BASIN D

BASIN DESCRIPTION

Location	Northwest of combined area, bordered by 9th Street, 1st Street, NW Grand Avenue and East Cedar Street	
Area	403 acres	
Sensitive Areas	None	
Major Arterials	17th Street, Broadway Avenue	
Large Users	Providence Hospital, Everett Community College	
Land Use	Mainly single detached residential units. A commercial area is located along Broadway Avenue. At the southwest of the basin, there is a multifamily area (15% of the basin).	
Future Development	This basin comprises the downtown Everett area, the growth projected in this area is low based on current level of development. Residential and multifamily parcels in the area were assumed to develop to their zoning and land use potential.	

SANITARY SEWER FLOWS

Year 2013 (gpd)	353,481
Year 2036 (gpd)	451,393
Year 2100 (gpd)	673,761
Growth (2036) %	28%
Growth (2100) %	91%
Undeveloped parcels	1.74 acres (52 parcels)
Unsewered Areas	None

EXISTING SYSTEM

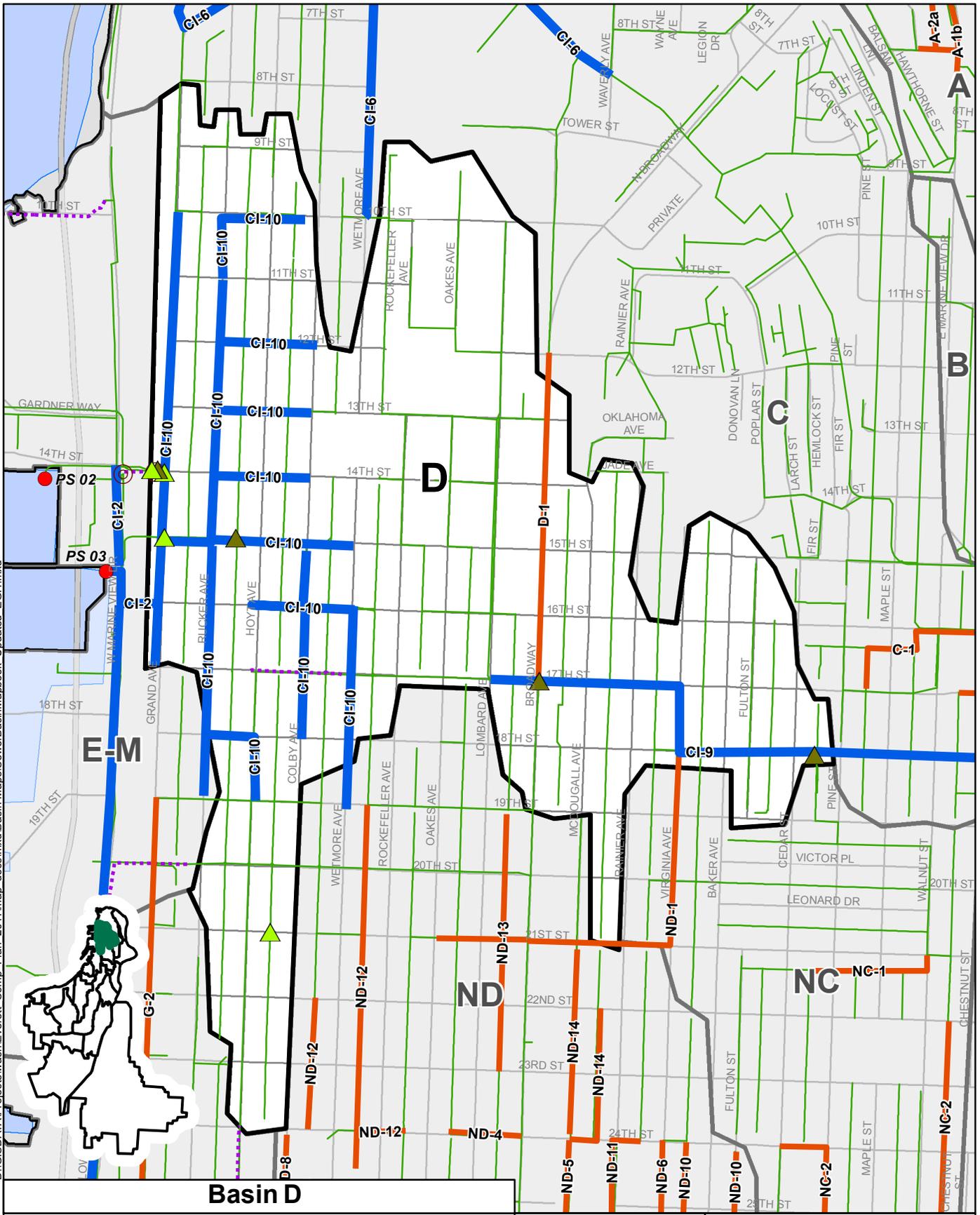
Combined or Sanitary	Combined
Total Length of Pipe	15.1 miles
Upstream Basins	E-M (except Navy Homeport) from LS 7
Downstream Basins	Basin NC during wet weather
Flow Meter	SFE 18 (1/09 - 4/11), SFE 6 (1/09 - 4/10), SFE 25 (5/10 - 4/12), SFE 30 (12/13 - Current), SFE 28, SFE 31
Receiving Facilities	Trunk D (17th Street Interceptor), Siphon Headworks
Existing Lift Stations	Western portion to LS8
Existing Diversion	R14 (low flow to Trunk D), R37 to PSO3, R17A from LS8 to PSO1 and PSO2. Sewer M will change flow routing to CSOs.
CSO/SSO	PSO1, 2, and SRO3 (siphon headworks)
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	2.30
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	192.7

CIP

CIP ID	Description	Cost
	CIP Year 2015-2024	
	Grand Ave Park Bridge	
CI-2	<p>Description: Phase 1 is the construction of the bridge and utility crossing. Phase 2 is the construction of the utilities north of the bridge along the highway up to, and into, the Port of Everett property for connections to PSO1 and PSO2. PSO3 will be completely replaced and repurposed as a stormwater outfall that is covered by the MS4 permit.</p> <p>Justification: Management has determined that the existing PSO3 pipe has been sufficiently damaged by the landslide that use of this pipe for conveyance of CS or storm water flows should be discontinued and that rehabilitation of the pipe would not be cost effective. The Sewer "M" project will generate separated storm water and depends on having a reliable outfall pipe connection to the bay and/or to K-C site (DWO).</p>	\$ 7,140,000

CI-9	<p>17th Street Interceptor</p> <p>Description: Approximately 6,300 LF of 30-inch - 60-inch pipe would be installed parallel to the existing 17th Street Interceptor. Leaping weirs at Broadway Avenue and 17th Street and Cedar and 18th Street would be removed. The profile of the new interceptor from Broadway Avenue to Cedar Street would be lowered to eliminate the existing 12-inch - 24-inch parallel conveyance sewer main. The alignment of the parallel interceptor would begin at SMH1795W11 and continue to the Siphon Headworks. The siphon headworks would be improved by removing the parshall flume and increasing the size of the structure to accommodate the new 96-inch interceptor and 72-inch pipe from the Hayes Street Regulator.</p> <p>Justification: Modeling suggests that the sewer main has a LOS of less than 5 years and there have been sewer backups reported in the project area. A study conducted byOTAK identified the improvement and additional analysis conducted by HDR during the CSP confirmed the recommendation. With more capacity in the interceptor, there are opportunities to convey a portion of Basin ND and NC's flow thereby reducing the flow conveyed to the Summit Ave Interceptor. Projects NC-3 and ND-1 would install new sewer mains that would increase the drainage basin to the 17th Street Interceptor.</p>	\$ 17,500,000
CI-10	<p>Sewer Project "M"</p> <p>Description: A new storm water collection network will be constructed to convey rain runoff to a flow splitter (regulator) at 15th St. which removes virtually all street and alley drainage from the sewer system thus eliminating basement flooding. By separating stormwater from the sewer system, CSO overflows at PSO1, PSO2 and PSO3 are expected to be reduced sufficiently to meet regulatory requirements. Many existing sewers, manholes, storm drain structures and side sewers in this area are very old and deteriorated, are undersized and/or have flat slopes and should be replaced soon. Approximately 12,120 LF of old combined sewer main and 500 side sewers could be replaced by this project. Streets that are impacted by the construction work may be replaced with full-width asphalt paving including new curbs and sidewalks where necessary. Some streets may be patched and overlaid. Alleys will re-paved with full-width asphalt. The pre-design effort has done a detailed condition assessment of streets and alleys in the project area.</p> <p>This project is also linked to the Grand Ave. Park Bridge project, UP3588. Design Consultant is Jacobs Engineering Group, Bellevue.</p> <p>Justification: "North Everett Combined Sewer Evaluation (Basin D) – Post June 9, 2010 Flood Event", March 2011, Otak, Inc. Alternative #9 outlines specific system modifications to address chronic basement flooding problems in the vicinity of Colby, Hoyt and 15th St.</p>	\$ 7,840,000
CIP Year 2024+		
D-1	<p>Broadway Ave from 17th St to 11th St</p> <p>Description: The project would replace approximately 2950 LF of sewer main with 18-inch - 24-inch pipe to increase conveyance capacity along Broadway Avenue from 11th Street to 17th Street from SMH1795M07 to SMH1795W14.</p> <p>Justification: The existing sewer main is over 100 years old and may be candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe. Modeling analysis of the system suggests the main has less than 5 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	\$ 3,100,000
COMMENTS		
Note 1. All costs presented in this basin plan are in 2014 dollars.		

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Basin D

	Sewer Main		24" and over Force Main		10-Year CIP Facility
	Regulator		Less than 24" Force Main		Sewer Main CIP beyond 10-Year
	Weir		Sewer Basin		Facility
	CSO Outfall		Water body		Sewer Main
	Active City Sewer Lift Station		Street		
			Highway		
			Everett City Boundary		

1 inch = 985 feet

0 310 620 930 Feet

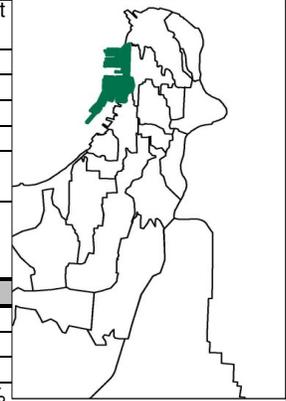
BASIN PLAN
City of Everett

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BASIN E-M

BASIN DESCRIPTION

Location	West of combined area, bordered by 8th street, Grand Avenue, 23rd Street, and Puget Sound
Area	327 acres
Sensitive Areas	Some slopes greater than 15%, Puget Sound
Major Arterials	West Marine View Drive, Grand Avenue
Large Users	Port of Everett (US Naval Station Everett to Basin ND)
Land Use	Heavy industrial and maritime services are the land uses west of Marine View Drive. Along the east, the land use is mainly residential.
Future Development	The growth in this area will be mainly industrial, west of Marine View Drive. Commercial growth expected east of Marine View Drive. Detailed information about future large users was not available.



SANITARY SEWER FLOWS

Year 2013 (gpd)	191,099
Year 2036 (gpd)	245,583
Year 2100 (gpd)	364,280
Growth (2036) %	29%
Growth (2100) %	91%
Undeveloped parcels	12.23 acres (27 parcels)
Unsewered Areas	None

EXISTING SYSTEM

Combined or Sanitary	Combined
Total Length of Pipe	3.5 miles
Upstream Basins	None
Downstream Basins	Basin D
Flow Meter	None
Receiving Facilities	Trunk D to Siphon Headworks
Existing Lift Stations	LS 6, LS 7, and LS 8 pump to Trunk D, (Navy Homeport LS to Basin ND)
Existing Diversion	R36 to PSO2. Sewer M and Grand Avenue Park Bridge projects will change routing to CSOs.
CSO/SSO	PSO1, PSO2, and PSO3
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	1.32
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	undefined

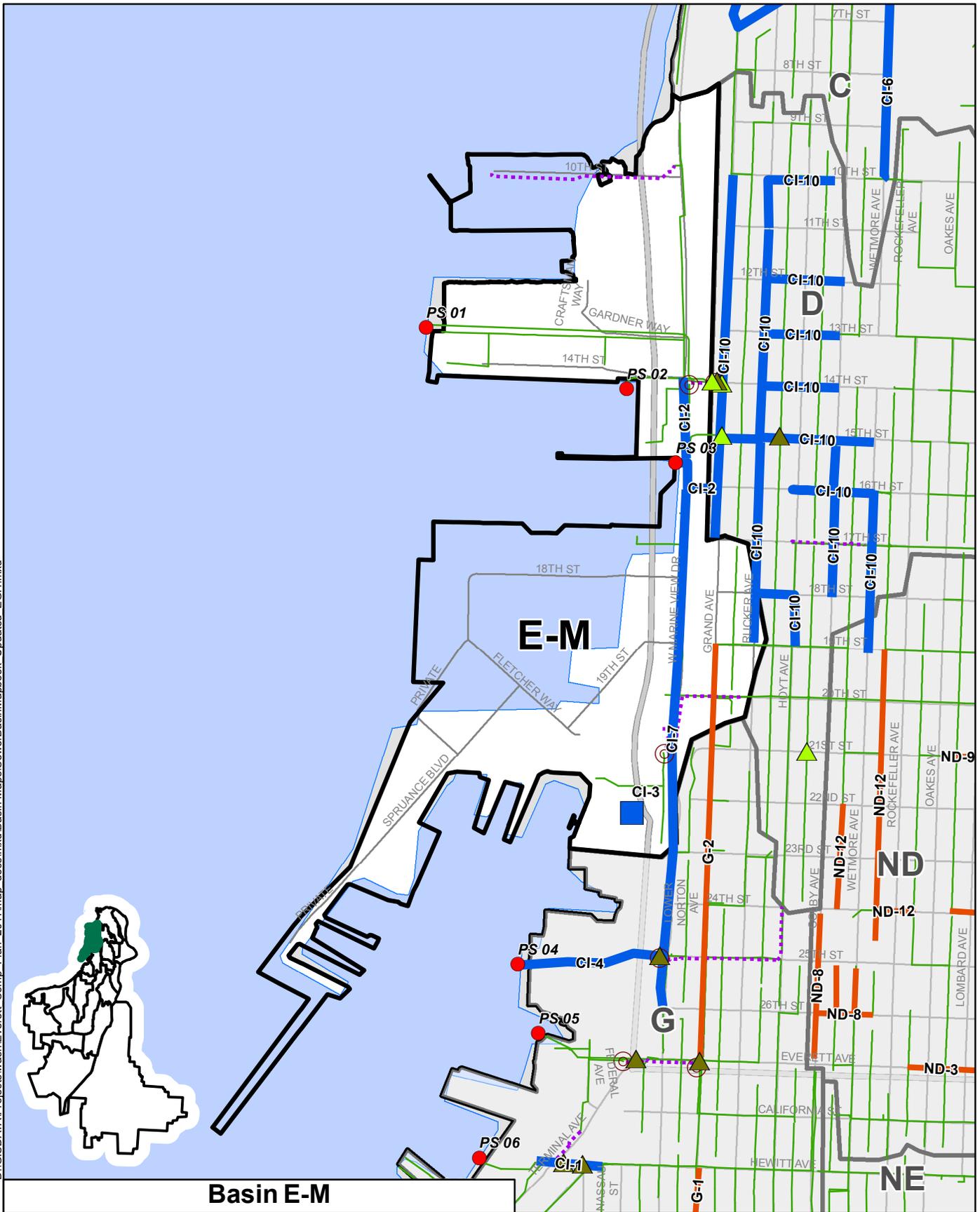
CIP

CIP ID	Description	Cost
CIP Year 2015-2024		
CI-3	<p>Port Gardner Wer Weather Storage (K/C Site)</p> <p>Description: Purchase approximately 3 acres of the former KC Facilities and convert the aeration basins and potentially one clarifier to wet weather storage facility to meet the NPDES CSO control requirements instead of constructing the Bond Street CSO control facilities. The project also includes all the conveyance piping required to operate the storage facility.</p> <p>Justification: This option was presented to Ecology in the 2014 CSO Control Plan Update as the preferred option for controlling CSO's from PSOs 4 – 7. The project should be on-line by 2027.</p>	\$ 9,000,000
CIP Year 2024+		

COMMENTS

Note 1. All costs presented in this basin plan are in 2014 dollars.

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Basin E-M

Sewer Main	24" and over Force Main	10-Year CIP Facility
Regulator	Less than 24" Force Main	Sewer Main CIP beyond 10-Year
Weir	Sewer Basin	Facility
CSO Outfall	Water body	Sewer Main
Active City Sewer Lift Station	Street	
	Highway	
	Everett City Boundary	

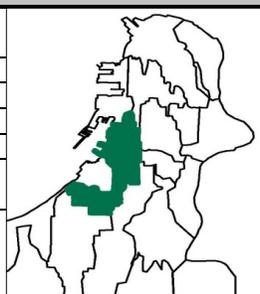
1 inch = 1,230 feet

BASIN PLAN
City of Everett

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BASIN G

BASIN DESCRIPTION

Location	Port Gardner area southwest of combined area; bounded by 21st Street, Colby Ave, Mukilteo Blvd, and Puget Sound	
Area	581 acres	
Sensitive Areas	Puget Sound	
Major Arterials	Hewitt Avenue, East Marine View Drive, Pacific Avenue	
Large Users	Forest Park, Everett Terminal, Providence Hospital-Pacific	
Land Use	Mainly commercial (north of Pacific Avenue) and residential (multifamily with some single detached).	
Future Development	The main development in this area is expected to be in the Central Business District, at the north end of the basin, east of Terminal Avenue. Some heavy industrial growth west of Terminal Avenue is also expected. Residential parcels are expected to develop to their full potential.	

SANITARY SEWER FLOWS

Year 2013 (gpd)	574,235
Year 2036 (gpd)	817,429
Year 2100 (gpd)	1,320,813
Growth (2036) %	42%
Growth (2100) %	130%
Undeveloped parcels	3.04 acres (20 parcels)
Unsewered Areas	1 acre (3 parcels)

EXISTING SYSTEM

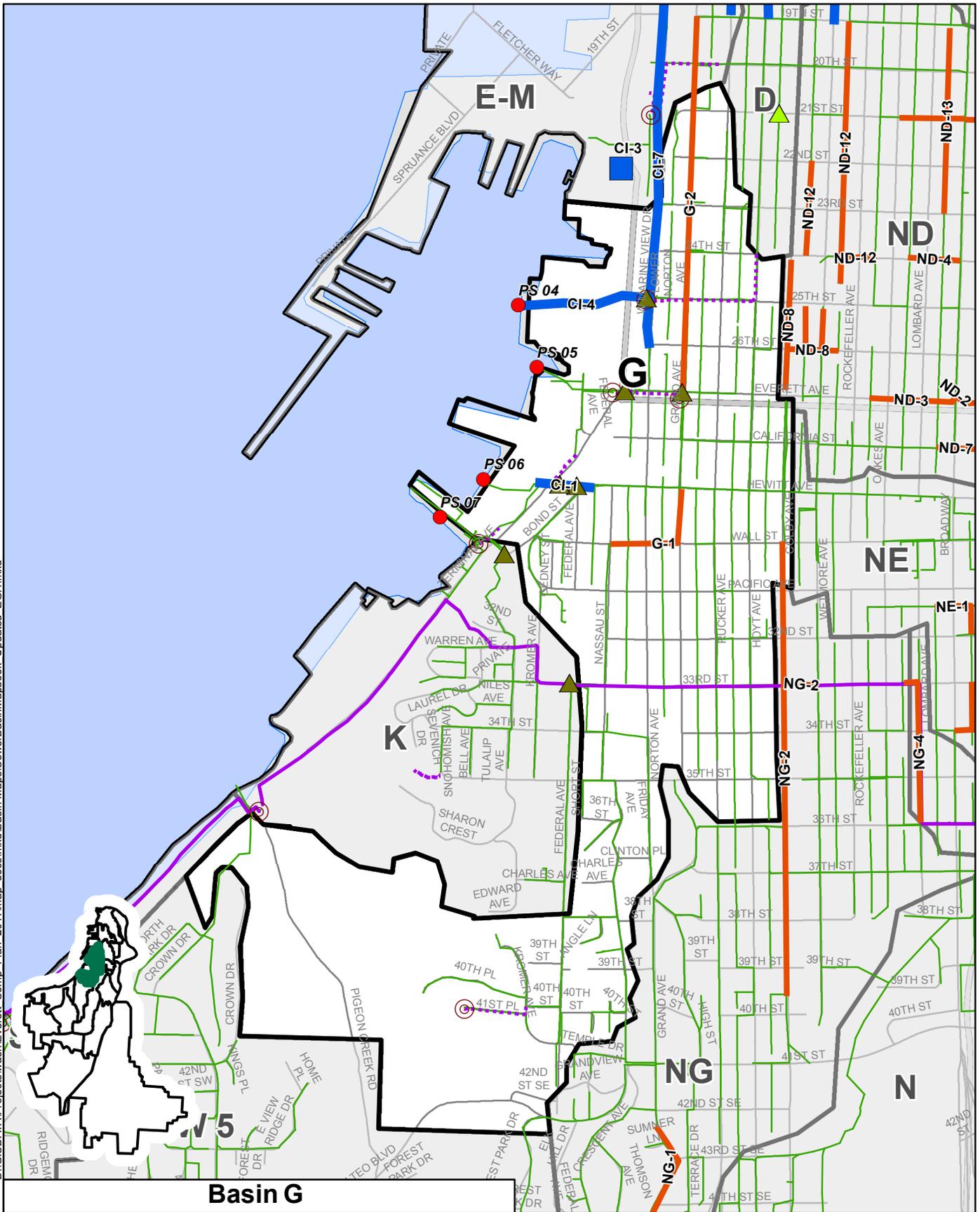
Combined or Sanitary	Combined
Total Length of Pipe	18.1 miles
Upstream Basins	None
Downstream Basins	None
Flow Meter	SFE 12A and 12B (1/09 - 12/12), HDR-02 (4/12 - 12/12)
Receiving Facilities	LS4, LS5, LS2, Trunk D
Existing Lift Stations	LS2, LS3, LS4, LS5, lift station system pumping to Trunk D (17th Street Interceptor) (Basin D)
Existing Diversion	R20 (diverts flow to PS04), R21 (controls the flow to LS 04), R7 (Controls the flow to LS 03), R43 (diverts the flow to PS05), R8 (control the flow to PS06), R40 and R40A (diverts the flow to PS07), R50 will be removed. A flow diversion was construction in 2014 to divert flow from the South portion of Basin G to Hewitt Avenue and Bond Street sewer mains.
CSO/SSO	PSO4, PSO5, PSO6, and PSO7
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	4.16
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	126.4

CIP

CIP ID	Description	Cost
	CIP Year 2015-2024	
CI-1	<p>Combined Sewer Outfalls (PSO6) Relocation</p> <p>Description: In 2012, City staff performed a TV inspection of Puget Sound Outfall No. 6 (PSO6) and encountered concrete blocking three-quarters of the combined sewer outfall pipeline. Subsequently a survey and conceptual plan to route a new pipe around the concrete pipe was developed along with a cost estimate. The Port of Everett is the landowner and has agreed to equally split the cost of this repair. In 2014 BNSF approached the City about replacing the elevated rail crossing over PSO6 with fill. BNSF engineers are currently completing design of that effort and the resulting changes to PSO6 at that location. Additionally City staff has developed a concept that would attempt to separate the Port's stormwater drainage from the rerouted PSO6. Further evaluation of this concept needs to be completed as well as additional discussions with the Port of Everett. Structural engineering support was determined to be needed for the PSO6 reroute for conflicts with tiebacks located at the bulkhead.</p> <p>Justification: The Port of Everett has experienced flooding to a trailer at this location. The location of the concrete is in a portion of the outfall pipeline that acts as a siphon. Both the City and the Port need the capacity of this outfall restored.</p>	\$ 380,000

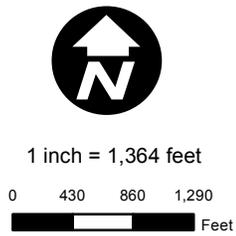
CI-4	<p>PSO4 Relocation for K/C Site</p> <p>Description: Puget Sound Outfall 4 currently receives both combined sewer overflows from CSO regulators located at Lift Station No. 5 and separated stormwater from SR529 and a former Kimberly-Clark parking lot. This project provides for the replacement and relocation of this outfall in conjunction with property sale by Kimberly-Clark and redevelopment by the buyer.</p> <p>Justification: Inspection of the outfall pipe revealed that it was severely restricted in size underneath the BNSF railway that is adjacent to Lift Station No. 5, compared to the remainder of the pipeline through the former K-C mill. This restriction along with up to six successive 90 degree bends installed in the outfall by the former Kimberly-Clark mill unnecessarily restricts the capacity of the outfall to convey combined sewer overflows. Modeling indicates that stormwater flows come backwards across the CSO weirs causing reportable CSO events that otherwise would not occur had the pipeline not had the above-mentioned restrictions.</p>	\$ 4,000,000
CIP Year 2024+		
G-1	<p>Nassau Ave & Wall St to Grand Ave & Hewitt St</p> <p>Description: The project would replace approximately 1350 LF of sewer main with 18-inch pipe to increase conveyance capacity from Nassau Street and Wall Street to W Grand Avenue and Hewitt Ave from SMH3095B04 to SMH1995Y09.</p> <p>Justification: Modeling analysis suggests the existing sewer mains have a 5 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal.</p>	\$ 1,270,000
G-2	<p>Grand Ave from Everett Ave to 19th St</p> <p>Description: The project would replace approximately 3950 LF of sewer main with 24-inch pipe to increase conveyance capacity along W Grand Avenue from 19th Street to Everett Ave from SMH1995B05 to SMH1995T13.</p> <p>Justification: Modeling analysis suggests the existing sewer mains have 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal.</p>	\$ 5,760,000
COMMENTS		
Note 1. All costs presented in this basin plan are in 2014 dollars.		

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Basin G

- | | | |
|--------------------------------|--------------------------|-------------------------------|
| Sewer Main | 24" and over Force Main | 10-Year CIP Facility |
| Regulator | Less than 24" Force Main | Sewer Main CIP beyond 10-Year |
| Weir | Sewer Basin | Facility |
| CSO Outfall | Water body | Sewer Main |
| Active City Sewer Lift Station | Street | |
| | Highway | |
| | Everett City Boundary | |



BASIN PLAN City of Everett

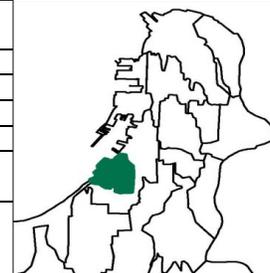


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BASIN K

BASIN DESCRIPTION

Location	Southwest of combined area, Port Gardner area; bordered by Wall Street, Edwards Avenue, Federal Avenue, and Puget Sound
Area	202 acres
Sensitive Areas	Significant areas with slope greater than 15%; Puget Sound
Major Arterials	West Marine View Drive, 33rd Street, Federal Avenue
Large Users	
Land Use	Mainly residential (single family) with heavy industrial at the northwest end of the basin, and public facilities south of Snohomish Avenue.
Future Development	The main growth is expected due to development to full capacity in the residential area. The undeveloped parcels are mainly in heavy industrial areas, west of Marine View Drive.



SANITARY SEWER FLOWS

Year 2013 (gpd)	186,872
Year 2036 (gpd)	276,356
Year 2100 (gpd)	453,967
Growth (2036) %	48%
Growth (2100) %	143%
Undeveloped parcels	31.80 acres (36 parcels)
Unsewered Areas	8 acres (10 parcels)

EXISTING SYSTEM

Combined or Sanitary	Combined
Total Length of Pipe	3.9 miles
Upstream Basins	None
Downstream Basins	None
Flow Meter	SFE 27 (6/11 - 12/12). SHE 32 (12/13 to 11/14)
Receiving Facilities	LS 02 pumping to Trunk D (through LS 04)
Existing Lift Stations	1 small local lift station (not included in the model), LS 02
Existing Diversion	R40 to PSO7
CSO/SSO	PSO7
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	1.61
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	37.2

CIP

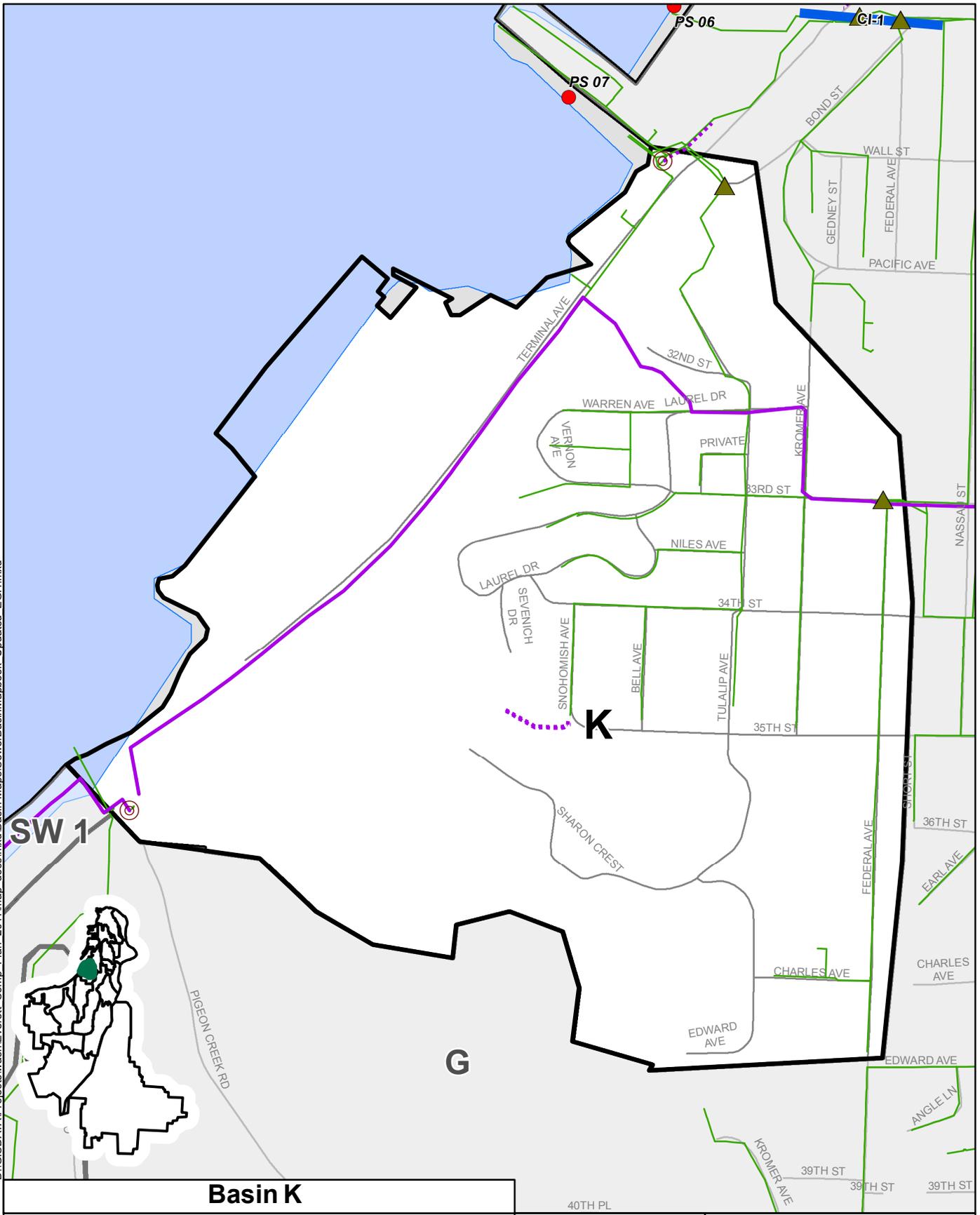
CIP ID	Description	Cost
	<i>CIP Year 2015-2024</i>	
	<i>CIP Year 2024+</i>	

COMMENTS

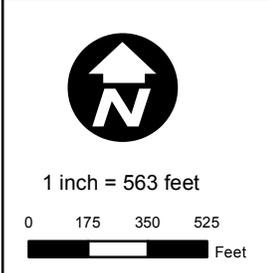
Note 1. All costs presented in this basin plan are in 2014 dollars.

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Basin K		
Sewer Main	24" and over Force Main	10-Year CIP Facility
Regulator	Less than 24" Force Main	Sewer Main CIP beyond 10-Year
Weir	Sewer Basin	Facility
CSO Outfall	Water body	Sewer Main
Active City Sewer Lift Station	Street	
	Highway	
	Everett City Boundary	



BASIN PLAN
City of Everett

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BASIN N

BASIN DESCRIPTION

Location	North of sanitary area, east of Glacier View area; bordered by 35th Street, Delaware Avenue, 3rd Avenue, and 52nd Street SE	
Area	699 acres	
Sensitive Areas	Wetlands; Significant slopes greater than 15%; Snohomish River	
Major Arterials	I-5	
Large Users	Evergreen Cemetery	
Land Use	Mainly residential (single family), some light industrial, multifamily and cemeteries at the north end of the basin. Commercial area 41st Street an I-5 area.	
Future Development	The main growth in this basin is expected to be industrial and commercial, east of I-5. The residential area is expected to develop to its full potential.	

SANITARY SEWER FLOWS

Year 2013 (gpd)	260,395
Year 2036 (gpd)	351,459
Year 2100 (gpd)	557,951
Growth (2036) %	35%
Growth (2100) %	114%
Undeveloped parcels	21.17 acres (131 parcels)
Unsewered Areas	none

EXISTING SYSTEM

Combined or Sanitary	Combined
Total Length of Pipe	17.8 miles
Upstream Basins	None
Downstream Basins	Basin P, T-Q
Flow Meter	SFE 37A (12/13 - Current)
Receiving Facilities	Summit Avenue and Memorial Stadium Interceptors, LS17 to South End Interceptor
Existing Lift Stations	Area east of I-5 to LS17
Existing Diversion	R60 to R64 to SRO8 or R61 to R11 to SRO7
CSO/SSO	None
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	1.94
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	89.3

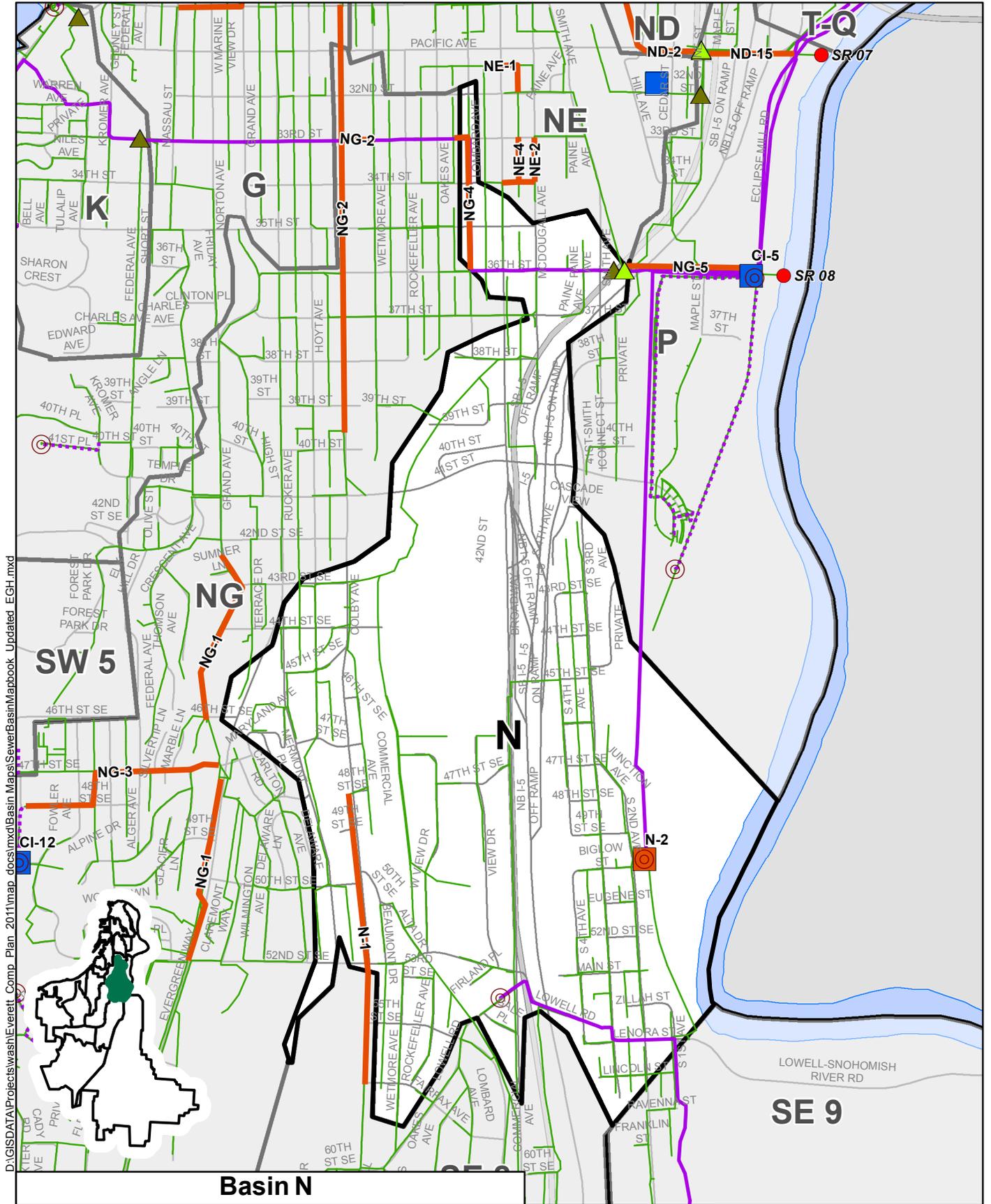
CIP

CIP ID	Description	Cost
	CIP Year 2015-2024	
	CIP Year 2024+	
N-1	<p>Colby Ave from Fairfax Ave to 48th St SE</p> <p>Description: The project would replace approximately 3300 LF of sewer main with 12-inch pipe to increase conveyance capacity along Colby Avenue from Fairfax to 48th Street SE from SMH0585E03 to SMH3195R12.</p> <p>Justification: Modeling analysis suggests the sewer main has less than a 5 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal.</p>	\$ 3,160,000
N-2	<p>Lift Station 17 Improvements</p> <p>Description: This project would reinforce the bearing wall supports used to lift pumps.</p> <p>Justification: The bearing wall lacks support to lift pumps.</p>	\$ 100,000

COMMENTS

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Basin N

- | | | |
|--------------------------------|--------------------------|-------------------------------|
| Sewer Main | 24" and over Force Main | 10-Year CIP Facility |
| Regulator | Less than 24" Force Main | Sewer Main CIP beyond 10-Year |
| Weir | Sewer Basin | Facility |
| CSO Outfall | Water body | Sewer Main |
| Active City Sewer Lift Station | Street | |
| | Highway | |
| | Everett City Boundary | |

1 inch = 1,443 feet

0 450 900 1,350 Feet

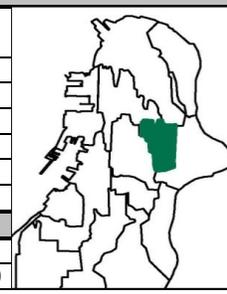
BASIN PLAN

City of Everett

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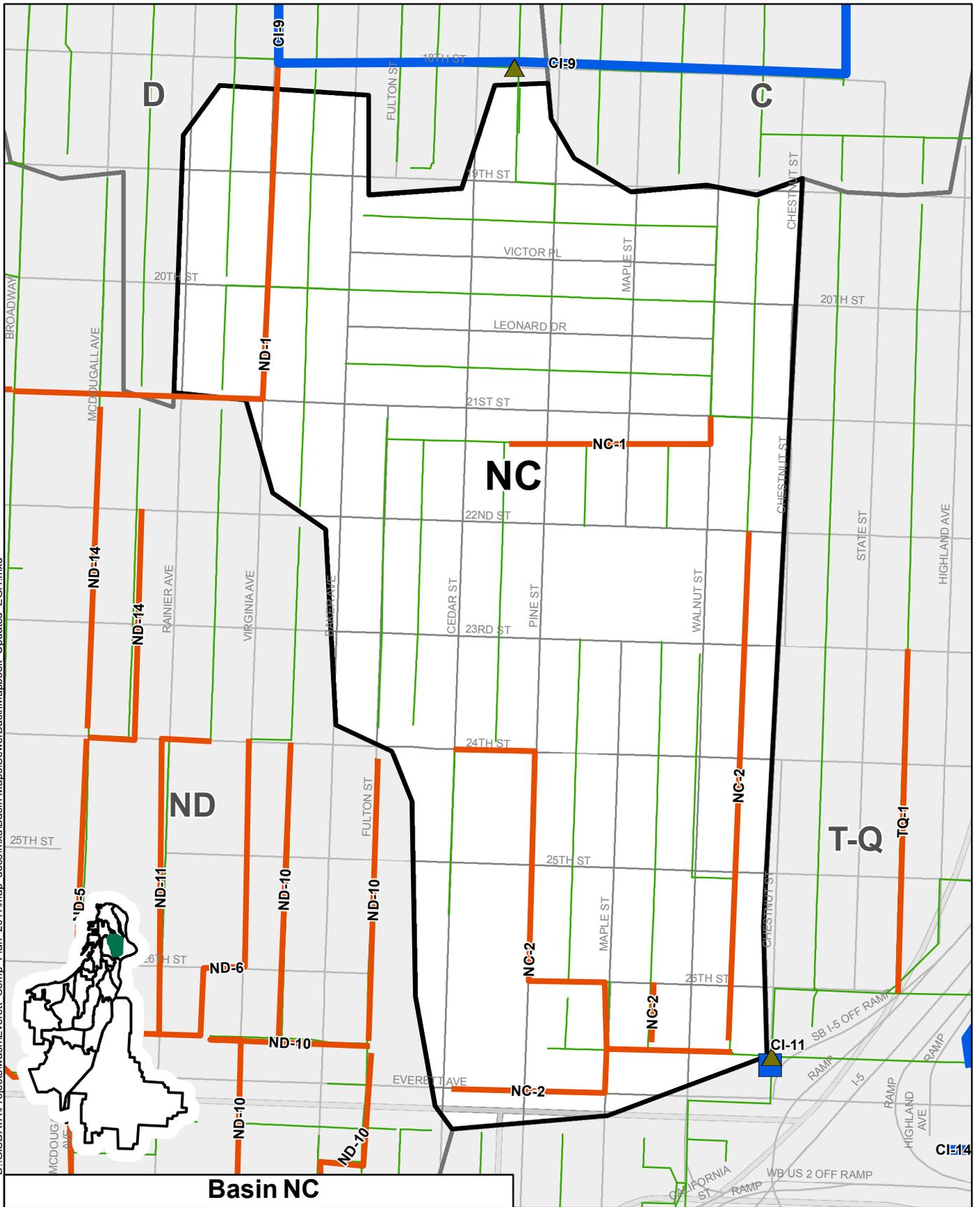
BASIN NC

BASIN DESCRIPTION		
Location	Southeast of combined area, east of Riverside; bordered by Chestnut Street, 19th Street, Everett Avenue, and Rainier Avenue.	
Area	183 acres	
Sensitive Areas	None	
Major Arterials	Chestnut Avenue	
Large Users		
Land Use	Mostly single family with churches and schools.	
Future Development	Residential area is expected to develop to its full land use designation.	
SANITARY SEWER FLOWS		
Year 2013 (gpd)		125,821
Year 2036 (gpd)		170,300
Year 2100 (gpd)		270,286
Growth (2036) %		35%
Growth (2100) %		115%
Undeveloped parcels	.99 acres (10 parcels)	
Unsewered Areas	None	
EXISTING SYSTEM		
Combined or Sanitary	Combined	
Total Length of Pipe	6.0 miles	
Upstream Basins	Basin D (From R2)	
Downstream Basins	T-Q	
Flow Meter	HDR-11 (4/12 - 12/12)	
Receiving Facilities	Summit Ave Interceptor to Summit Tunnel to Siphon Headworks	
Existing Lift Stations	LS32 from R4	
Existing Diversion	R4 (Chestnut Street and 26th Street, controls if the flow from Basin NC goes to LS32 or to the Trunk N interceptor), R2 (18th Street between Cedar and Pine Streets, diverts the flow from Basin D).	
CSO/SSO	SRO4	
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	1.01	
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	43.4	
CIP		
CIP ID	Description	Cost
	<i>CIP Year 2015-2024</i>	
CI-11	<p>Regulator 4 & R39 Modification</p> <p>Description: This project would remove the leaping weir in Regulator R4 near Chestnut Street and Everett Avenue and install a flat weir in the structure.</p> <p>Justification: Modeling analysis suggests this regulator would divert wet weather flow from Basin NC to Lift Station 32 and contribute to CSO events at SRO4. By replacing the leaping weir with a flat weir, the capacity of the Summit Avenue Interceptor would be maximized before flow would discharge to Lift Station 32. This improvement is anticipated to reduce CSO events at SRO4.</p>	\$ 300,000
	<i>CIP Year 2024+</i>	
NC-1	<p>21st St from Pine St to Walnut St</p> <p>Description: This project would replace approximately 1000 LF of sewer main with 24-inch pipe to increase conveyance capacity along Pine Street from 21st Street to Walnut Street from SMH2095G24 to SMH2095H04.</p> <p>Justification: Modeling analysis of the existing sewer mains suggests that they have a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal. An opportunity has been identified to include GSI improvements with this project. GSI improvements would be evaluated as part of the GSI Improvement Program.</p>	\$ 1,460,000



<p>NC-2</p>	<p>vic 24th St to Pine St to 26th St to Maple St to Everett Ave</p> <p>Description: The project would install approximately 5720 LF of 8-inch - 30-inch sewer main to increase conveyance capacity and replace aging pipe along 24th St, Pine St, 26th St, Maple St, and Everett Ave. The project includes multiple segments of pipe from SMH2095K06, SMH2095T06, SMH2095Q09, and SMH2095H06 that all drain to SMH2095S04.</p> <p>Justification: The existing sewer mains in the project area are over 100 years old and may be candidates for condition replacement. Field evaluation should be conducted to determine the condition of the pipe. Modeling analysis also suggests the sewer mains have a LOS of 5-10 years. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement. An opportunity has been identified to include GSI improvements with this project. GSI improvements would be evaluated as part of the GSI Improvement Program.</p>	<p>\$ 6,800,000</p>
COMMENTS		
<p>Note 1. All costs presented in this basin plan are in 2014 dollars.</p>		

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Basin NC

Sewer Main	24" and over Force Main	10-Year CIP Facility
Regulator	Less than 24" Force Main	Sewer Main CIP beyond 10-Year
Weir	Sewer Basin	Facility
CSO Outfall	Water body	Sewer Main
Active City Sewer Lift Station	Street	
	Highway	
	Everett City Boundary	



1 inch = 563 feet



BASIN PLAN

City of Everett

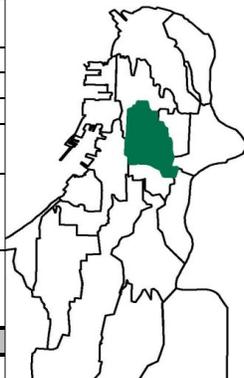



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BASIN ND

BASIN DESCRIPTION

Location	South of combined area, between Bayside and Riverside; bordered by 18th Street, Colby Avenue, Fulton Street, and Hewitt Avenue.
Area	377 acres
Sensitive Areas	Some slopes greater than 15%
Major Arterials	Broadway Avenue, California Avenue
Large Users	Everett High School; Central Business District; North Middle School, Navy Homeport
Land Use	The two main uses of this basin are commercial (Central Business District) south of 25th street and along Broadway Avenue, and residential (single family). There is some multifamily areas along Everett Avenue.
Future Development	The expected growth for this basin is mainly commercial in the Central Business District. Residential areas are expected to develop to their full land use designation.



SANITARY SEWER FLOWS

Year 2013 (gpd)	377,308
Year 2036 (gpd)	505,098
Year 2100 (gpd)	789,841
Growth (2036) %	34%
Growth (2100) %	109%
Undeveloped parcels	4.52 acres (32 parcels)
Unsewered Areas	None

EXISTING SYSTEM

Combined or Sanitary	Combined
Total Length of Pipe	13.2 miles
Upstream Basins	Basin D, Navy Homeport
Downstream Basins	None
Flow Meter	SFE 19 (1/09 - 4/10), SFE 24A and 24B (5/10 - 12/12), HDR-03 and HDR-05 (4/12 - 12/12)
Receiving Facilities	Summit Avenue Interceptor
Existing Lift Stations	Navy LS
Existing Diversion	R11 (diverts flow to Summit Avenue Interceptor), R1 (flow from Basin D).
CSO/SSO	R61 to R11 to SRO7 or R60 to R64 to SRO8
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	2.65
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	210.9

CIP

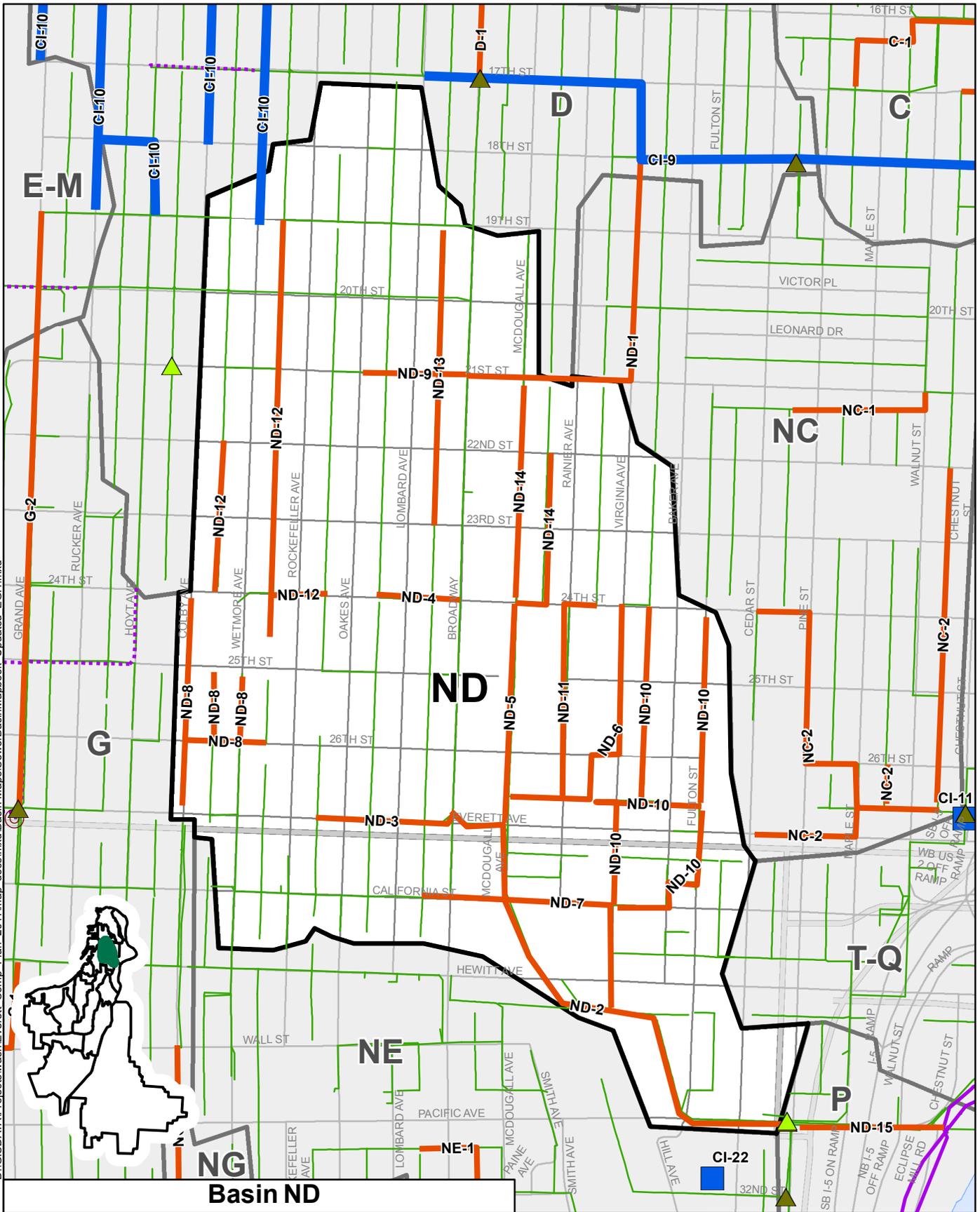
CIP ID	Description	Cost
	CIP Year 2015-2024	
	CIP Year 2024+	
ND-1	<p>21St St to 17th St. Interceptor</p> <p>Description: The project would install approximately 2500 LF of 54-inch sewer main from 21st and Broadway to the new 17th Street Interceptor from SMH2095E08 to SMH1795X11.</p> <p>Justification: This project is an opportunity to convey a portion of Basin ND's flow into the new 17th Street Interceptor. Based on the geometry of the existing trunk main along Broadway Ave, a new sewer main could collect flow from 21st and Broadway and route it to the new 17th Street Interceptor. This would revise the basin boundary of Basin ND and reduce flow in the existing Broadway Avenue trunk sewer. This would also reduce flow to the Summit Avenue Interceptor, Snohomish River CSO Interceptor, and SRO7. Modeling analysis suggests a LOS of 5 – 10 years in the Basin ND trunk sewer and tributary sewers. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal.</p>	\$ 7,340,000

ND-2	<p>Broadway Trunk Main Improvement</p> <p>Description: Approximately 3700 LF of sewer main would be replaced with 60-inch and 72-inch pipe to increase conveyance capacity in the Broadway Trunk main from SMH2095V12 to the Pacific Regulator.</p> <p>Justification: A majority of the existing sewer main is over 100 years old and may be a candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe. Modeling analysis suggests the existing sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement. In-line storage could be evaluated to limit peak flow rates to the Pacific Regulator that can contribute to CSO events at SRO7.</p>	\$ 13,450,000
ND-3	<p>Everett Ave from Rockefeller Ave to Broadway Ave</p> <p>Description: The project would replace approximately 950 LF of sewer main with 24-inch pipe to increase conveyance capacity on Everett Ave from SMH2095V02 to SMH2095V12.</p> <p>Justification: The existing sewer main is 80-100 years old and may be a candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe. Modeling analysis indicated the existing sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	\$ 1,160,000
ND-4	<p>24th St from Oakes Ave to Broadway Ave</p> <p>Description: Replacement of approximately 550 LF of sewer main with 18-inch pipe would increase conveyance capacity along 24th Street from Oakes to Broadway Ave from SMH2095M04 to SMH2095M11.</p> <p>Justification: Modeling analysis suggests the existing sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal.</p>	\$ 540,000
ND-5	<p>McDougall Ave from Everett Ave to 24th St</p> <p>Description: The project would replace approximately 1550 LF of sewer main with 24-inch through 42-inch pipe to increase conveyance capacity along McDougall from Everett Avenue to 24th Street from SMH2095L02 to SMH2095U02.</p> <p>Justification: The existing sewer main is 80-100 years old and may be a candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe. Modeling analysis suggests the sewer main has a LOS less than 5 years. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	\$ 1,670,000
ND-6	<p>Virginia Ave & 24th St to McDougall vic Everett Ave</p> <p>Description: Approximately 2050 LF of sewer main would be replaced with 24-inch pipe to increase conveyance capacity from Virginia Avenue and 24th Street to McDougall near Everett Ave from SMH2095L08 to SMH2095U02.</p> <p>Justification: The existing sewer main is over 100 years old and may be a candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe. Modeling analysis of the existing system suggests that the main had a LOS of 5-10 years. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	\$ 2,210,000

ND-7	<p>California St & Broadway to Hewitt Ave & Virginia</p> <p>Description: The proposed project would replace approximately 2000 LF of sewer main with 18-inch - 24-inch pipe to increase conveyance capacity from California Street and Broadway Avenue to Hewitt Avenue and Virginia Ave from SMH2095V14 to SMH2095X14.</p> <p>Justification: The existing main sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal.</p>	\$ 2,140,000
ND-8	<p>Colby Ave, 26th St, Rockefeller, and Wetmore Ave</p> <p>Description: Approximately 2750 LF of sewer main would be replaced with 12-inch - 18-inch pipe to increase conveyance capacity along 26th St, Colby Ave, Wetmore Ave, and Rockefeller Ave. The project includes multiple segments of pipe SMH1995J13, SMH1995R13, SMH1995R15, and SMH1995R18 all draining to SMH1995R14.</p> <p>Justification: The existing sewer mains are over 80 years old and may be candidates for condition replacement. Field evaluation should be conducted to determine the condition of the pipes. Modeling analysis suggests the existing sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	\$ 2,400,000
ND-9	<p>21st St from Rockefeller to Broadway</p> <p>Description: The project would replace approximately 550 LF of sewer main with 18-inch pipe on 21 Street from Rockefeller to Broadway Ave from SMH2095E04 to SMH2095E08.</p> <p>Justification: The existing sewer main is over 100 years old and may be a candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe. Modeling output suggests the existing sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	\$ 540,000
ND-10	<p>Fulton St and Virginia Ave</p> <p>Description: Approximately 6000 LF of 10-inch - 24-inch sewer main would be installed along Virginia Avenue and Fulton Street to Everett Avenue and California Street. Multiple pipe segments are included from SMH2095L11 and SMH2095K03 to SMH2095U19.</p> <p>Justification: The existing sewer mains are over 100 years old and may be candidates for condition replacement. Field evaluation should be conducted to determine the condition of the pipes. Modeling analysis suggests the sewer mains have a LOS of 5-10 years. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	\$ 5,560,000
ND-11	<p>Rainier Ave from Everett Ave to 24th St</p> <p>Description: Replacement would require installation of approximately 1550 LF of 18-inch - 24-inch sewer main along Rainier Avenue from Everett Avenue to 24th Street from SMH2095L07 to SMH2095U10.</p> <p>Justification: The existing sewer main is over 100 years old and may be a candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe. Modeling analysis suggests the existing sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	\$ 1,600,000

ND-12	<p>vic Wetmore Ave from 24th St to 19th St</p> <p>Description: The project would install approximately 4000 LF of 18-inch sewer main near Wetmore Avenue from 19th Street to 24th Street. Multiple segments of sewer main are included from SMH1995J15 to SMH1995J13 and SMH1995A12 to SMH2095M03.</p> <p>Justification: The existing sewer mains are over 100 years old and may be candidates for condition replacement. Field evaluation should be conducted to determine the condition of the pipes. Modeling analysis suggests the existing sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	\$ 3,730,000
ND-13	<p>vic Broadway from 23rd St to 19th St</p> <p>Description: The project would install approximately 1900 LF of 15-inch sewer main between Lombard Avenue and Broadway Avenue from 19th Street to 23rd Street from SMH2095D07 to SMH2095M10.</p> <p>Justification: The existing sewer main is over 100 years old and may be a candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe. Modeling analysis suggests the existing sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	\$ 1,690,000
ND-14	<p>McDougall Ave from 21st St to 24th St</p> <p>Description: The project would install approximately 2550 LF of 12-inch sewer main along McDougall from 21st Street to 24th Street. Multiple segments of sewer main are included from SMH2095F01 and SMH2095F04 to SMH2095L02.</p> <p>Justification: The existing sewer mains are over 100 years old and may be candidates for condition replacement. Field evaluation should be conducted to determine the condition of the pipes. Modeling analysis suggests the existing sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	\$ 2,160,000
ND-15	<p>Pacific Regulator to SRI Improvement</p> <p>Description: This project would replace the existing 30-inch sewer main with a 48-inch pipeline from the Pacific Regulator to SMH2095A08 on the Snohomish River CSO Interceptor. The existing regulator is recommended to be revised by connecting the Summit Avenue Interceptor to the structure and including two overflow weirs to the Snohomish River CSO Interceptor and SRO7.</p> <p>Justification: Modeling analysis suggests that flow in the Summit Ave Interceptor would reverse during peak wet weather events and potentially cause flooding at SMH2995K05. Visual evidence of excessive surcharge was observed during a site visit of this manhole. The reverse flow condition is a result of the Summit Avenue Interceptor exceeding its capacity from flow contributions from the Pacific Regulator, Basin NC, and portions of Basin T-Q.</p> <p>Project ND-15 was identified to increase the flow contribution to the Snohomish River CSO Interceptor. Modeling analysis suggests that flow from the regulator causes surcharging in the Summit Avenue Interceptor that causes the reverse flow condition. By expanding the regulator to connect to the Summit Avenue Interceptor, surcharging can be limited by an overflow weir to the Snohomish River CSO Interceptor.</p> <p>Project NG-6 was also identified to reduce surcharging in the Summit Avenue Interceptor by increasing the capacity between the Pacific Regulator and SMH2995Q13. A study of the Summit Avenue Interceptor, 36th Street Regulator, and Pacific Regulator should be conducted prior to implementing either project ND-15 or NG-6.</p>	\$ 1,110,000
COMMENTS		
Note 1. All costs presented in this basin plan are in 2014 dollars.		

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Basin ND

Sewer Main	24" and over Force Main	10-Year CIP Facility
Regulator	Less than 24" Force Main	Sewer Main CIP beyond 10-Year
Weir	Sewer Basin	Facility
CSO Outfall	Water body	Sewer Main
Active City Sewer Lift Station	Street	
	Highway	
	Everett City Boundary	

1 inch = 859 feet

0 270 540 810 Feet

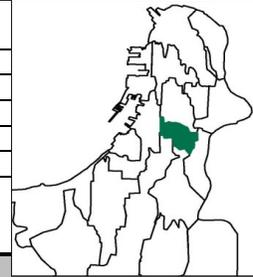
BASIN PLAN
City of Everett

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BASIN NE

BASIN DESCRIPTION

Location	South of combined area, east of Port Gardner; bordered by Hewitt Avenue, Hill Avenue, Colby Avenue, and 35th Street
Area	169 acres
Sensitive Areas	Some slopes greater than 15%
Major Arterials	Hewitt Avenue, Broadway Avenue
Large Users	Snohomish County Government Buildings, Arena
Land Use	Central business district with light industrial and multi-family
Future Development	Expected growth in this area is expected to be mainly commercial and heavy industrial, around Smith Avenue. Residential area is expected to develop to its full land use designation. Re-development in downtown area.



SANITARY SEWER FLOWS

Year 2013 (gpd)	195,601
Year 2036 (gpd)	284,150
Year 2100 (gpd)	461,970
Growth (2036) %	45%
Growth (2100) %	136%
Undeveloped parcels	5.56 acres (42 parcels)
Unsewered Areas	None

EXISTING SYSTEM

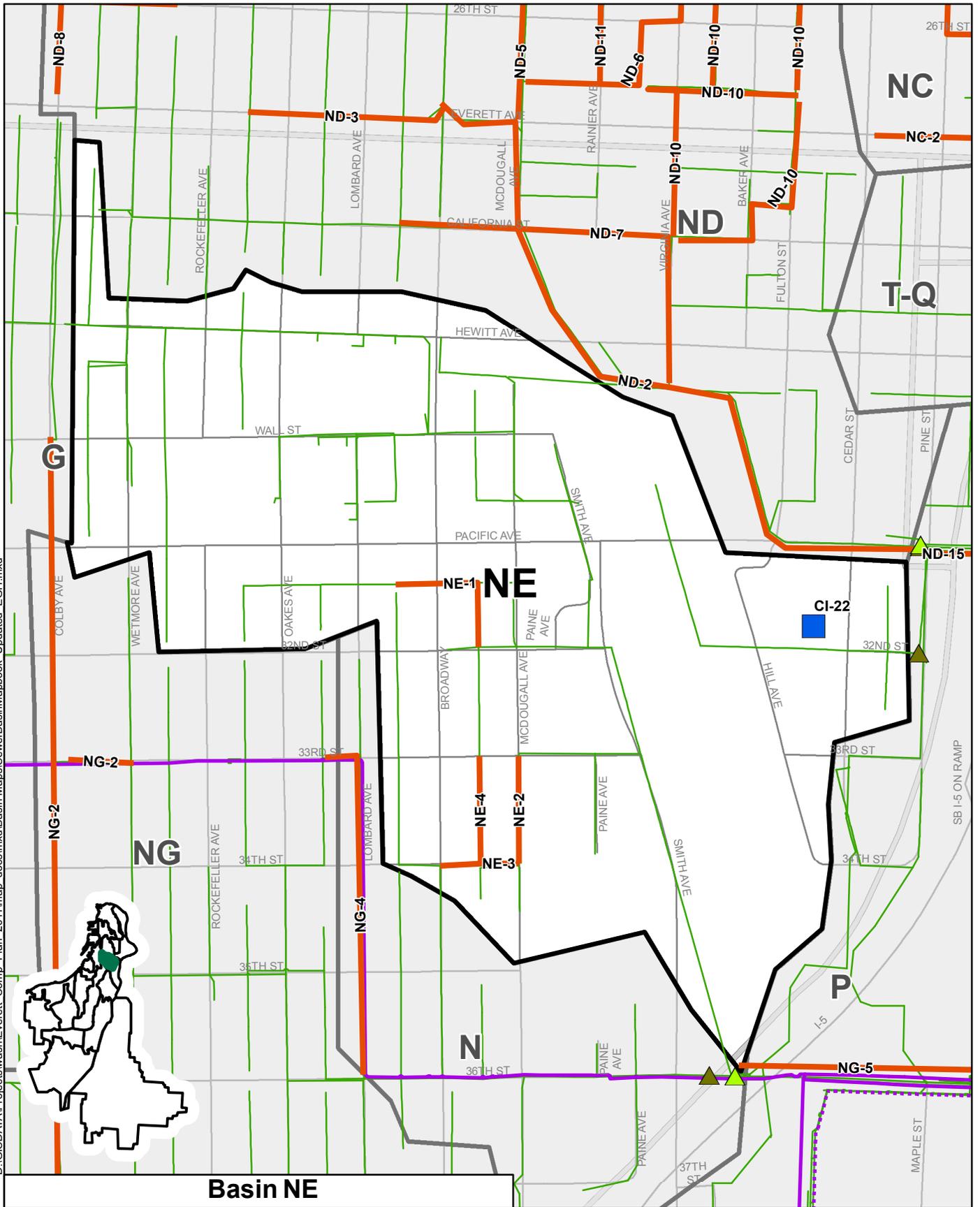
Combined or Sanitary	Combined
Total Length of Pipe	4.7 miles
Upstream Basins	None
Downstream Basins	Basins P and T-Q (Summit Avenue Interceptor)
Flow Meter	None
Receiving Facilities	Memorial Stadium and Summit Avenue Interceptor
Existing Lift Stations	None
Existing Diversion	R64 (controls if the flow from this basin goes to the South End Interceptor or to the Snohomish River CSO interceptor), R61 controls flow to Summit Avenue Interceptor or R64.
CSO/SSO	R60 to R64 to SRO8 or R61 to R11 to SRO7
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	1.64
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	24.5

CIP

CIP ID	Description	Cost
CIP Year 2015-2024		
Service Center Seismic Upgrades		
CI-22	<p>Description Either retrofit service center or buildnew building for Public Works Employees.</p> <p>Justification: Building stability analysis indicates that existing service center buildings are not safe during a large earthquake.</p>	\$ 9,450,000
CIP Year 2024+		
Pacific and Broadway to McDougall and 32nd		
NE-1	<p>Description: The project would replace existing 6- and 8-inch pipeline with a 12-inch parallel to 32nd Street up to SMH2995D21, then parallel to McDougall Avenue, approximately 655 feet from manhole SMH2995D16 downstream to SMH2995E12.</p> <p>Justification: The existing sewer main is 80-100 years old and may be a candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe.</p>	\$ 370,000
McDougall from 33rd to 34th		
NE-2	<p>Description: The project would replace approximately 479 ft. of the existing 12-inch pipeline with a 15-inch along McDougall Avenue from manhole SMH2995F02 downstream to SMH2995L02.</p> <p>Justification: The existing pipeline is 80-100 years old and is a candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe.</p>	\$ 270,000

NE-3	<p>34th from McDougall to Broadway</p> <p>Description: This project would install approximately 170 ft. of the existing pipeline to 12-inch pipe along 34th Street from SMH2995M18 to SMH2995L02.</p> <p>Justification: Improvement NE-2 would increase the upstream diameter, and this project would install a 12-inch sewer main to match the upstream improvement.</p>	\$ 100,000
NE-4	<p>33rd to 34th between Broadway and McDougall</p> <p>Description: The project would replace the existing 12-inch pipeline along 34th Street and along Broadway Avenue from manhole SMH2995M18 downstream to SMH2995E13 (Approx. 659 ft).</p> <p>Justification: The existing pipeline is 80-100 years old and is a candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe.</p>	\$ 350,000
COMMENTS		
Note 1. All costs presented in this basin plan are in 2014 dollars.		

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Basin NE

Sewer Main	24" and over Force Main	10-Year CIP Facility
Regulator	Less than 24" Force Main	Sewer Main CIP beyond 10-Year
Weir	Sewer Basin	Facility
CSO Outfall	Water body	Sewer Main
Active City Sewer Lift Station	Street	
	Highway	
	Everett City Boundary	

1 inch = 599 feet

0 180 360 540 Feet

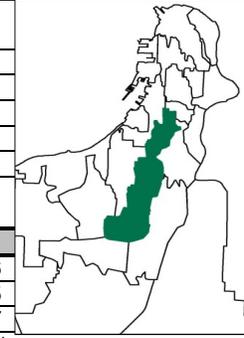
BASIN PLAN
City of Everett

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BASIN NG

BASIN DESCRIPTION

Location	North of sanitary area, west of Glacier View; bordered by 36th Street, Delaware Avenue, Upper Ridge Road, and Berkshire Drive
Area	1,374 acres
Sensitive Areas	Wetlands; some slopes greater than 15%
Major Arterials	Evergreen Way, 52nd Street SE
Large Users	Providence Hospital, Everett Community College
Land Use	Single family, mixed-use commercial. Commercial area along Evergreen Way.
Future Development	The expected growth in this area is mainly commercial. Residential areas are expected to develop to their full land use designation.



SANITARY SEWER FLOWS

Year 2013 (gpd)	955,756
Year 2036 (gpd)	1,273,065
Year 2100 (gpd)	1,998,327
Growth (2036) %	33%
Growth (2100) %	109%
Undeveloped parcels	76.25 acres (189 parcels)
Unsewered Areas	20 acres (62 parcels)

EXISTING SYSTEM

Combined or Sanitary	Combined north of 58th Street, Separated South of 58th Street
Total Length of Pipe	38.5 miles
Upstream Basins	None
Downstream Basins	Basins P and T-Q (Summit Avenue Interceptor)
Flow Meter	SFE 11 (1/09 - 5/09), SFE 17 (6/09 - 8/09), SFE 35 and 36 (12/13 - 11/14)
Receiving Facilities	Grand Avenue and 36th Street Trunks to Summit Avenue Interceptor
Existing Lift Stations	LS 12 (not included in the model)
Existing Diversion	R61 to Summit Avenue Interceptor
CSO/SSO	R60 to R64 to SRO8 or R61 to R11 to SRO7
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	5.94
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	41.5

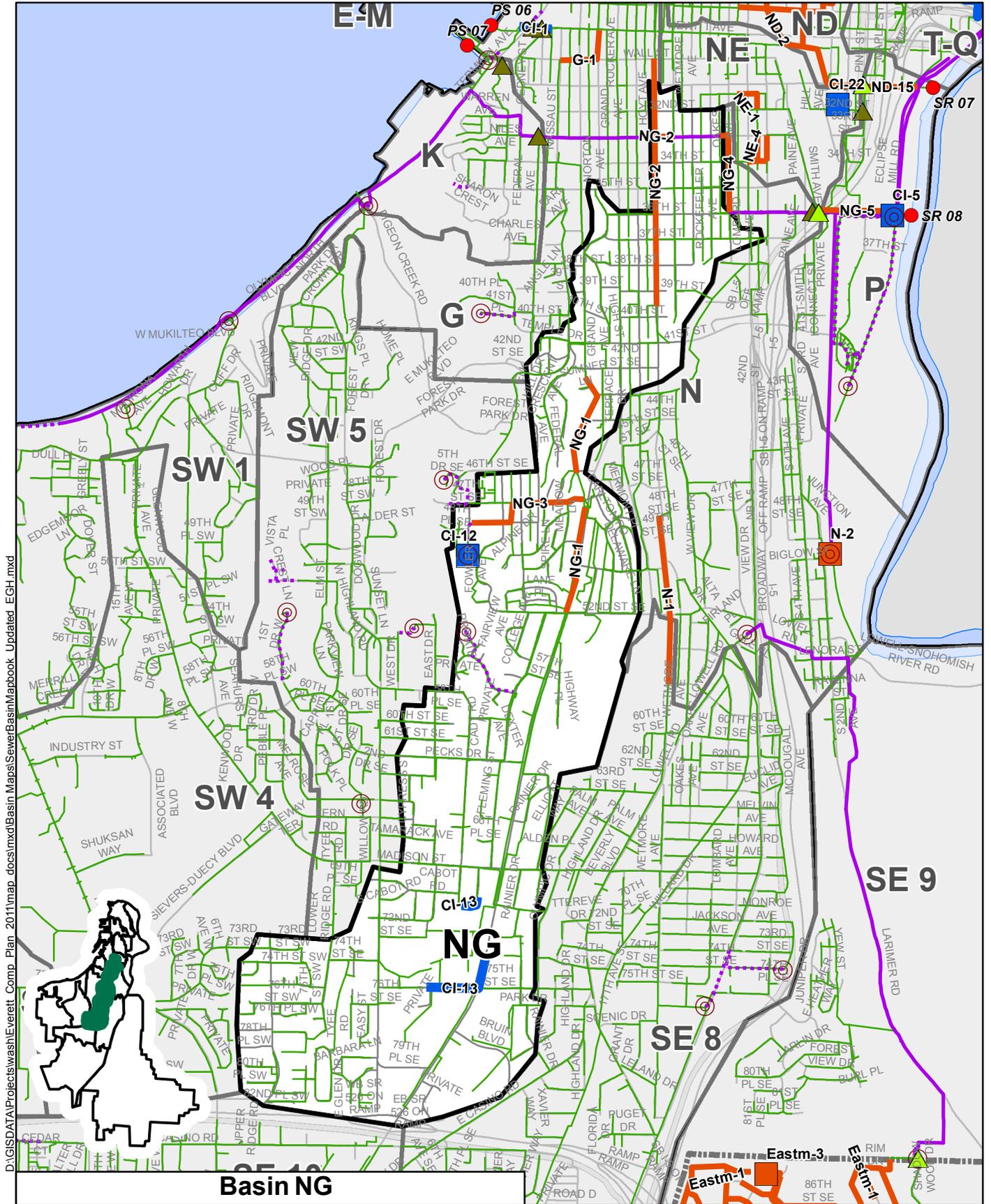
CIP

CIP ID	Description	Cost
CIP Year 2015-2024		
CI-12	<p>Lift Station #12</p> <p>Description: Replace sewer Lift Station #12. This is a small capacity station.</p> <p>Justification: Recent lift station operation and maintenance assessment (Table 5-2 of 2013 CSP) identified problems with the vacuum prime system and lack of backup power supply. A previous condition assessment confirmed the need to replace this facility due to a history of mechanical failures and structural deterioration. The wet well is too small and the existing facility has reached the end of its service life.</p>	\$ 2,000,000
CI-13	<p>Beverly Lake Sewer Replacement</p> <p>Description: Approximately 800 to 1000 LF of collection sewer has a variety of problems including; high maintenance for grease cleaning, sags, deteriorated pipe walls, infiltration, sewer spills, backups in side sewers, poor access etc. This project would replace segments of the sewer collection system to remedy the pipe defects and facilitate better access and maintenance. Various alternatives are possible.</p> <p>The project will begin with a pre-design study in 2014 to identify and evaluate the feasible options which might include private grinder pumps, a new City sewer lift station or gravity conveyance. Costs listed below are likely to change upon completion of the pre-design study.</p> <p>Justification: S&D cleaning and repair effort has escalated significantly in recent years. This project has some urgency due to the potential for sewer backups or spills. During 2014, S&D replaced approximately 185 LF of pipe in the vicinity of 701 75th St SE.</p>	\$ 930,000
CIP Year 2024+		

<p>NG-1</p>	<p>Grand Ave from 52nd St to 42nd St</p> <p>Description: The project would replace approximately 3950 LF of sewer main with 24-inch - 42-inch pipe along Grand Avenue from 52nd Street to 42nd St. The 24-inch sewer main would be installed from SMH3195B15 to SMH3195Q20. The 42-inch sewer main would be installed from SMH3195K14 to SMH3195G15.</p> <p>Justification: Modeling analysis suggests the existing sewer main has less than 5 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal.</p>	<p>\$ 5,180,000</p>
<p>NG-2</p>	<p>Colby Ave from 40th St to Wall St</p> <p>Description: The project would replace approximately 5350 LF of sewer main with 12-inch - 18-inch pipe along Colby Avenue from 40th Street to Wall Street from SMH3095Z12 and SMH3095A23 to SMH3095H13.</p> <p>Justification: The existing sewer main is over 100 years old making it a candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe. Modeling analysis suggests the existing sewer main has a 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	<p>\$ 4,530,000</p>
<p>NG-3</p>	<p>48th and 49th St from Black Forest Lane to Evergreen Way</p> <p>Description: The project would replace approximately 2500 LF of sewer main with 12-inch pipe along 48th Street and 49th Street from Black Forest Lane to Evergreen Way from SMH3195U02 to SMH3195Q21.</p> <p>Justification: Modeling analysis suggests the existing sewer main has less than 5 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal.</p>	<p>\$ 2,380,000</p>
<p>NG-4</p>	<p>Lombard Ave from 33rd to 36th St</p> <p>Description: The project would replace approximately 1600 LF of sewer main with 24-inch pipe along Lombard Avenue from 33rd Street to 36th Street from SMH2995E06 to SMH2995N13.</p> <p>Justification: The existing pipeline is 80-100 years old and is a candidate for condition replacement. Field evaluation should be conducted to determine the condition of the pipe. Modeling analysis suggests the existing pipe has less than 5 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. Without confirmation the LOS is less than City goal, the project may be implemented as a condition replacement.</p>	<p>\$ 1,970,000</p>

<p>NG-5</p>	<p>36th St Regulator to SRO8 Improvement</p> <p>Description: The project would consist of the installation of a parallel 60-inch pipe from the 36th Street Regulator to SMH2995Q13, which contains a control valve to SRO8. The 36th Street Regulator would be modified to accommodate the additional pipe and include a longer weir to reduce surcharging at high flows.</p> <p>Justification: Modeling analysis suggests that flow in the Summit Ave Interceptor would reverse during peak wet weather events and potentially cause flooding at SMH2995K05. Visual evidence of excessive surcharge was observed during a site visit of this manhole. The reverse flow condition is a result of the Summit Avenue Interceptor exceeding its capacity from flow contributions from the Pacific Regulator, Basin NC, and portions of Basin T-Q.</p> <p>When the Summit Avenue Interceptor flows in reverse, it discharges to the 36th Street Regulator. The flow from the 42-inch interceptor combines with flow from a 36-inch trunk sewer from Basin NE and flow from a 48-inch trunk sewer from Basins N and NG. The existing 54-inch between the 36th Street Regulator and SMH2995Q13 is a bottleneck during these conditions and would reach its capacity and cause surcharging in the regulator and Summit Avenue Interceptor.</p> <p>Project ND-15 was also identified to reduce surcharging in the Summit Avenue Interceptor by increasing the flow contribution to the Snohomish River CSO Interceptor. A study of the Summit Avenue Interceptor, 36th Street Regulator, and Pacific Regulator should be conducted prior to implementing either project ND-15 or NG-6.</p>	<p>\$ 1,520,000</p>
COMMENTS		
<p>Note 1. All costs presented in this basin plan are in 2014 dollars.</p>		

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Basin NG

- | | | |
|--------------------------------|--------------------------|-------------------------------|
| Sewer Main | 24" and over Force Main | 10-Year CIP Facility |
| Regulator | Less than 24" Force Main | Sewer Main CIP beyond 10-Year |
| Weir | Sewer Basin | Facility |
| CSO Outfall | Water body | Sewer Main |
| Active City Sewer Lift Station | Street | |
| | Highway | |
| | Everett City Boundary | |


 1 inch = 2,489 feet

 0 790 1,580 2,370 Feet

BASIN PLAN City of Everett

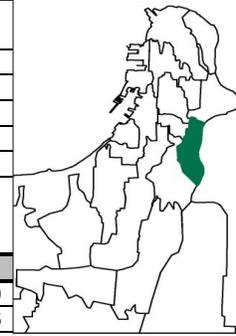


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BASIN P

BASIN DESCRIPTION

Location	North of sanitary area, east of Port Gardner; bordered by Pacific Avenue, Snohomish River, I-5, and Cascade View Street
Area	350 acres
Sensitive Areas	Wetlands; some slopes greater than 15%; Snohomish River
Major Arterials	I-5
Large Users	
Land Use	Light industrial, waterfront commercial, and conservancy protection
Future Development	Mainly light industrial, and waterfront commercial. Residential areas are expected to develop to their full land use designation. Polygom Riverfront Development.



SANITARY SEWER FLOWS

Year 2013 (gpd)	88,580
Year 2036 (gpd)	127,426
Year 2100 (gpd)	203,879
Growth (2036) %	44%
Growth (2100) %	130%
Undeveloped parcels	157.09 acres (73 parcels)
Unsewered Areas	2 acres (7 parcels)

EXISTING SYSTEM

Combined or Sanitary	Combined (except new development)
Total Length of Pipe	11.1 miles
Upstream Basins	None
Downstream Basins	None
Flow Meter	None
Receiving Facilities	LS33, South End Interceptor, Snohomish River CSO Interceptor
Existing Lift Stations	3 small lift stations not included in the model, LSS (New LS43 and 44 at Riverfront Development)
Existing Diversion	None
CSO/SSO	LS33 to SRO8
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	0.78
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	undefined

CIP

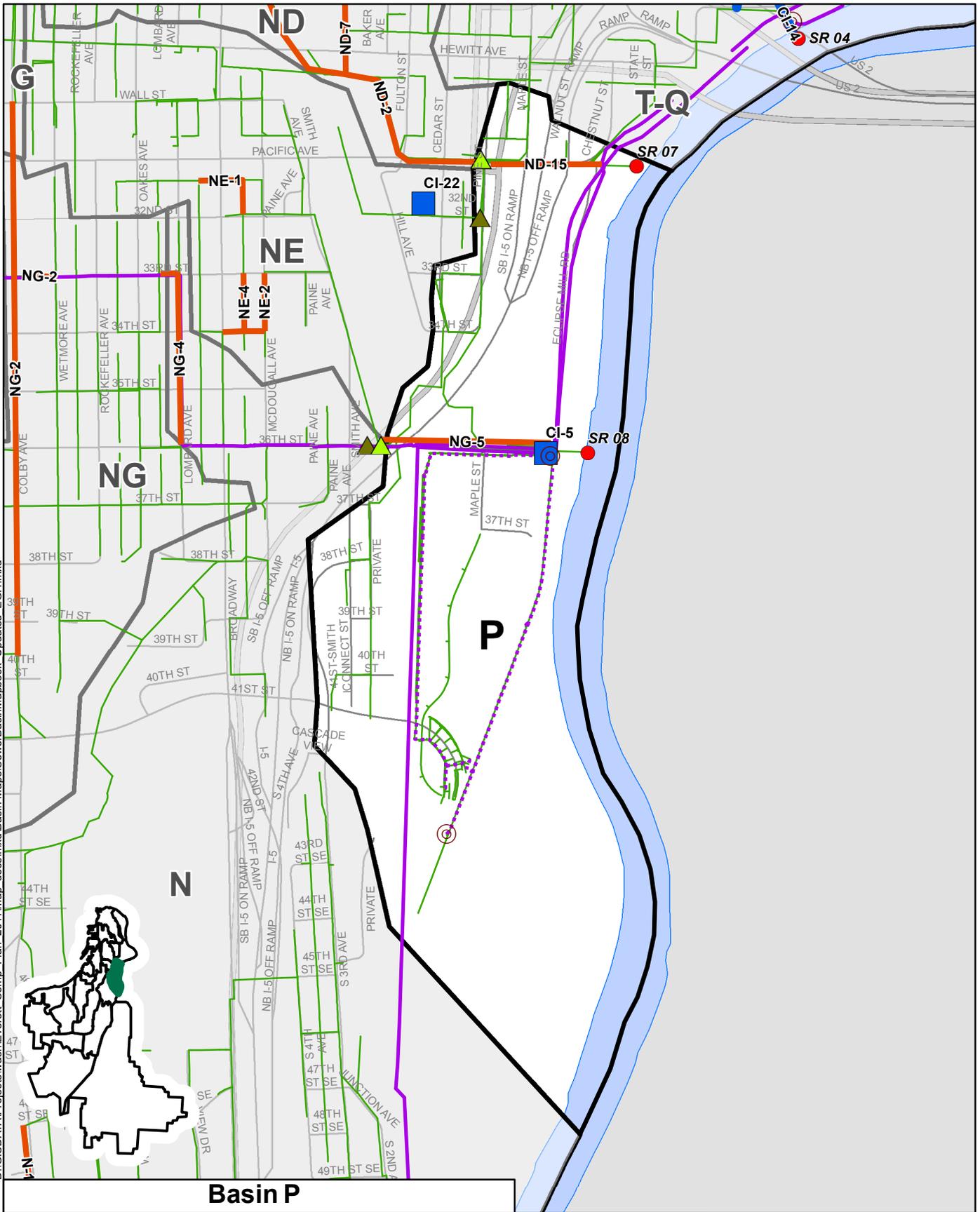
CIP ID	Description	Cost
	CIP Year 2015-2024	
	Riverfront LS 33 / Central Area LS	
	Description: New sanitary lift station on former landfill site to serve pending mixed-use development. Upgrade of existing LS 33 to handle additional flows from north end of Riverfront Development.	
	Justification: City commitment in the Property Disposition Agreement (PDA) for Riverfront Development	
CI-5		\$ 6,200,000
	CIP Year 2024+	

COMMENTS

Note 1. All costs presented in this basin plan are in 2014 dollars.

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Basin P

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|--------------------------------|--------------------------|-------------------------------|
| Sewer Main | 24" and over Force Main | 10-Year CIP Facility |
| Regulator | Less than 24" Force Main | Sewer Main CIP beyond 10-Year |
| Weir | Sewer Basin | Facility |
| CSO Outfall | Water body | Sewer Main |
| Active City Sewer Lift Station | Street | |
| | Highway | |
| | Everett City Boundary | |

1 inch = 1,118 feet

0 350 700 1,050 Feet

BASIN PLAN

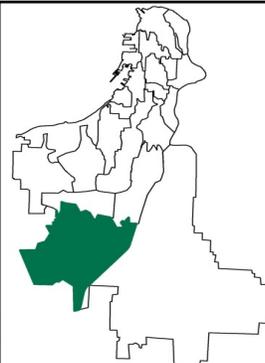
City of Everett

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BASIN SE_7

BASIN DESCRIPTION

Location	South of City of Everett, Silver Lake Area; bordered by 100th Street SW, Everett Mall Way, Everett City Limits
Area	3,991 acres
Sensitive Areas	Significant wetlands; some slopes greater than 15%; Penny Creek, Park Place, and North Creek
Major Arterials	I-5, SR 99, 112th, Everett Mall Way, Evergreen Way, Airport Rd, 128th St SW.
Large Users	McCollum Park & Pool, Mariner High School. Large contribution to the system at connection with adjacent districts: Alderwood, Mukilteo and Silver Lake
Land Use	Multi-family and mixed use with light industrial and single family.
Future Development	The main growth expected is from adjacent districts contributing to the system upstream of this basin (Alderwood, Mukilteo, and Silver Lake) however, sewage discharged to Everett's system is limited by each agency's contract agreement.



SANITARY SEWER FLOWS

Year 2013 (gpd)	1,350,723
Year 2036 (gpd)	1,900,571
Year 2100 (gpd)	2,960,749
Growth (2036) %	41%
Growth (2100) %	119%
Undeveloped parcels	17.64 acres (957 parcels)
Unsewered Areas	28 acres (71 parcels)

EXISTING SYSTEM

Combined or Sanitary	Separated Sanitary
Total Length of Pipe	30.7 miles
Upstream Basins	None
Downstream Basins	SE 8
Flow Meter	SFE 01 (1/09 - 12/12)
Receiving Facilities	Central Interceptor to South End Interceptor
Existing Lift Stations	LS 24, LS MN, and LS MS. Also, there are 7 small local lift stations not included in model.
Existing Diversion	None
CSO/SSO	None
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	8.52
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	13.7

CIP

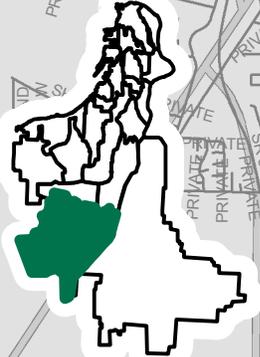
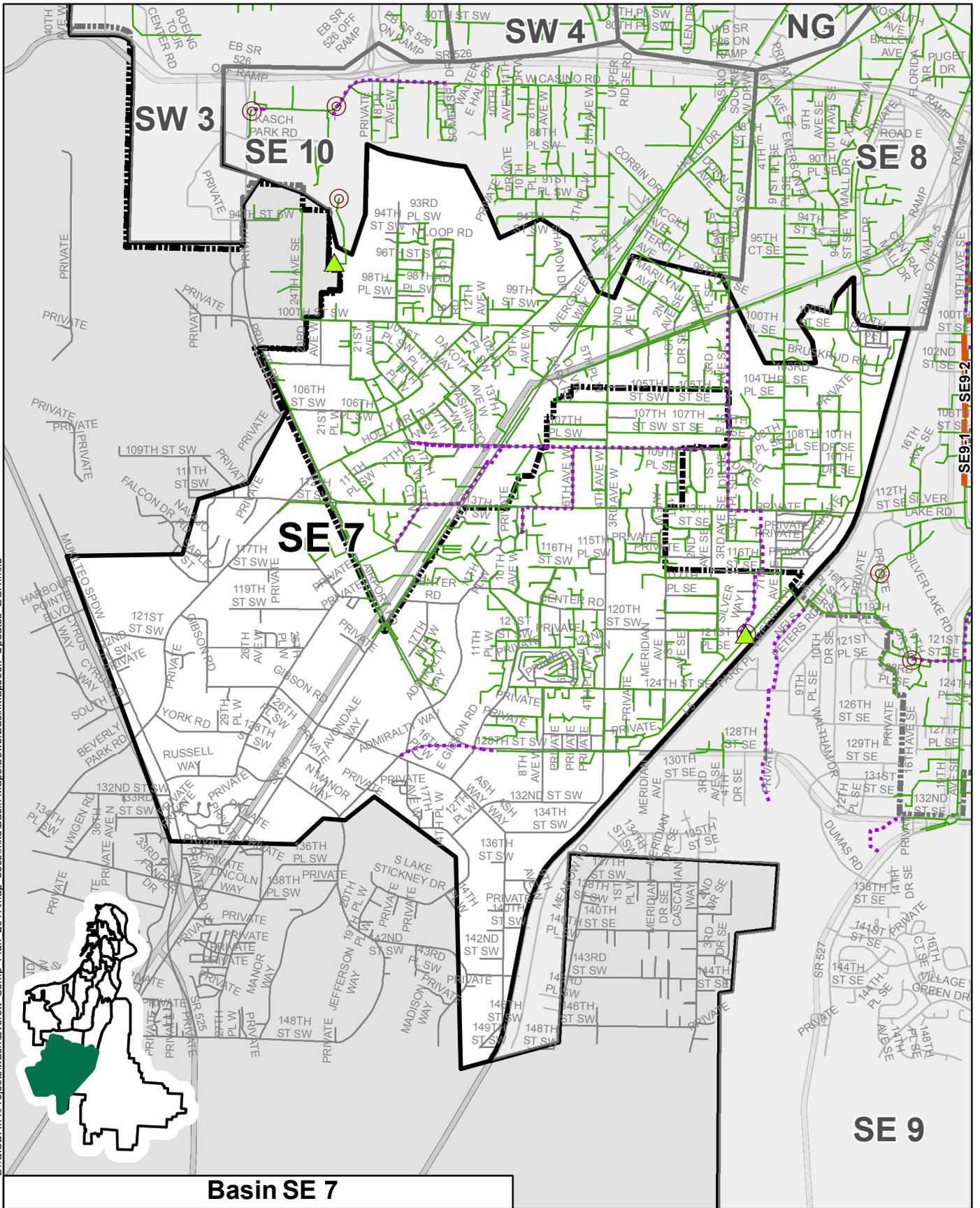
CIP ID	Description	Cost
	<i>CIP Year 2015-2024</i>	
	<i>CIP Year 2024+</i>	

COMMENTS

Note 1. All costs presented in this basin plan are in 2014 dollars.

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Basin SE 7

- | | | |
|--------------------------------|--------------------------|-------------------------------|
| Sewer Main | 24" and over Force Main | 10-Year CIP Facility |
| Regulator | Less than 24" Force Main | Sewer Main CIP beyond 10-Year |
| Weir | Sewer Basin | Facility |
| CSO Outfall | Water body | Sewer Main |
| Active City Sewer Lift Station | Street | |
| | Highway | |
| | Everett City Boundary | |



1 inch = 2,928 feet



BASIN PLAN City of Everett



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BASIN SE_8

BASIN DESCRIPTION

Location	Northeast of sanitary area, northeast of Pinehurst; bordered by 52nd Street, I-5, 3rd Avenue, and Everett Mall Way.
Area	1,485 acres
Sensitive Areas	Wetlands; some slopes greater than 15%
Major Arterials	I-5, SR 526, Everett Mall Way, Broadway
Large Users	Everett Mall and Cascade High School
Land Use	Mostly single and multi-family dwellings with cemeteries
Future Development	The main expected growth in this area is mixed, commercial and multifamily. Residential area is expected to develop to its full land use designation.



SANITARY SEWER FLOWS

Year 2013 (gpd)	922,109
Year 2036 (gpd)	1,240,865
Year 2100 (gpd)	1,935,303
Growth (2036) %	35%
Growth (2100) %	110%
Undeveloped parcels	131.79 acres (161 parcels)
Unsewered Areas	None

EXISTING SYSTEM

Combined or Sanitary	Separated Sanitary
Total Length of Pipe	34.3 miles
Upstream Basins	SE 7, SE 10
Downstream Basins	None
Flow Meter	SFE 04 (1/09 - 4/10), SFE 23 (5/10 - 4/11)
Receiving Facilities	Central Interceptor to South End Interceptor
Existing Lift Stations	LS 18, LS 19
Existing Diversion	R101, SMH0985D16 (To SEI or Memorial Stadium Interceptor)
CSO/SSO	None
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	18.91
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	26.1

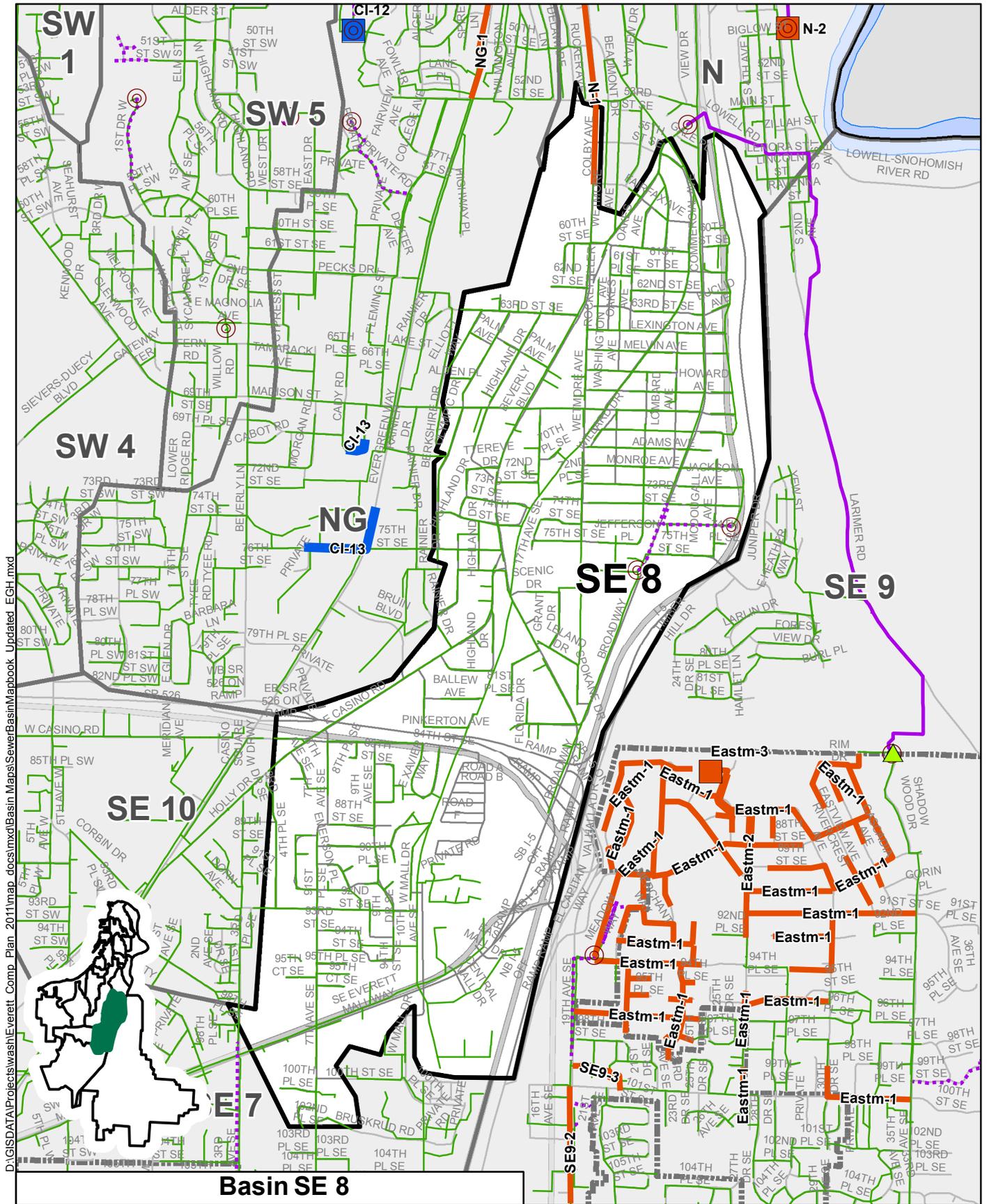
CIP

CIP ID	Description	Cost
	<i>CIP Year 2015-2024</i>	
	<i>CIP Year 2024+</i>	

COMMENTS

Note 1. All costs presented in this basin plan are in 2014 dollars.

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Basin SE 8

- | | | |
|--------------------------------|--------------------------|-------------------------------|
| Sewer Main | 24" and over Force Main | 10-Year CIP Facility |
| Regulator | Less than 24" Force Main | Sewer Main CIP beyond 10-Year |
| Weir | Sewer Basin | Facility |
| CSO Outfall | Water body | Sewer Main |
| Active City Sewer Lift Station | Street | |
| | Highway | |
| | Everett City Boundary | |

1 inch = 2,075 feet
 0 650 1,300 1,950
 Feet

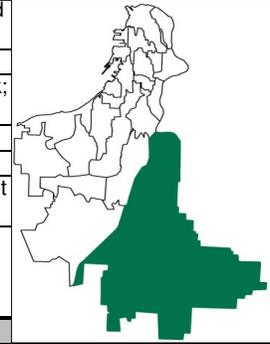
BASIN PLAN
City of Everett

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BASIN SE_9

BASIN DESCRIPTION

Location	Southeast of sanitary area, Silver Lake area; bordered by Snohomish River, I-5, and SR 526
Area	13,227 acres
Sensitive Areas	Some wetlands; significant slopes greater than 15%; Wood Creek and Thomas Creek; Snohomish River
Major Arterials	I-5, 35th Avenue SE, 112th Street SE, 19th Avenue SE
Large Users	Silver Lake
Land Use	Mainly residential (single detached). Commercial area along south I-5 and 112th Street SE, 19th Avenue SE.
Future Development	In the City of Everett area, the residential parcels are expected to develop to their full land use designation. The major growth in this basin is from the adjacent district contribution (Silver Lake).



SANITARY SEWER FLOWS

Year 2013 (gpd)	678,766
Year 2036 (gpd)	933,154
Year 2100 (gpd)	1,485,948
Growth (2036) %	37%
Growth (2100) %	119%
Undeveloped parcels	1408.40 acres (505 parcels)
Unsewered Areas	119 acres (71 parcels)

EXISTING SYSTEM

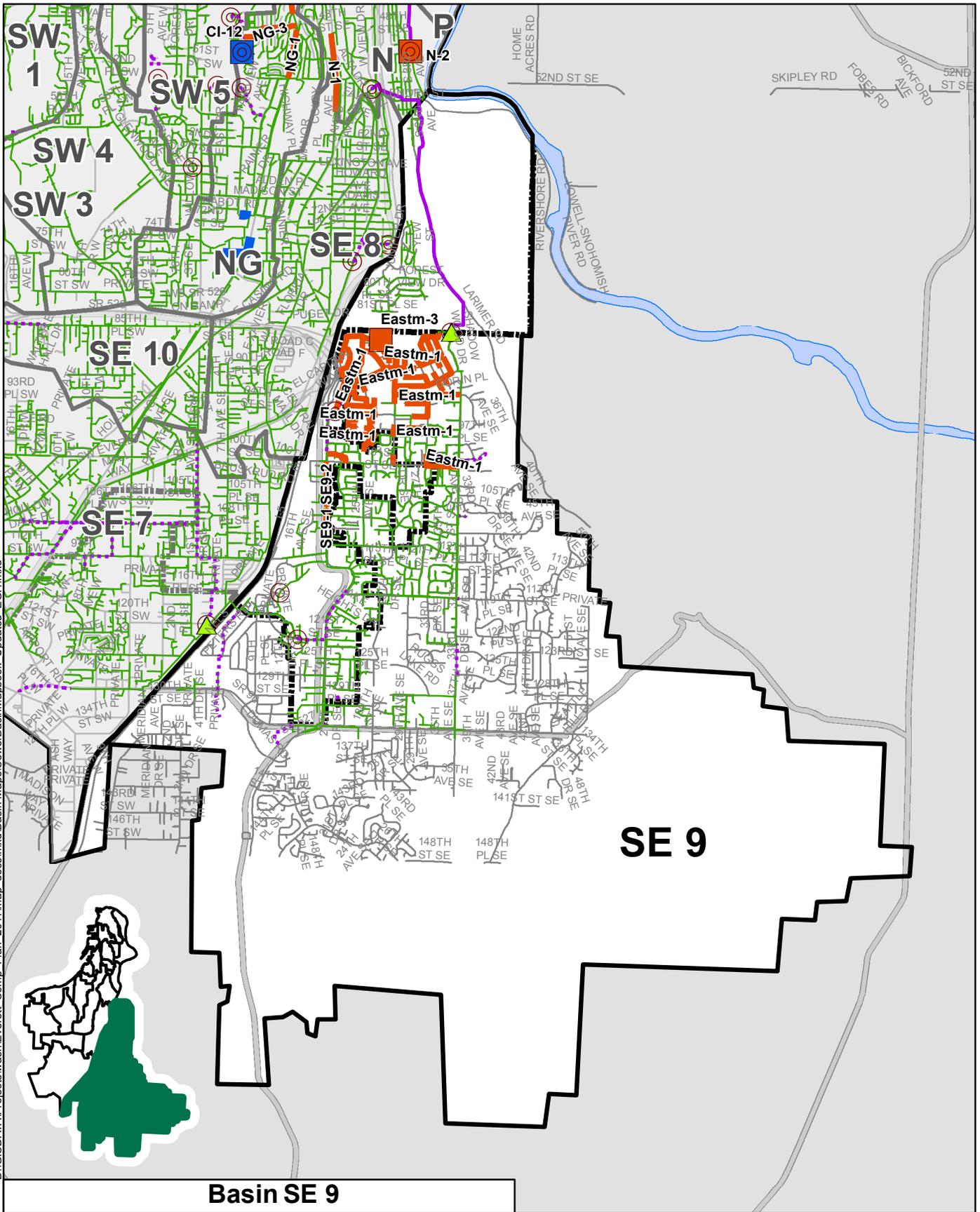
Combined or Sanitary	Separated Sanitary
Total Length of Pipe	21.7 miles
Upstream Basins	None
Downstream Basins	None
Flow Meter	SFE 02 (1/09 - 12/12), SFE 03 (1/09 - 12/12)
Receiving Facilities	South End Interceptor
Existing Lift Stations	LS 25, 36
Existing Diversion	None
CSO/SSO	None
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	4.61
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	33.1

CIP

CIP ID	Description	Cost
	CIP Year 2015-2024	
	CIP Year 2024+	
SE9-1	19th Ave SE Description: This project would replace the existing 10-inch pipeline with a 15-inch along 19th Avenue SE from manhole SMH1985R02 downstream to SMH1985J04 (Approx. 693 feet). Justification: An increase in capacity will be necessary with the addition of new services in the Eastmont planned development in Basin SE-9.	\$ 380,000
SE9-2	19th Ave SE Description: The project would replace the existing 10-inch pipeline with a 12-inch along 19th Avenue SE, from manhole SMH1985A02 downstream to SMH1985R02 (Approx. 2,149 feet). Justification: An increase in capacity will be necessary with the addition of new services in the Eastmont planned development in Basin SE-9.	\$ 1,110,000
SE9-3	100th St SE Description: Replace existing 8-inch pipeline with a 10-inch parallel to 100th Street SE, from manhole SMH1785X16 downstream to NID8099 (Approx. 1,089 feet). Justification: Service expansion in Basin SE-9 would require the replacement of the existing 8-inch sewer main.	\$ 580,000

Eastm-1	<p>Eastmont Gravity Sewer</p> <p>Description: The project would install approximately 44,800 LF of 8-inch gravity pipelines serving 452 acres in the Eastmont new service area.</p> <p>Justification: Development of a new service area.</p>	\$ 18,960,000
Eastm-2	<p>Eastmont Forcemain</p> <p>Description: The project would install approximately 2,500 LF of 6-inch force main from a proposed lift station to serve the Eastmont new service area.</p> <p>Justification: Development of a new service area.</p>	\$ 1,070,000
Eastm-3	<p>Eastmont Lift Station</p> <p>Description: A new Lift Station located north of Gold Way, connecting the east area of Eastmont to the South End Interceptor, would be constructed to have a firm capacity of 350gpm.</p> <p>Justification: Development of a new service area.</p>	\$ 1,090,000
COMMENTS		

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Basin SE 9

- | | | |
|--------------------------------|--------------------------|-------------------------------|
| Sewer Main | 24" and over Force Main | 10-Year CIP Facility |
| Regulator | Less than 24" Force Main | Sewer Main CIP beyond 10-Year |
| Weir | Sewer Basin | Facility |
| CSO Outfall | Water body | Sewer Main |
| Active City Sewer Lift Station | Street | |
| | Highway | |
| | Everett City Boundary | |



1 inch = 5,385 feet



BASIN PLAN City of Everett

HDR

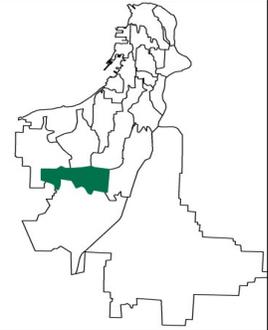


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BASIN SE_10

BASIN DESCRIPTION

Location	Walter E Hall Boeing Area; bordered by 3rd Avenue, SR526 @ Casino Road, Airport Road, and 93rd Street.
Area	933 acres
Sensitive Areas	Significant wetlands
Major Arterials	Casino Road, Evergreen Way. SR526
Large Users	Walter E. Hall Memorial Golf Course and Park, Boeing (South of SR526)
Land Use	Mostly single and multi-family dwellings with some mixed use, commercial, industrial.
Future Development	Mainly growth expected is industrial and commercial. Residential areas are expected to develop to their full land use designation.



SANITARY SEWER FLOWS

Year 2013 (gpd)	774,672
Year 2036 (gpd)	1,083,404
Year 2100 (gpd)	1,661,679
Growth (2036) %	40%
Growth (2100) %	115%
Undeveloped parcels	42.59 acres (55 parcels)
Unsewered Areas	None

EXISTING SYSTEM

Combined or Sanitary	Separated Sanitary
Total Length of Pipe	11.6 miles
Upstream Basins	None
Downstream Basins	SE_8
Flow Meter	None
Receiving Facilities	Central Interceptor to South End Interceptor
Existing Lift Stations	LS 28, LS 29, LS 30
Existing Diversion	None
CSO/SSO	None
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	5.07
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	10.0

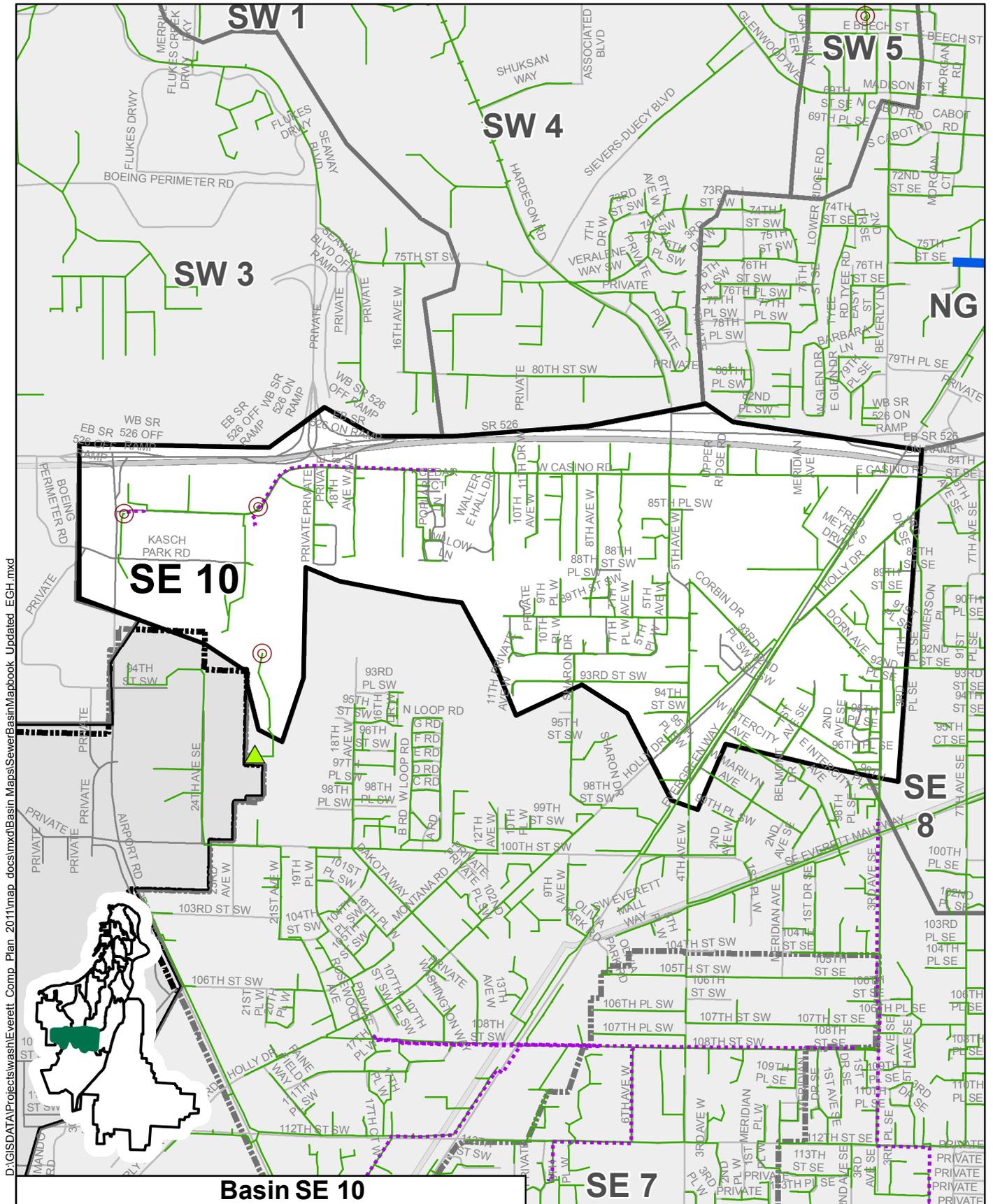
CIP

CIP ID	Description	Cost
	<i>CIP Year 2015-2024</i>	
	<i>CIP Year 2024+</i>	

COMMENTS

Note 1. All costs presented in this basin plan are in 2014 dollars.

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Basin SE 10

- | | | |
|--------------------------------|--------------------------|-------------------------------|
| Sewer Main | 24" and over Force Main | 10-Year CIP Facility |
| Regulator | Less than 24" Force Main | Sewer Main CIP beyond 10-Year |
| Weir | Sewer Basin | Facility |
| CSO Outfall | Water body | Sewer Main |
| Active City Sewer Lift Station | Street | |
| | Highway | |
| | Everett City Boundary | |



1 inch = 1,852 feet
 0 580 1,160 1,740 Feet

BASIN PLAN
 City of Everett



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BASIN SW_1

BASIN DESCRIPTION

Location	North SE basins, west of Basin NG; bordered by Pigeon Creek Road, Baker Drive, and Puget Sound
Area	1,226 acres
Sensitive Areas	Many wetlands; significant slopes greater than 15%; Merrill Ring Creek and Powder Mill Gulch; Puget Sound
Major Arterials	West Mukilteo Blvd
Large Users	
Land Use	Mostly single family with some office and industrial parks (Merrill Creek Parkway)
Future Development	Undeveloped parcels are mainly residential, south of 23rd Drive. Residential areas are expected to develop to their full land use designation.



SANITARY SEWER FLOWS

Year 2013 (gpd)	431,686
Year 2036 (gpd)	549,520
Year 2100 (gpd)	829,434
Growth (2036) %	27%
Growth (2100) %	92%
Undeveloped parcels	148.54 acres (162 parcels)
Unsewered Areas	None

EXISTING SYSTEM

Combined or Sanitary	Separated Sanitary
Total Length of Pipe	22.9 miles
Upstream Basins	None
Downstream Basins	None
Flow Meter	SFE 08 (1/09 - 5/09)
Receiving Facilities	Mukilteo Beach Interceptor to LS1 to SW Interceptor to SEI
Existing Lift Stations	None
Existing Diversion	None
CSO/SSO	SSO LS 01
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	9.27
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	11.8

CIP

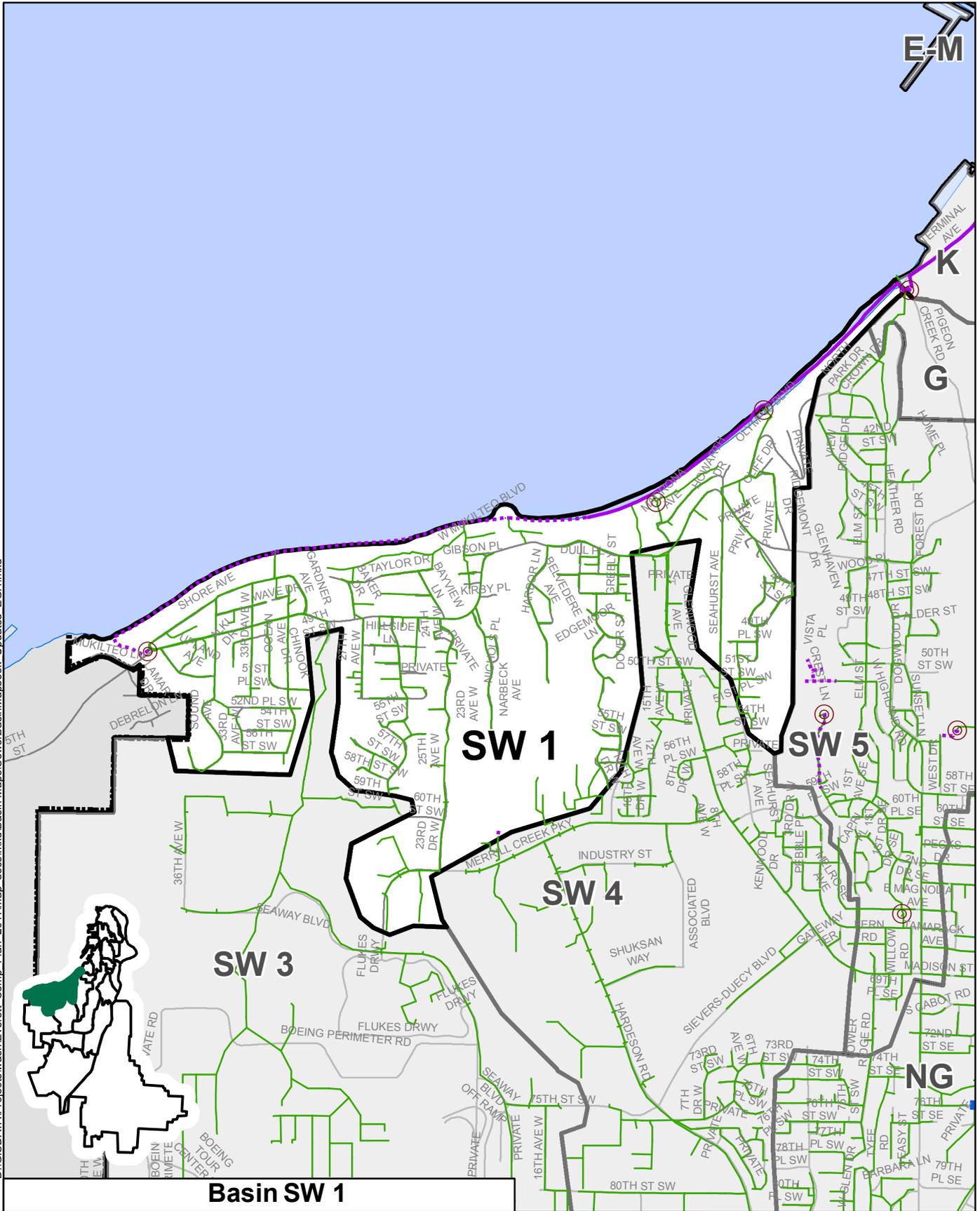
CIP ID	Description	Cost
	<i>CIP Year 2015-2024</i>	
	<i>CIP Year 2024+</i>	

COMMENTS

Note 1. All costs presented in this basin plan are in 2014 dollars.

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Basin SW 1

Sewer Main	24" and over Force Main	10-Year CIP Facility
Regulator	Less than 24" Force Main	Sewer Main CIP beyond 10-Year
Weir	Sewer Basin	Facility
CSO Outfall	Water body	Sewer Main
Active City Sewer Lift Station	Street	
	Highway	
	Everett City Boundary	

1 inch = 2,401 feet

0 760 1,520 2,280 Feet

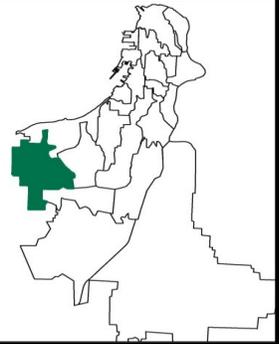
BASIN PLAN
City of Everett

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BASIN SW_3

BASIN DESCRIPTION

Location	West of Basin SW4; bordered by SR 526, Seaway Blvd, City of Mukilteo, and 59th Street SW.
Area	1,670 acres
Sensitive Areas	Significant wetlands; Significant slopes greater than 15%; Powder Mill Gulch
Major Arterials	36th Avenue West, Seaway Boulevard
Large Users	Boeing Plant
Land Use	Almost entirely office/industrial and heavy industry
Future Development	The expected growth is industrial (heavy and office/industrial park). Future flows were estimated assuming development to full land use designation, using current industrial dryweather patterns.



SANITARY SEWER FLOWS

Year 2013 (gpd)	652,015
Year 2036 (gpd)	803,359
Year 2100 (gpd)	1,176,291
Growth (2036) %	23%
Growth (2100) %	80%
Undeveloped parcels	308.78 acres (50 parcels)
Unsewered Areas	None

EXISTING SYSTEM

Combined or Sanitary	Separated Sanitary
Total Length of Pipe	4.4 miles
Upstream Basins	None
Downstream Basins	None
Flow Meter	SFE 20 (8/09 - 9/10)
Receiving Facilities	Mukilteo Beach Interceptor to LS1 to SW Interceptor to SEI
Existing Lift Stations	None
Existing Diversion	None
CSO/SSO	SSO LS1
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	3.49
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	9.1

CIP

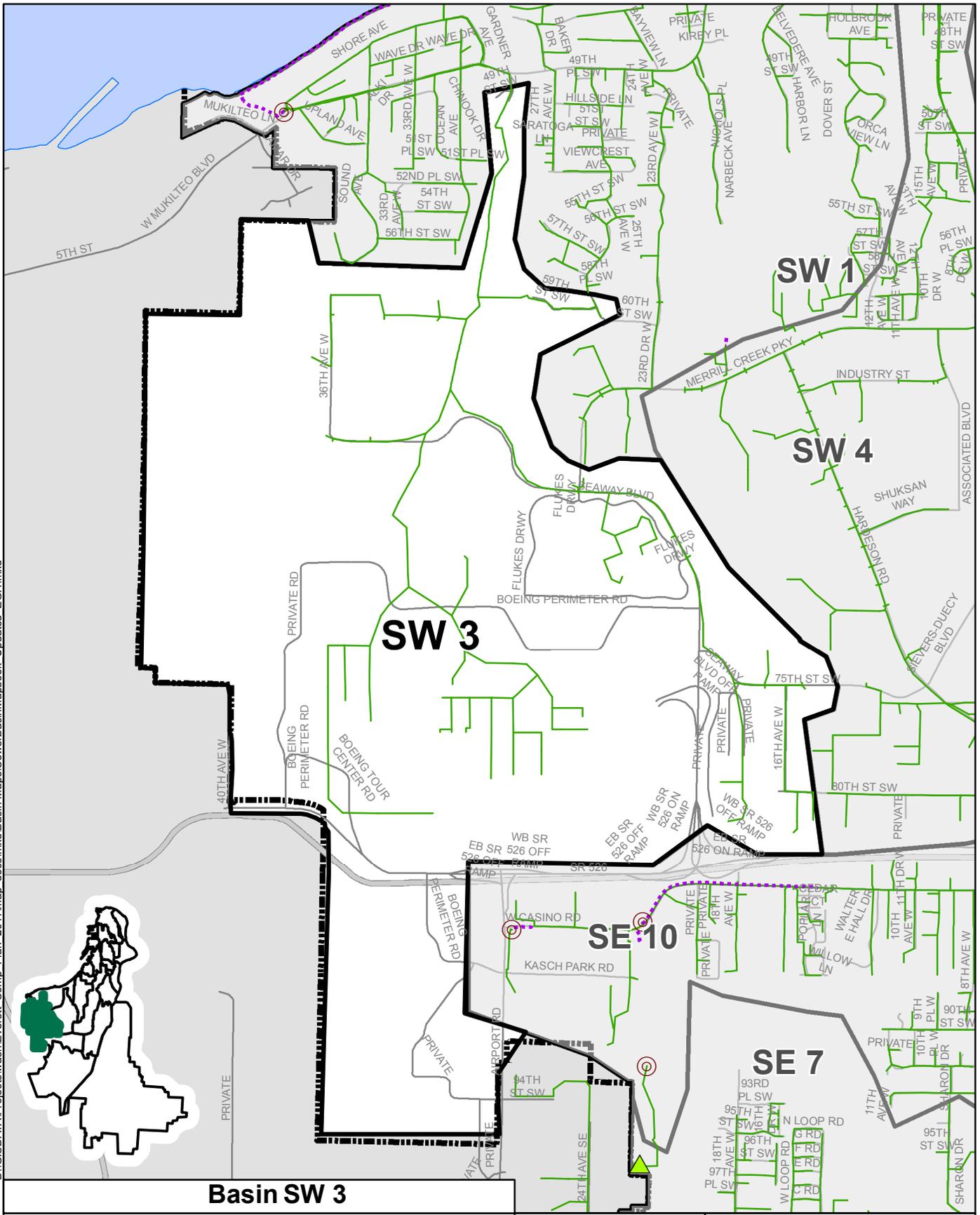
CIP ID	Description	Cost
	<i>CIP Year 2015-2024</i>	
	<i>CIP Year 2024+</i>	

COMMENTS

Note 1. All costs presented in this basin plan are in 2014 dollars.

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Basin SW 3

Sewer Main	24" and over Force Main	10-Year CIP Facility
Regulator	Less than 24" Force Main	Sewer Main CIP beyond 10-Year
Weir	Sewer Basin	Facility
CSO Outfall	Water body	Sewer Main
Active City Sewer Lift Station	Street	
	Highway	
	Everett City Boundary	



1 inch = 1,903 feet



0 600 1,200 1,800 Feet

BASIN PLAN

City of Everett

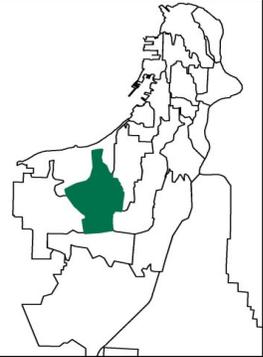



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BASIN SW_4

BASIN DESCRIPTION

Location	North of SE Basins, Harbor View, Seahurst, Glenhaven area; bordered by SR 526, Seahurst Avenue, Lower Ridge Road, Merrill Creek Pkwy.
Area	1,120 acres
Sensitive Areas	Significant wetlands; significant slopes greater than 15%; Merrill Ring Creek
Major Arterials	Sievers Duecy Blvd, Glenwood Avenue, Hardsan Road, Merrill Creek Pkwy
Large Users	Stockpot, Overall Laundry, Fish Processors
Land Use	Mostly office/industrial and heavy industrial with some single and multi-family dwellings
Future Development	The growth in this basin is expected to be mainly industrial and office/industrial park. Future flows were estimated assuming development to full land use designation.



SANITARY SEWER FLOWS

Year 2013 (gpd)	479,279
Year 2036 (gpd)	589,705
Year 2100 (gpd)	868,693
Growth (2036) %	23%
Growth (2100) %	81%
Undeveloped parcels	32.01 acres (51 parcels)
Unsewered Areas	8 acres (15 parcels)

EXISTING SYSTEM

Combined or Sanitary	Separated Sanitary
Total Length of Pipe	14.6 miles
Upstream Basins	None
Downstream Basins	None
Flow Meter	SFE 07 (1/09-5/09), SFE 16 (6/09 - 8/09), SFE 21 (8/09 - 11/09), SFE 22(11/09 - 4/10)
Receiving Facilities	Mukilteo Beach Interceptor to LS1 to SW Interceptor to SEI
Existing Lift Stations	None
Existing Diversion	None
CSO/SSO	SSO LS1
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	2.88
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	4.5

CIP

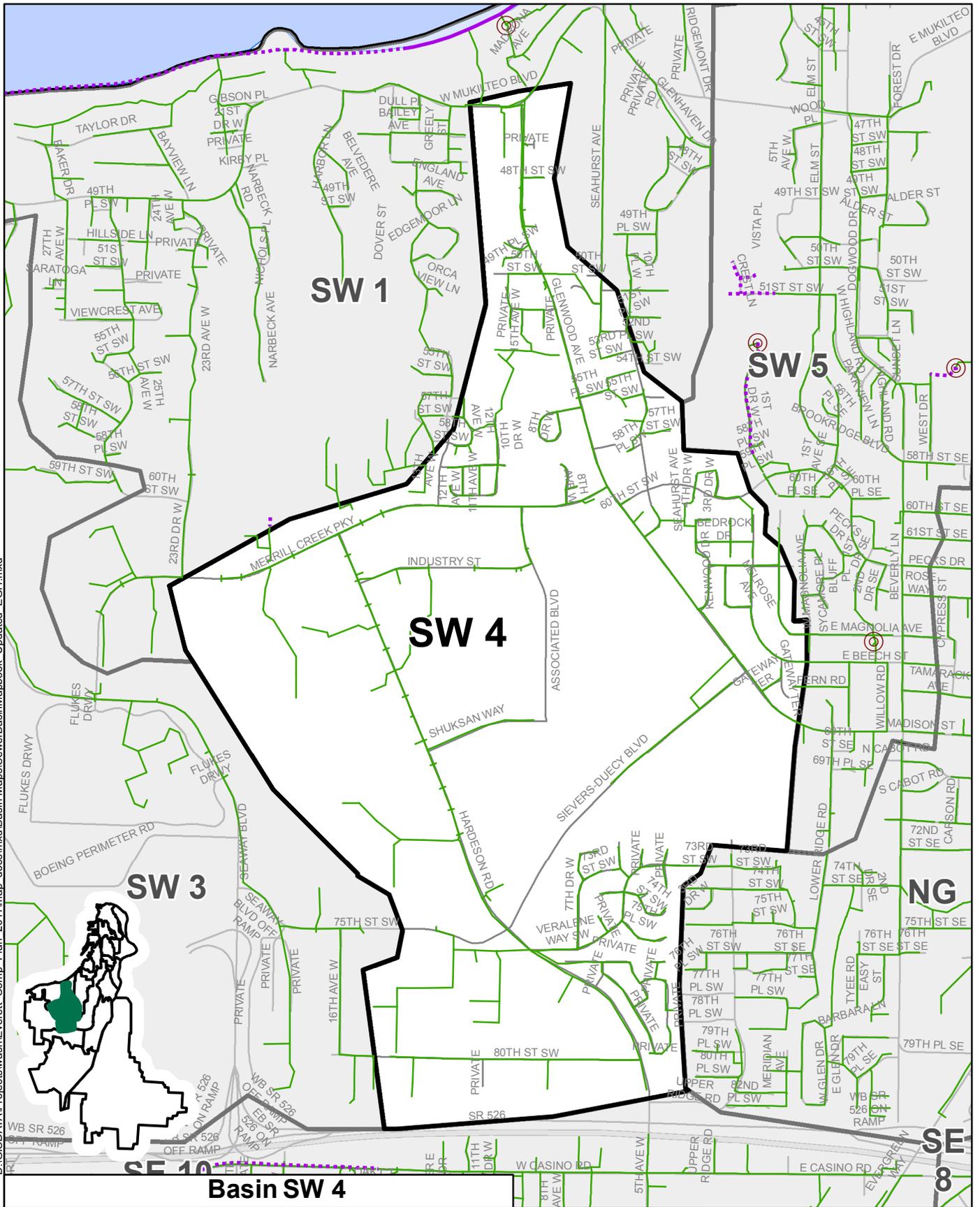
CIP ID	Description	Cost
	<i>CIP Year 2015-2024</i>	
	<i>CIP Year 2024+</i>	

COMMENTS

Note 1. All costs presented in this basin plan are in 2014 dollars.

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Basin SW 4

- | | | |
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| Sewer Main | 24" and over Force Main | 10-Year CIP Facility |
| Regulator | Less than 24" Force Main | Sewer Main CIP beyond 10-Year |
| Weir | Sewer Basin | Facility |
| CSO Outfall | Water body | Sewer Main |
| Active City Sewer Lift Station | Street | |
| | Highway | |
| | Everett City Boundary | |

1 inch = 1,598 feet

0 500 1,000 1,500 Feet

BASIN PLAN

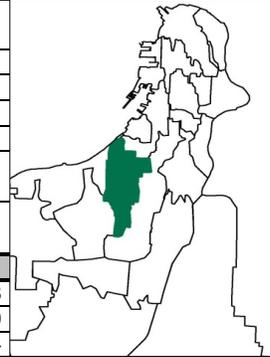
City of Everett

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BASIN SW_5

BASIN DESCRIPTION

Location	Northeast of Basins SW1 and SW4, southwest of Viewridge/Madison Area; bordered by Pigeon Creek Road, 74th Street and Olympic Boulevard
Area	837 acres
Sensitive Areas	Pigeon Creek; significant Area with slope greater than 15%; wetlands
Major Arterials	Olympic Boulevard, Mukilteo Blvd, Beverly Lane, and Dogwood Drive
Large Users	
Land Use	Mainly Residential (Single Detached and Multifamily). Some commercial and park areas at the north part of the basin.
Future Development	Mainly commercial and industrial. The residential areas are expected to develop to its full land use designation.



SANITARY SEWER FLOWS

Year 2013 (gpd)	391,838
Year 2036 (gpd)	511,569
Year 2100 (gpd)	800,324
Growth (2036) %	31%
Growth (2100) %	104%
Undeveloped parcels	78.73 acres (71 parcels)
Unsewered Areas	31 acres (51 parcels)

EXISTING SYSTEM

Combined or Sanitary	Separated Sanitary
Total Length of Pipe	16.0 miles
Upstream Basins	None
Downstream Basins	None
Flow Meter	SFE 10 (1/09 - 5/09)
Receiving Facilities	LS1 to SW Interceptor to SEI
Existing Lift Stations	3 small local lift stations not included in the model; LS 01 pumps to the Southwest Interceptor
Existing Diversion	None
CSO/SSO	SSO LS1
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	2.68
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	4.2

CIP

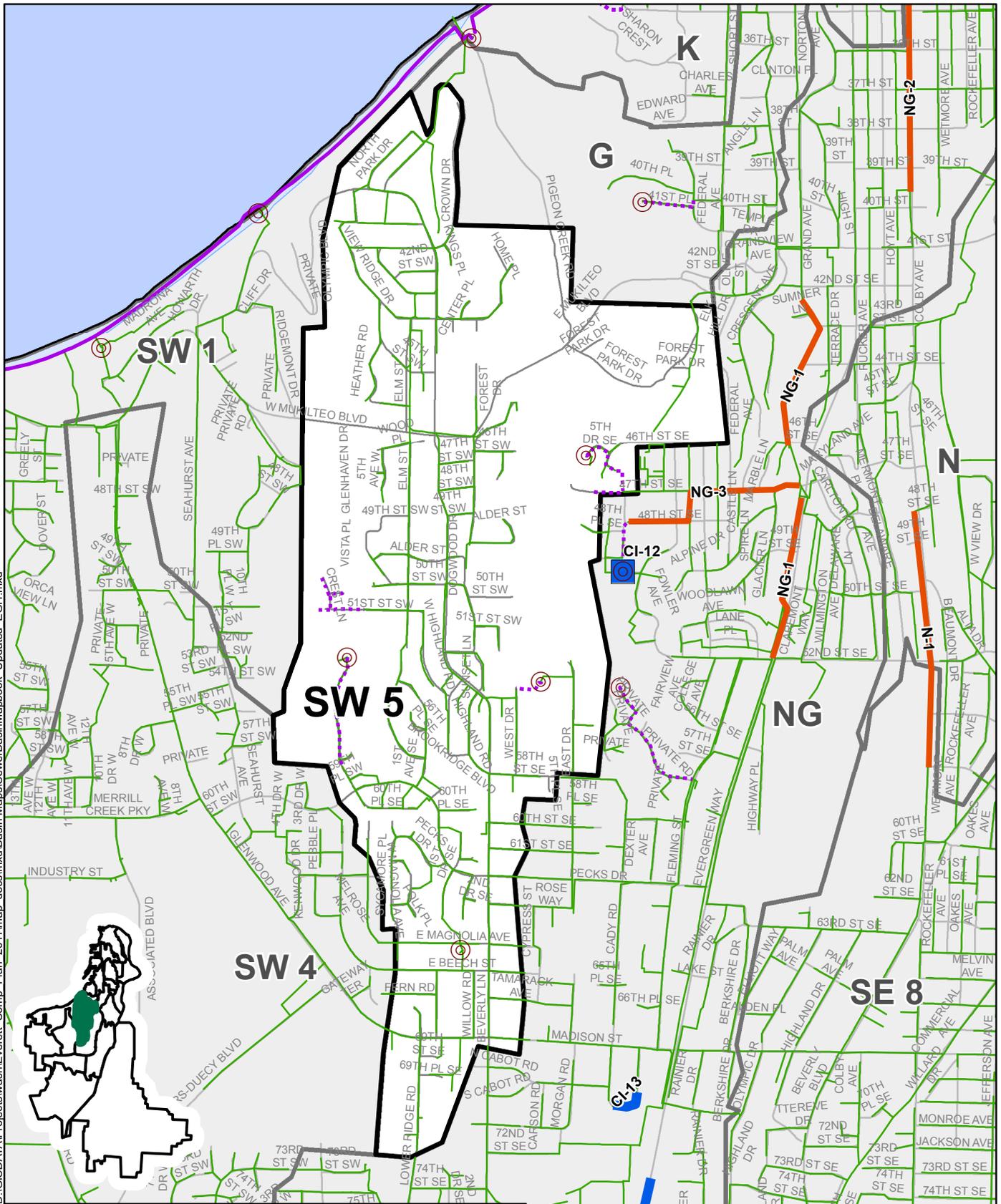
CIP ID	Description	Cost
	<i>CIP Year 2015-2024</i>	
	<i>CIP Year 2024+</i>	

COMMENTS

Note 1. All costs presented in this basin plan are in 2014 dollars.

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Basin SW 5

Sewer Main	24" and over Force Main	10-Year CIP Facility
Regulator	Less than 24" Force Main	Sewer Main CIP beyond 10-Year
Weir	Sewer Basin	Facility
CSO Outfall	Water body	Sewer Main
Active City Sewer Lift Station	Street	
	Highway	
	Everett City Boundary	

1 inch = 1,675 feet

BASIN PLAN

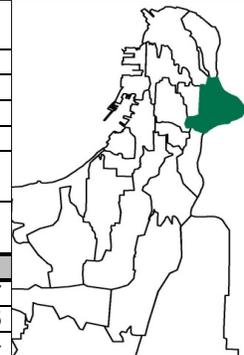
City of Everett

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BASIN T-Q

BASIN DESCRIPTION

Location	Riverside Area; bordered by Snohomish River, Chestnut Street, Hewitt Avenue, and 19th Avenue
Area	482 acres
Sensitive Areas	Some slopes greater than 15%; Snohomish River
Major Arterials	I-5
Large Users	
Land Use	Mainly residential with an important heavy and light industrial area at the east of the basin. Some commercial around main arterials.
Future Development	The growth in this basin is expected to be mainly commercial and industrial. Residential areas are expected to develop to their land use designation.



SANITARY SEWER FLOWS

Year 2013 (gpd)	194,757
Year 2036 (gpd)	288,945
Year 2100 (gpd)	488,144
Growth (2036) %	48%
Growth (2100) %	151%
Undeveloped parcels	6.31 acres (116 parcels)
Unsewered Areas	13 acres (6 parcels)

EXISTING SYSTEM

Combined or Sanitary	Combined
Total Length of Pipe	11.6 miles
Upstream Basins	None
Downstream Basins	None
Flow Meter	SFE 26A and 26B (5/10 - 12/12), HDR-17 and HDR-18 (4/12 - 12/12)
Receiving Facilities	South End Interceptor/ Snohomish River CSO Interceptor
Existing Lift Stations	LS41 to South End Interceptor, LS39 (Stormwater only), LS32
Existing Diversion	R LS 32 (controls the flow to the LS 32), R 39 (diverts the flow to Trunk N)
CSO/SSO	SRO4, Summit Avenue Interceptor to SRO3.
Dryweather Peak Flow (2100) at connection with the receiving facility (mgd)	1.72
Wetweather Peak Flow (2100/25-year, 24-hour) at the connection with the receiving facility (mgd)	103.6

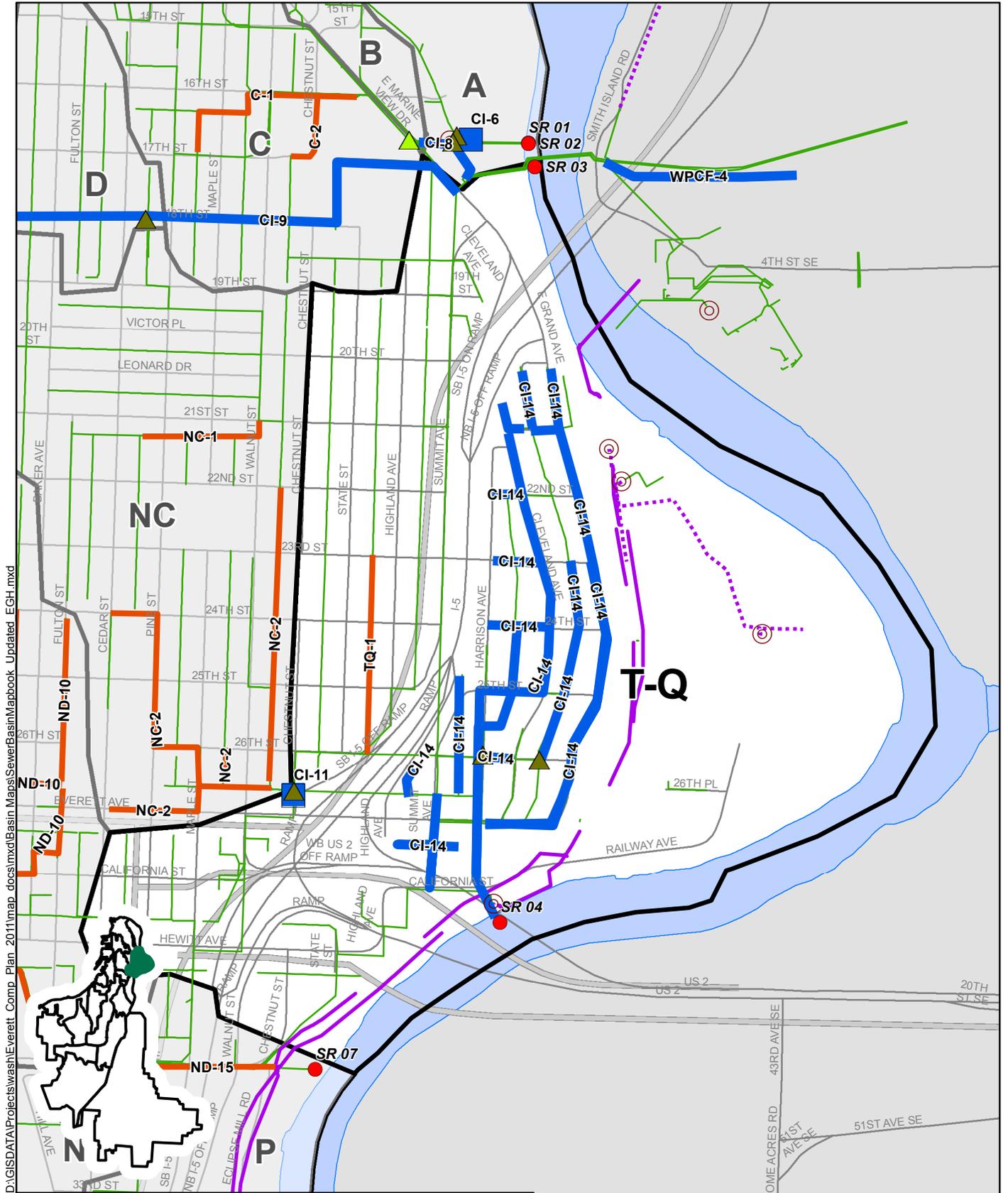
CIP

CIP ID	Description	Cost
CIP Year 2015-2024		
CI-14	<p>E Grand Sewer Replacement</p> <p>Description: This project would install separate stormwater conveyance facilities in the area between Grand Avenue and I-5 from US 2 to 20th Street. Stormwater would be treated in a filter vault before discharging to SRO4. The project also replaces sewer mains.</p> <p>Justification: The project would replace existing sewer mains that have been identified for condition replacement. The stormwater separation is anticipated to reduce CSO events at SRO4.</p>	\$ 3,540,000
CIP Year 2024+		
TQ-1	<p>State St from 23rd to 26th St</p> <p>Description: The project would consist of the installation of approximately 1350 LF of 18-inch sewer main to increase conveyance capacity on State Street from 23rd Street to 26th Street from SMH2095J05 to SMH2095S14.</p> <p>Justification: Modeling analysis suggests the existing sewer main has 5-10 year LOS which is less than the City's minimum goal of 25 year LOS. There are no recorded sewer backups in the project area and monitoring should be conducted to determine if there is a risk of flooding. The implementation of the project would be contingent on further evidence that LOS does not meet the City's LOS goal. An opportunity has been identified to include GSI improvements with this project. GSI improvements would be evaluated as part of the GSI Improvement Program.</p>	\$ 1,740,000

COMMENTS

Note 1. All costs presented in this basin plan are in 2014 dollars.

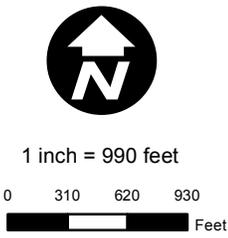
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Basin T-Q

Sewer Main	24" and over Force Main	10-Year CIP Facility
Regulator	Less than 24" Force Main	Sewer Main CIP beyond 10-Year
Weir	Sewer Basin	Facility
CSO Outfall	Water body	Sewer Main
Active City Sewer Lift Station	Street	
	Highway	
	Everett City Boundary	



BASIN PLAN City of Everett



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WPCF		
DESCRIPTION		
Location	Smith Island, on the east side of Interstate 5, adjacent to the Snohomish River and Union Slough	
Service Area	City of Everett, Mukilteo Water District, approximately 90 percent of Silver Lake Sewer District, and 11 percent of Alderwood Water and Wastewater District	
Treatment System	The trickling filter/solids contact (TF/SC) process provides secondary treatment and disinfection for up to 16 million gallons per day (mgd). The aeration/oxidation pond system treats wastewater in excess of 16 mgd.	
Plant Discharge	Effluent from each system is discharged to the Snohomish River via separate outfalls.	
SEWER FLOWS		
Population (2007)		95,819
Population (2030)		127,590
Average daily flow in the maximum winter month (2007)		29.0 mgd
Average daily flow in the maximum winter month (2030)		44.0 mgd
Average day BOD for maximum month based on a concentration of 160 mg/L (2007)		39,298 lbs/day
Average day BOD for maximum month based on a concentration of 160 mg/L (2030)		57,568 lbs/day
Average day TSS for maximum month based on a concentration of 191 mg/L (2007)		37,018 lbs/day
Average day TSS for maximum month based on a concentration of 191 mg/L (2030)		53,217 lbs/day
CIP		
Conveyance Improvements		
CIP ID	Description	Cost
	CIP Year 2015-2024	
WPCF-1	<p>WPCF South Outfall (025) Rehab</p> <p>Description: Design report detailing the modifications to the existing emergency outfall 025 to restore the functionality of the outfall. Project encompasses review of restoration alternatives for the existing outfall in regard to restoring the functionality of the outfall. In addition, alternatives for maintaining the outfall will be addressed.</p> <p>Justification: Presently the emergency outfall and diffuser assemblies are covered in silt and the outfall is inoperable. The City has verified this by performing a dive inspection of the river bottom. This outfall is required to discharge from WPCF via gravity when there are power outages. In addition the outfall would be required in the event the transmission main to the deep water marine outfall becomes damaged and could not be used.</p>	\$1,250,000
WPCF-2	<p>WPCF Replacements (HVAC)</p> <p>Description: Administration Building HVAC Replacement (\$500K); Upgrade Communications Room (\$100K)</p> <p>Justification: Existing HVAC unit is 25 years old and is beyond serviceable life.</p>	\$500,000
WPCF-3	<p>WPCF Capacity Expansion - Phase C</p> <p>Description: Add 1 Trickling Filter, 1 additional pass to the Solids Contact basin, 1 Secondary Clarifier as part of Phase C1. Phase C2 includes a WSS Thickening Facilities, 1 Anaerobic digester, and a digester support building. Phase C3 includes 1 additional digester and the evaluation and implementation of a co-generation facility that uses the methane gas generated by the digesters. The schedule for construction is Phase C1 (2014/2015), Phase C2 (2020/2021) and Phase C3 (2026/2027). The project has approval from the State to use GC/CM delivery and IMCO was selected as the GC/CM. A more detailed description of this project is provided in the WPCF Engineering Report published by Carollo Engineers dated September 2009.</p> <p>Justification: Carollo Engineers prepared the "WPCF Engineer Report" dated August 2009. The report recommended the addition to and expansion of the plant to deal with increased liquid and solid streams at the WPCF. Carollo also recommended other plant improvements based on condition assessments generated by the WPCF operators.</p>	\$75,800,000

WPCF-4	<p>WPCF - Diversion Structure No. 0 Modifications</p> <p>Description: The project would install approximately 1000 LF of 96-inch pipe from the DS-0 to discharge to the Oxidation Pond. The DS-0 structure would be expanded to accommodate the additional pipe connection and include the installation of a long weir to reduce surcharging during high flows to the Oxidation Pond. Additional modifications are needed to improve plant operator accessibility, safety and flow control function.</p> <p>Justification: The capacity of the siphon pipes between the Siphon Headworks and DS-0 is limited by hydraulic restrictions in DS-0. Installing a large diameter pipe to the Oxidation Pond would reduce surcharging in DS-0 and increase the capacity of the siphons. Although SRO3 is currently in CSO compliance, modeling analysis suggests that with the implementation of the Hayes St. regulator relocation and other various upstream interceptor improvements, SRO3 would likely no longer be in compliance. This project would increase the capacity of the siphons to convey the additional flow coming from the collection system and achieve CSO regulatory compliance.</p>	\$7,800,000
WPCF-5	<p>WPCF Lagoon Capacity Expansion</p> <p>Description: The City's Comprehensive Sewer Plan details multiple improvement projects which will increase flows to the WPCF. This evaluation will develop the Capital Improvement Plan for the WPCF to ensure the increased flows can be adequately handled by plant facilities.</p> <p>Justification: The Comprehensive Sewer Plan included a brief evaluation of the effects of the increased flows to WPCF and recommended some preliminary, planning level improvements to handle the projected peak flows from storm events. The detailed WPCF Capacity Evaluation will result in an improvement project plan with budgeting and scheduling as necessary to ensure the treatment plant can handle the increased flows</p>	\$21,500,000
WPCF-6	<p>WPCF FEN Upgrades & N CL Bldg Replacement</p> <p>Description: Modifications to the existing FEN pump station in an effort to achieve a sustainable output of 60MGD. Project includes the addition of one pump, replacement of the outfall diffusers, modification of the existing concrete wet-well structure and replacement of the undersized culverts from the finishing pond to the chlorine contact channel. In conjunction with the upgrades to the pumps station, the FEN chlorine building will be replaced along with upgrades to the chlorine distribution equipment. These upgrades will encompass a more automated system that will work in conjunction with the increased capacity and automation upgrades of the upgraded FEN pump station.</p> <p>Justification: The pump station is limited to maximum flows of just over 40 MGD. Historical large storm events have resulted in the diversion of waste water flow into the river in order to save the plant from over topping the storage ponds. Additional capacity at FEN will allow the ponds to be drained at a higher rate thus providing additional storage capacity in the ponds. The Chlorine building is supported on wooden piles which are failing. The chlorine distribution equipment is outdated and lacks the capability to increase pumping capacity without plant personnel manually adjusting the feed rates.</p>	\$5,550,000
WPCF-7	<p>12th Street NE Dike</p> <p>Description: Construction of a dike from the WPCF Polishing Pond to 12th St NE on Smith Island. This is the final dike to be constructed from permits for the Smith Island Dike Maintenance and Salmon Habitat project originally scoped in 1999.</p> <p>Justification: Provide flood protection for the WPCF. Would tie into the planned Snohomish County Smith Island Restoration dike and allow City property east of the new dikes to be part of the restoration. City is seeking mitigation credits from the City-owned property south of 12th St NE that would be part of the intertidal wetland restoration.</p>	\$1,700,000
WPCF-8	<p>Smith Island Dike Improvements</p> <p>Description: Construct new setback dikes and modify existing dikes that protect the wastewater treatment plant. Work is south of 12th Street. In 2011 the City received an one-time 5-year extension of the Corps of Engineers permit to complete the work.</p> <p>Justification: Project provides dikes for protection of treatment plant and also to meet and provide public access requirements of the shoreline master plan permit.</p>	\$2,120,000
COMMENTS		
Note 1. All costs presented in this basin plan are in 2014 dollars.		

Volume 3: Basin Plans
Appendix A
Green Stormwater Infrastructure

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1.0 Introduction

This section provides a brief overview of the considerations for management of stormwater within specific areas of the City of Everett's combined sewer basins. Potential stormwater policies and programs that could assist in the reduction of sewer backups and help meet Combined Sewer Overflow regulatory requirements are discussed.

1.1 Background and Purpose

The City of Everett (City) is preparing its 2014 Comprehensive Sewer Plan (CSP) Update of the 2006 Sewer Plan. The previous CSP was prepared in 2006 and provided guidance on needed infrastructure improvements to the City's existing sewer facilities.

Construction of the sewer system in the current north end of the City began in 1897. This portion of the system is a combined system, conveying both sanitary sewage and stormwater runoff to the Everett Water Pollution Control Facility (WPCF; treatment plant). During higher intensity storms that exceed the combined sewer system conveyance capacity, combined sewage is discharged as needed to receiving waters via permitted combined sewer overflow (CSO) outfalls. All CSO outfalls that are not currently in regulatory compliance (one overflow per year per outfall) will be required to be in compliance by the end of 2017.

High intensity storms have caused localized flooding and surcharging in the combined sewer system resulting in basement or street flooding. Managing stormwater flows to the combined sewer system can reduce localized flooding and surcharging and thereby reduce potential damage to private properties, health hazards, interruption of business, and the need for costly City utility capital and maintenance projects. Managing stormwater flows to the combined sewer system by implementing stormwater management policies, programs, and projects will help meet the City's CSO regulatory requirements.

1.2 Goals and Principles

The primary goals for managing stormwater runoff in the combined sewer areas are to:

- Reduce the amount of stormwater runoff entering the combined sewer area
- Reduce property damage
- Meet combined sewer system regulatory requirements
- Meet combined sewer system LOS goals
- Provide environmental and social benefits through system management and stormwater treatment

2.0 Recommendations for Managing Stormwater In Combined Areas

This section presents recommendations for stormwater policies, programs, and GSI projects to manage stormwater runoff in combined areas.

2.1 Stormwater Policies

On August 17, 2011, the Public Works Director (Director) signed an Interim Policy for Stormwater Control in the Combined Sewer Area. The policy applies to all new development and redevelopment that creates and/or redevelops a total of 2,000 square feet or more of impervious area, as follows:

1. Stormwater in the combined sewer area shall be controlled according to the requirements in the City's 2010 Stormwater Management Manual, with the exception of Minimum Requirement #6 – Runoff Treatment and in Minimum Requirement #7 – Flow Control, the term “a forested land cover” shall be replaced by “the existing site conditions,” provided that the resulting stormwater flow shall not increase Combined Sewer Overflows (CSOs) and/or basement flooding in the combined sewer area.
2. The cost of stormwater controls that are required in addition to requirements of the Stormwater Management Manual will be credited against the project's sewer connection charge (EMC 14.08.135).
3. No connections of roof drains to side sewers or laterals shall be allowed without prior approval of the Director.

This policy applies to all applications submitted after the effective date and remains in effect until terminated by the Director, or superseded by code adoption.

Existing Interim Policy #2-11 is expected to reduce stormwater discharges to the combined sewer system and aid in lessening future combined flows throughout the entire combined area. Thus, this interim policy is beneficial to keep in place. The combined area consists of Basins A, B, C, D, E-M, G, K, N, NC, ND, NE, NG, P and T-Q as shown in Figure 1.

Basins C, D, ND, NC, G, and T-Q have been identified as being affected by either sewer system backups or are basins that detrimentally impact CSO compliance (HDR 2011). HDR recommends that the City continue to enforce Interim Policy #2-11 in these basins. The City may consider identifying the remaining basins (A, B, E-M, K, N, NE, NG and P), as being subject to basin-specific capital facilities fees. See Figure 5 for map showing basins where capital facility fees are recommended.

Funds collected from these fees may be used to finance design, land acquisition, and construction of capital facilities recommended in the combined area in the CSP update. By paying these fees, developers in these basins will avoid the cost and land impacts of stormwater management facilities that would be required to be constructed by the developer to comply with the interim policy.

After the capital facilities are constructed and CSO regulatory requirements and levels of service are achieved, the City should re-evaluate, adjust, or terminate this fee, as appropriate (HDR 2012).

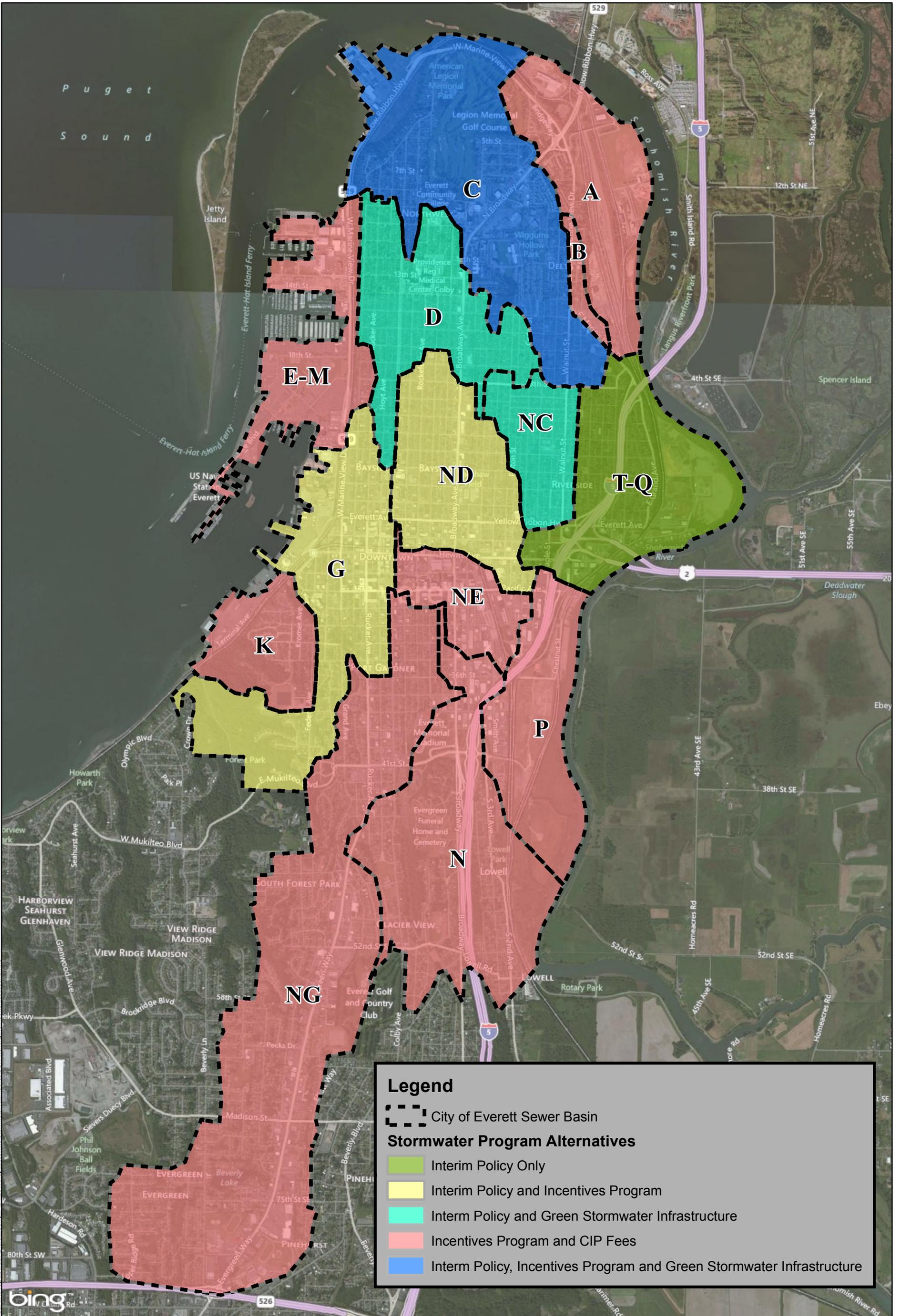
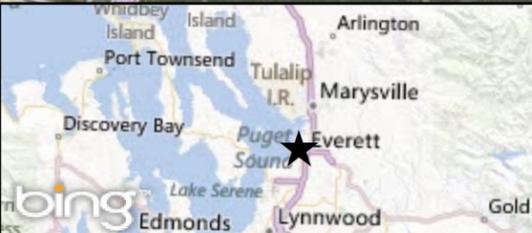


Figure 1. Sewer Basin Stormwater Policies and Programs

0 1,250 2,500 5,000 Feet



Notes

1. Sewer basin shapefiles obtained from the City of Everett GIS database.

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2.2 Stormwater Programs

HDR recommends that the City consider a residential incentives program to encourage private property owners to install stormwater management facilities that treat, detain, and/or retain stormwater runoff on-site. These on-site stormwater management facilities, or Best Management Practices (BMPs), can reduce the peak flow rates, volume, and pollutant loading of stormwater runoff from private properties tributary to the City's combined sewer system, thereby helping to meet combined sewer LOS goals and regulatory requirements. The incentives program can further help increase environmental stewardship among residents and help alleviate drainage issues on private properties, which are primary goals for managing stormwater runoff in the combined areas (Section 1.2). If implemented in portions of the combined sewer area where future separation is planned, the incentives program can also help reduce peak flow rates, volume, and pollutant loading to the new separated storm sewers and downstream receiving waters.

Recommended BMPs include downspout disconnection, rain barrels, and rain gardens. Downspout disconnection entails diverting roof downspouts from the combined sewer system and rerouting them to an approved discharge location. An approved discharge location may consist of a splash pad or on-site vegetated area if technically feasible. Disconnected downspouts may also discharge to a rain barrel or rain garden. Rain barrels are small (e.g., typically 55 gallons) storage systems that collect stormwater runoff from roof surfaces and provide water for reuse (e.g., irrigation, washing cars, etc.). Rain barrels can also help convey stormwater runoff away from building foundations by connecting low flow and overflow drains to a garden hose and conveying the stored water to a suitable discharge location. Rain gardens are depressed landscaped facilities that treat stormwater runoff and reduce peak flow rates and volumes of stormwater runoff through storage, filtration, and infiltration.

In line with the City's primary goals of helping to meet combined sewer LOS goals and regulatory requirements, we recommend that the program initially prioritize sub-basins for which future separation is not planned. We understand that future separation is not planned for basins A, B, C, E-M, G, K, N, ND, NE, NG, and P (Figure 1). Further prioritization in these basins should focus on neighborhoods for which public acceptance and participation is expected to be highest, based on public outreach, surveys, and other information to be gathered by the City. Qualifying properties should be required to confirm side sewer connections to the public sewer system.

Incentives program budgets typically consider costs for paying rebates, as well as administrative and soft costs, such as salary for construction inspectors, rebate processing, program management, public outreach, and creating materials and demonstrations. Table 1 provides a summary of possible program costs in the first year of implementation based on assumed participation and rebate amounts to be offered by the City.

Table 1. Example first year program costs based on assumed participation and rebate amounts to be offered by the City

BMP	Installations in Year 1 (#)	City-Offered Rebate Per BMP (\$)	Impervious Area Managed Per BMP (Square Feet)	Cost of Rebates in Year 1 (\$)
Rain Gardens	36 (3 per month)	\$2.50 per square foot of impervious surface controlled	800	\$72,000
Downspout Disconnection	400	\$50 per downspout disconnect	N/A	\$20,000
Rain Barrels	200	\$50 per rain barrel	N/A	\$10,000
<i>Rebates Subtotal (Year 1)</i>				\$102,000
<i>Soft Costs (Year 1)</i>				\$100,000
Total Costs (Year 1)				\$202,000

Notes:

BMP Best Management Practice
 NA Not Applicable

To estimate the volume of stormwater runoff diverted from the combined sewer system as a result of implementing the above hypothetical program example for Year 1, the following assumptions were made:

- Average annual rainfall is 38 inches per year
- Average annual roof runoff is 37.24 inches per year (approximated as 98% of average annual rainfall)
- The rain garden sizing objective is to infiltrate 91% of the average annual tributary roof runoff
- An assumed 25% of the infiltrated stormwater runoff may reenter the combined sewer system through cracked side sewers or other points of entry
- Total roof area tributary to the rain gardens is 28,800 square feet (800 square feet/rain garden x 36 rain gardens)
- Downspout disconnections and rain barrels discharge to the rain gardens

Based on these assumptions, approximately 460,000 gallons of stormwater runoff may be expected to be removed from the combined sewer system in Year 1. This was estimated as follows:

$$28,800 \text{ square feet of roof area} \times 37.24 \text{ inches of runoff per year} \times 91\% \text{ infiltrated} \times (100\% - 25\%) \text{ removed from system} \times 7.48 \text{ cubic feet per gallon} / 12 \text{ inches per foot} = 456,273 \text{ gallons (rounded to 460,000 gallons)}$$

The actual annual program cost would depend on the rebate amount offered for each BMP, the scale of the program (i.e., the number of participating properties), and the City's actual administrative and soft costs for this type of program. The scale of the program should be determined based on public willingness to participate, technical feasibility, and available program budget.

The expected benefits of the program similarly depend significantly on how the program is implemented (e.g., sizing of facilities, which basins are prioritized, number of participating properties, whether downspout disconnections are credited for flow control with no downstream rain garden or rain barrel in combined basins, etc.).

2.3 Stormwater/GSI Capital Projects

Stormwater and GSI Capital Improvement Projects (CIPs) are also needed in addition to stormwater policies and programs to help meet CSO regulatory requirements. The following text discusses the methods used to identify, evaluate, and prioritize recommended projects.

2.3.1 CIP Project Identification & Feasibility Evaluation

Potential stormwater and GSI capital projects were identified based on feasibility criteria developed for this evaluation, encompassing roadway bioretention planters and swales, green alleys, and permeable pavement parking.

2.3.2 Feasibility Consideration

The following feasibility considerations were used to evaluate the potential suitability of the various GSI Best Management Practice (BMP) types.

- **Roadway Bioretention**
 - Available space in right-of-way
 - Excessive impervious surfaces (large parking widths, driving lanes, or sidewalks)
 - Condition of existing roadway, sidewalks, and utilities on project block
 - Established trees or vegetation
 - Low (0-5%) site slopes preferred
- **Green Alley**
 - Available space in right-of-way
 - Existing alley condition and material
 - Traffic frequency and loading
 - Run-on from adjacent properties
- **Permeable Pavement Parking**
 - Excessive parking widths
 - Low site slopes
 - Traffic frequency and loading
 - Run-on from adjacent properties

HDR used available information, such as areal photography, Geographic Information System (GIS) data, historical sewer back-up complaints, and infiltration feasibility recommendations provided by HWA (2012) to perform an initial screening of potential GSI project opportunities throughout the combined sewer basin study area.

Based on this initial screening, two prioritized GSI project areas emerged: Basin NC, where planned improvements of streets and utilities offer unique opportunities to cost effectively implement a variety to GSI BMPs, and along the alignment of the planned 17th Street Interceptor improvement.

2.3.3 Driving/Walking Tour

HDR conducted a driving/walking tour of Basin NC and the planned 17th Street Interceptor project to further evaluate GSI feasibility in these priority locations. Prior to conducting the driving/walking tour, an initial Google Earth screening was conducted to provide a more focused and effective tour. HDR Staff made observations in the field on existing landscaping, roadway and nearby slopes, available space in the right-of-way, and existing landscaping.

Figures 2-4 display photos showing sites considered both feasible and infeasible for each type of GSI BMP.



Figure 2. GSI Feasibility Considerations

The picture on the left is taken looking north on the west side of Pine Street, between 22nd Street and 21st Street. Relatively wide right-of-way widths and low site slopes make this a good candidate for roadside bioretention.

The photo on the right is taken looking north on the east side of Pine Street, between Leonard Drive and Victor Place. This section of street has been identified as infeasible for bioretention due to large established trees within the right-of-way.



Figure 3. GSI Feasibility Considerations

The picture on the left is taken looking south on the east side of Pine Street, between 22nd Street and 23rd Street. Large parking areas on both sides of the roadway and low site slopes make this a potential site for permeable pavement. The photo on the right is taken looking west on the south side of 22nd Street, between Pine Street and Cedar Street. This site has been identified as infeasible for GSI due to moderate to steep grades and inadequate room within the right-of-way.



Figure 4. GSI Feasibility Considerations

The picture on the left is taken looking east along the alley between Victor Place and Leonard Drive. This site was considered to be a potential site for a green alley due to the poor existing condition of the roadway surface, adequate right-of-way availability, and low traffic frequency. The photo on the right is taken looking west along the alley between Victor Place and 19th Street. This could also be a potential candidate site for a green alley.

2.3.3 Recommended CIPs

Figure 5 shows candidate GSI capital projects for application in the public roadway rights-of-way. GSI projects are recommended for further evaluation in Basin NC, where aging sewer pipes and streets in poor conditions may offer significant opportunities to implement GSI cost-effectively as part of street and utility improvements already planned for the basin. Further evaluation of potential GSI projects along the proposed 17th Street Interceptor Project on 17th Street and 18th Street is also recommended. As with Basin NC, when the Interceptor project is constructed, GSI could be implemented as an integral part of the street and drainage restoration efforts, providing for a high cost-benefit rate of return.

See Figure 5 for schematic illustration of the most-promising blocks identified for GSI capital projects based on the field and project evaluation methods discussed above. This figure shows locations where the following BMP types are recommended for further engineering evaluation and prioritization:

- Bioretention – Planter style
- Bioretention – Curb bulb out style
- Green Alley
- Permeable Pavement Parking
- Deep Infiltration Facilities

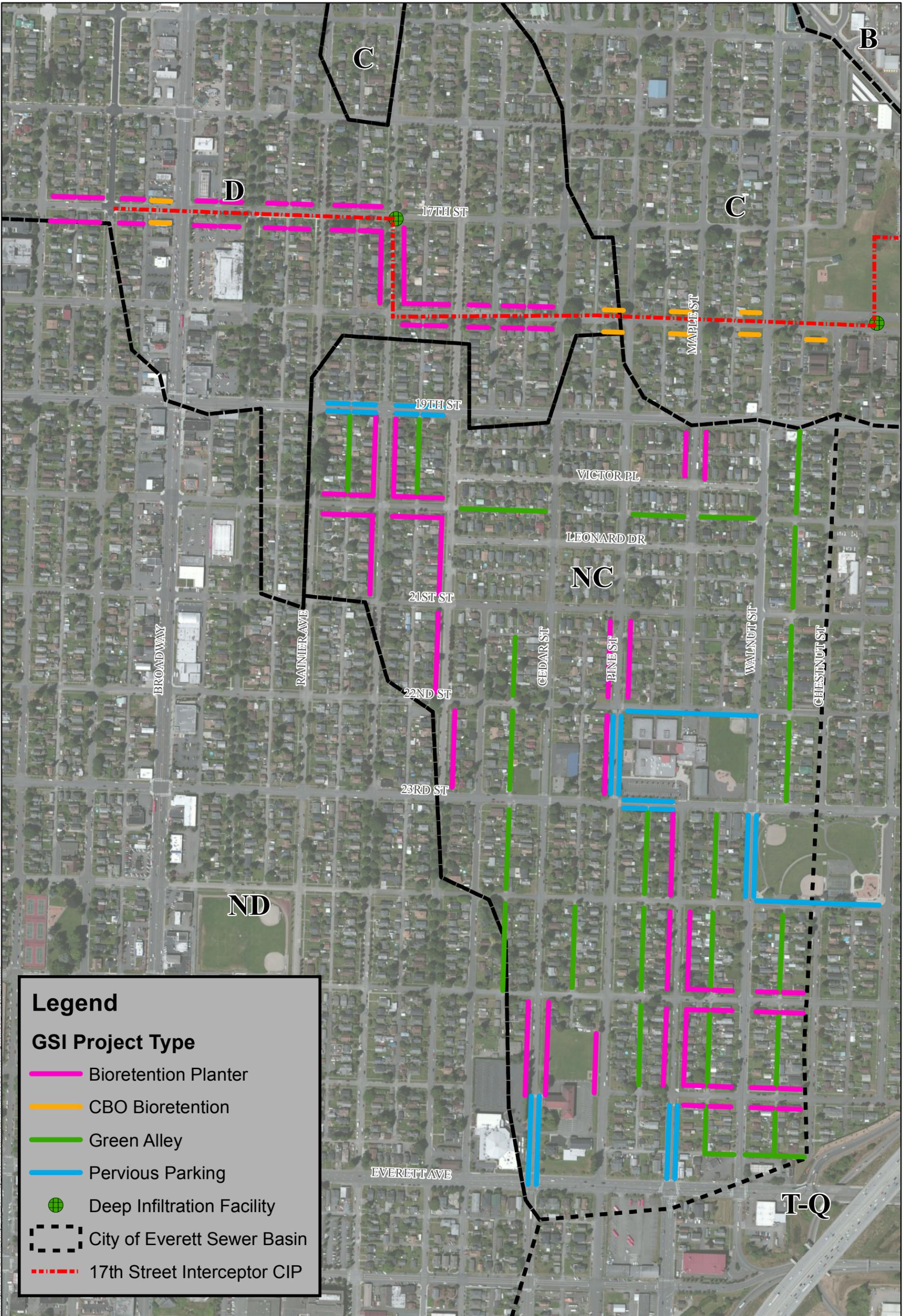
3.0 References

HWA 2012. Infiltration Evaluations: City of Everett Comprehensive Sewer Plan Update. Everett, WA. Prepared by HWA for HDR Engineering. May 2, 2012.

HDR 2011. Technical memorandum regarding Comprehensive Sewer Plan Level of Service Measures and Goals, September 12, 2011.

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King County, 2011. Technical Memorandum 810 - 2012 Comprehensive Combined Sewer Overflow Control Program Review – Green Stormwater Infrastructure Alternatives, King County Department of Natural Resources, October 2011.

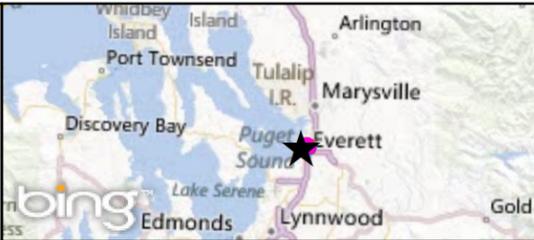


Legend

GSI Project Type

- Bioretention Planter
- CBO Bioretention
- Green Alley
- Pervious Parking
- Deep Infiltration Facility
- City of Everett Sewer Basin
- 17th Street Interceptor CIP

Figure 5. GSI Feability Evaluation



Notes

1. Sewer basin shapefiles obtained from the City of Everett GIS database.

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