RESOLUTION NO. 3049

A RESOLUTION of the City Council of the City of Bremerton, Washington, relating to the association of the Gorst UGA and provision of sewer service within the West Bremerton and Gorst Urban Growth Areas

WHEREAS, in 2006, Kitsap County adopted a ten year update to its comprehensive land use plan; and

WHEREAS, pursuant to the State Growth Management Act, Chapter 36.70A RCW, Kitsap County expanded the West Bremerton and Gorst Urban Growth Areas (UGAs) through the ten year update to accommodate population through the year 2025; and

WHEREAS, the County's ten year update was appealed to the Central Puget Sound Growth Management Hearings Board (CPSGMHB); and

WHEREAS, the CPSGMHB remanded the capital facilities element and plan of the County's comprehensive plan for, among other reasons, additional information regarding public sewer service within the West Bremerton and Gorst UGAs; and

WHEREAS, the County was instructed to obtain assurances from the relevant service providers that sanitary sewer service will be adequate and available within the 20-year planning period; and

WHEREAS, the City of Bremerton provides sanitary sewer service within the West Bremerton UGA and can provide sewer service within the Gorst UGA, and thus can provide such assurances; NOW THEREFORE

THE CITY COUNCIL OF THE CITY OF BREMERTON, WASHINGTON, DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. The City of Bremerton currently provides sewer service within portions of the West Bremerton UGA.

SECTION 2. In 2006, Kitsap County expanded the West Bremerton and Gorst UGAs pursuant to Kitsap County Ordinance No. 370-2006.

SECTION 3. The City of Bremerton operates two wastewater treatment facilities: The Westside Wastewater Treatment Plant and the Eastside Treatment Facility. The Westside Wastewater Treatment Plant has a peak wet weather capacity of 60+ MGD and a peak secondary treatment hydraulic capacity of 32.5 million gallons per day (MGD). The Eastside

Treatment Facility has a peak hydraulic capacity of 20 MGD. Currently, the Bremerton wastewater system has a current (2005) surplus of 13,102 equivalent residential units (ERUs), which translates into capacity for 32,755 additional people, which is more than enough capacity to accommodate the 2025 growth population for the City and the West Bremerton and Gorst UGAs.

SECTION 4. The City of Bremerton has the capacity and will serve the West Bremerton and Gorst UGAs upon the annexation of those areas to the City, or through Outside Utilities Agreements, which is anticipated to occur through the year 2025.

SECTION 5. Pursuant to the Bremerton Municipal Code 15.03.040, the City may extend its sewer collection service to property lying within its urban growth area which is not contiguous to City limits upon request and the execution of an Outside Utilities Agreement. The party seeking the utility extension is responsible for paying the entire cost of the sewer connection, subject to latecomer reimbursement if applicable.

SECTION 6. The City's commitment and ability to provide service to the expanded West Bremerton and Gorst UGAs is demonstrated through the "City of Bremerton Sewer UGA Planning" document, dated February 2008, attached hereto and incorporated herein by this reference as Exhibit A.

SECTION 7. The City acknowledges and accepts that Kitsap County will be "associating" the Gorst UGA as part of its comprehensive plan amendments enacted in response to the CPSGMHB Order and pursuant to RCW 36.70A.110(7). Once the association takes place, the City may annex the Gorst area.

SECTION 8. Since the City generally relies upon developer extension agreements to finance the extension of sewer collection systems outside of the City boundaries, such extensions are not shown in the City's capital facilities plan, but rather, are added once a binding commitment is finalized. Figures 10 and 12 in the City of Bremerton Sewer UGA Planning document show the proposed infrastructure for West Bremerton and Gorst, respectively.

SECTION 9. For the reasons set forth above, the City has both the capacity and/or the ability to serve its portions of the West Bremerton and Gorst UGAs with public sanitary sewer service.

SECTION 10. *Severability.* If any one or more sections, subsections, or sentences of this Resolution are held to be unconstitutional or invalid, such decision shall not affect the validity of the remaining portion of this Resolution and the same shall remain in full force and effect.

SECTION 11. *Effective Date.* This Resolution shall take effect and be in force immediately upon its passage.

PASSED by the City Council of the City of Bremerton, Washington this 5th day of March, 2008.

WILL MAUPIN, Council President

APPROVED AS TO FORM:

ROGER A. LUBOVICH, City Attorney

ATTEST:

CAROL ETGEN, City Clerk

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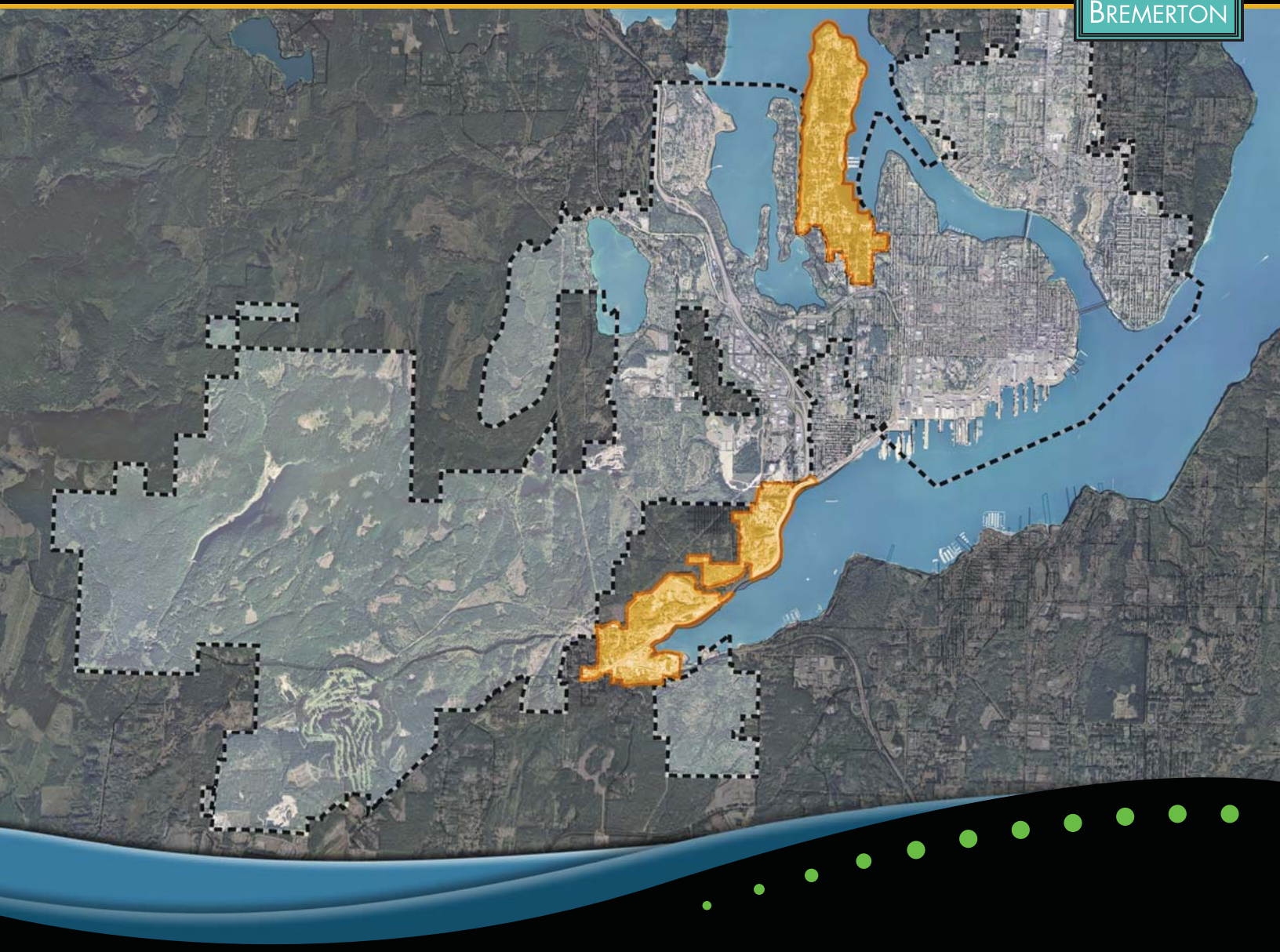
CITY OF BREMERTON



City of Bremerton Sewer UGA Planning

February 2008

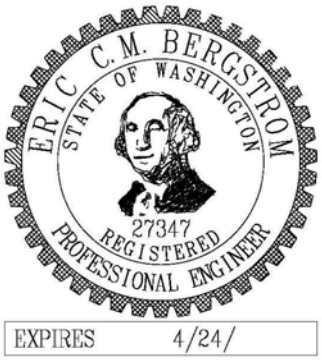
HDR

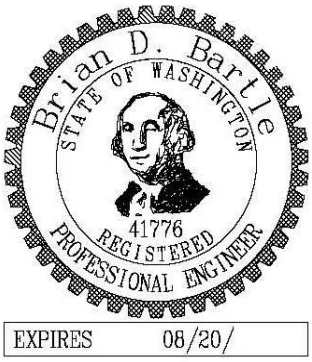
City of Bremerton

Sewer Urban Growth Area Planning

Portions of the West Bremerton UGA (Rocky Point, SR 304) and the Gorst UGA

February 2008





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1.0 Introduction

This report amends the 2006 *Kitsap County 10-Year Comprehensive Plan Update* (Comprehensive Plan) to include a strategy for providing sanitary sewer service for the Gorst Urban Growth Area (UGA) and additions to the West Bremerton UGA. Kitsap County (County) intends to add additional land area to the West Bremerton UGA, which would become part of the City of Bremerton (City) in the future. The Gorst UGA (Gorst) is contiguous to the City of Bremerton's sewer planning area. Discussions regarding its association into the City are on-going.

The purpose of this plan is to meet the requirements of the Central Puget Sound Growth Management Hearings Board Order of Continuing Non-Compliance (KCRP VI v. Kitsap County, case 07-3-0019C) by developing a sanitary sewer strategy for the Gorst UGA and the additional portions of the West Bremerton UGA (Rocky Point and SR 304) as shown on Figure 1.

In accordance with the Comprehensive Plan, the planning period for this addendum to the Comprehensive Plan ends in the year 2025. The population projections used in this addendum are consistent with those developed in the Comprehensive Plan.

The purpose of this amendment is to assess the sewage conveyance needs for the additions to the West Bremerton UGA and the Gorst UGA. Due to the topography of the studied areas, a conventional gravity-flow sewer system may not be feasible. An alternative conventional gravity system is presented for regions of the West Bremerton UGA and the Gorst UGA. Modifications to the existing system that may be required under this plan are addressed; however, the City's existing treatment and conveyance systems were assumed to have adequate capacity for additional flow. As with most sewer planning, this document is based on information available at the time of creation, including existing Comprehensive Plan documents, 25-foot contours, and previous City planning documents. As the sewer plan proceeds into design, the City should review and update, as needed, surveying, population projections, and the future planning horizon.

1.1 Plan Objectives

The objective of this plan is to meet the requirements laid out by the Central Puget Sound Growth Management Hearings Board by providing sewer planning for the Gorst UGA and additions to the West Bremerton UGA.

This is accomplished by providing the City of Bremerton with proposed infrastructure improvements, cost estimates and financing options for the Gorst UGA and additions to the West Bremerton UGA.

1.2 Description of UGAs

Areas to be added to the West Bremerton UGA include Rocky Point and SR 304, which are between the Port Washington Narrows and Dyes Inlet. Rocky Point (shown in Figure 2) is approximately 410 acres of urban low-density residential and 40 acres urban medium-density residential zoning. The City's current sewer system extends to the edge of Rocky Point with small diameter gravity sewer pipes.

The SR 304 area includes Navy Yard City (currently unincorporated) and extends south from the Westside WWTP roughly to the northern edge of the Gorst UGA. The area covered in this study (shown in Figure 3) excludes Navy Yard City and is approximately 80 acres of urban low-density residential and 122 acres of urban medium/high-density

residential. Kitsap County operates a sewer district within the northern portion of the area (Sewer District 1). The southern portion of the planning area is relatively undeveloped.

The Gorst UGA (shown in Figure 4), is located at the western end of Sinclair Inlet at the junction of SR 16 and SR 3. Gorst is primarily an industrial and small commercial center. Future plans for the area include the addition of more residential zoning to the west. Failing septic systems in the region have increased the interest in a public sewer system.

2.0 Existing System

The City of Bremerton is located in central Kitsap County near the Sinclair Inlet and Dyes Inlet. The Port Washington Narrows divide the city into two sections: West Bremerton and East Bremerton.

The City operates two wastewater treatment facilities: The Westside Wastewater Treatment Plant (Westside WWTP) and the Eastside Treatment Facility. The Westside WWTP in West Bremerton discharges secondary treated effluent to the Sinclair Inlet, and has a peak hydraulic capacity of 32.5 MGD. The Eastside Treatment Facility provides treatment for combined sewer flows during storm events in East Bremerton. The treatment involves high-rate clarification and ultraviolet (UV) disinfection. This facility discharges to the Port Washington Narrows with a peak hydraulic capacity of 20 MGD.

The sewer service area and collection system includes nine West Bremerton and six East Bremerton sewer drainage basins. A combined sewer system serves the East Bremerton drainage basins and transports sanitary and stormwater flows in a single conveyance system. Four of the nine West Bremerton drainage basins are also combined sewers. The City's gravity mains range in size from 6 to 42 inches in diameter, and force mains range from 4 to 36 inches in diameter.

Unless specified, the City is assumed to have adequate capacity in both the current conveyance system and in the treatment plants to provide service to the expanded portions of the West Bremerton UGA and the Gorst UGA.

Dyes Inlet

West Bremerton UGA- Rocky Point

City of Bremerton

City of Bainbridge Island

Port Washington Narrows

City of Bremerton

West Hills

Navy Yard City

West Bremerton UGA- SR-304

Sinclair Inlet

Gorst UGA

City of Port Orchard

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CITY OF BREMERTON

HDR

Legend

- Planning Boundary
- City of Bremerton Boundary
- ROW

0 1,500 3,000 6,000 9,000 Feet

FIGURE 1

Planning Area Vicinity Map

City of Bremerton
Sewer UGA Planning

Marine Drive
Shamrock Rd NW
Kelly Road
Holly Beach Ct.
West Bremerton UGA (Rocky Point)
Rocky Point Road NW
Dyes Inlet
NW 18th Street
NW Cartier Drive
NW Phinney Bay Drive
Bertha Avenue NW
Morgan Road NW
Corbet Drive NW
City of Bremerton
East Bremerton UGA
City of Bremerton
East Bremerton UGA

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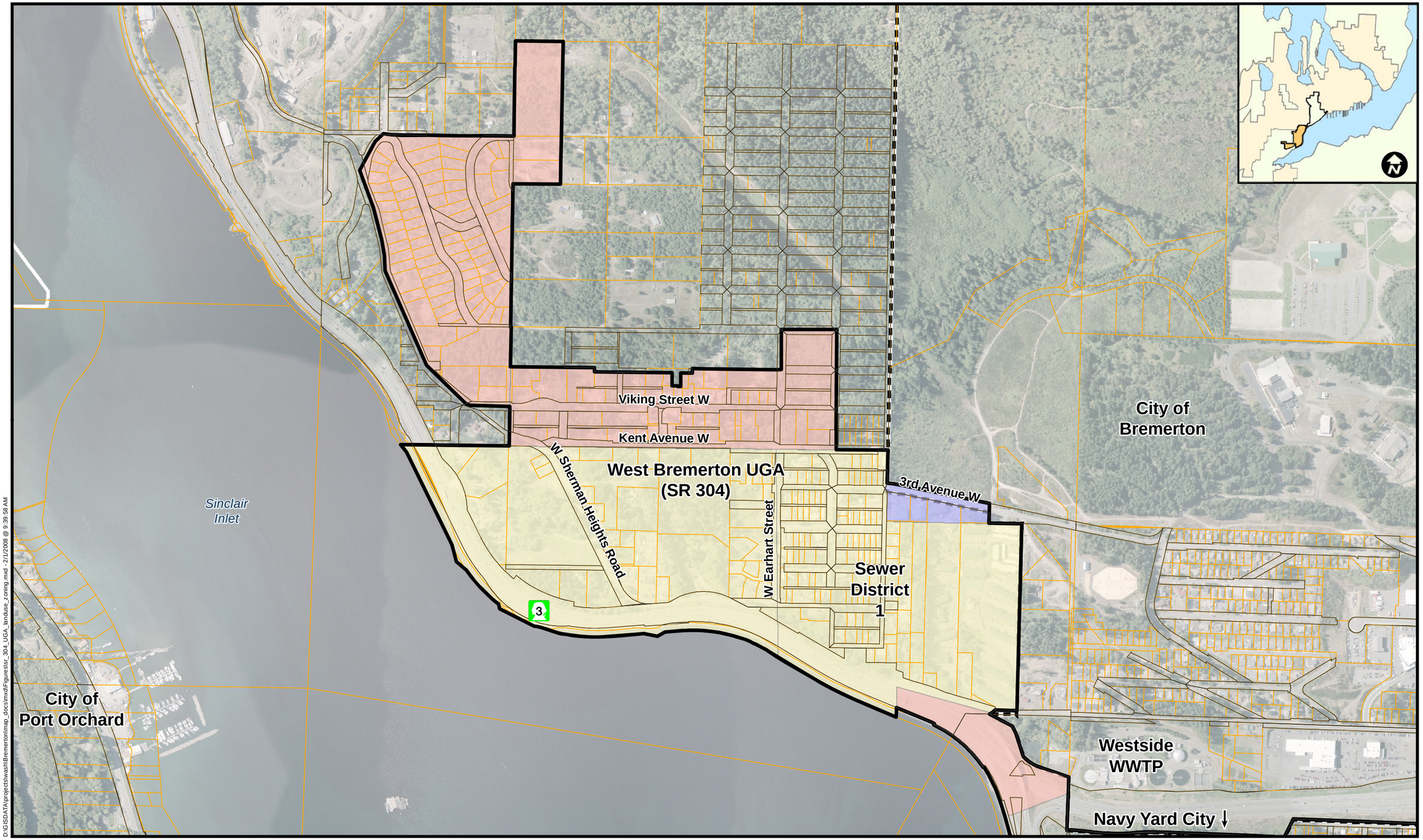
Legend

- Urban Low Residential (4-9 DU/Ac)
- Urban Medium Residential (10-18 DU/Ac)
- UGA Boundary
- City of Bremerton Boundary
- Parcel Boundary
- ROW

0 250 500 1,000 1,500 Feet

FIGURE 2
Rocky Point Land Use Zoning

City of Bremerton
Sewer UGA Planning



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Legend

- Industrial
- Urban Low Residential (4-9 DU/Ac)
- Urban Medium Residential (10-18 DU/Ac)
- UGA Boundary
- City of Bremerton Boundary
- Parcel Boundary
- ROW

0 250 500 1,000 1,500 Feet

FIGURE 3
SR 304 Land Use Zoning

City of Bremerton
Sewer UGA Planning

City of Bremerton

Gorst UGA

Sinclair Inlet

W Belfair Valley Road

Division Avenue W

Sam Christopherson Road W

W Frontage Road

Feigley Road

City of Port Orchard

City of Bremerton

3

3

16

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CITY OF BREMERTON

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0 200 400 800 1,200 Feet

Legend

- Highway/Tourist Commercial (10-38 DU/Ac)
- Industrial
- Urban Low Residential (4-9 DU/Ac)
- Urban Restricted (1-5 DU/Ac)
- UGA Boundary
- City of Bremerton Boundary
- Parcel Boundary
- ROW

FIGURE 4
Gorst UGA Land Use Zoning

City of Bremerton
Sewer UGA Planning

3.0 Planning Criteria

The planning criteria are based on flow projections, infrastructure assumptions and population projections.

3.1 Flow Projections

Flow projections include sanitary flow and infiltration/inflow (I/I). The sum of the peak diurnal sanitary flow and the I/I allowance is the peak design flow.

3.1.1 Sanitary Projections

The *2005 City of Bremerton Water Plan* estimates water usage at 85 gallons per day per capita (gpdc); the sanitary flow is assumed to be the same. A complete set of sanitary flow assumptions are provided in Table 1.

Table 1. Sanitary Flow Assumptions

	Assumption	Source
Residential	85 gal/capita/day	*2005 City of Bremerton Water Plan*
Commercial	1,500 gal/Ac/d	*Wastewater Engineering Treatment and Reuse,* Fourth Edition, 2003
Industrial	3,000 gal/Ac/d	*Wastewater Engineering Treatment and Reuse,* Fourth Edition, 2003

The Department of Ecology (DOE) Criteria for Sewage Works Design (Orange Book) recommends Equation 1 for calculating the ratio of the peak hourly sanitary flow to design sanitary flow (plotted in Figure 5). Peak hourly sanitary flow varies with the population; larger areas will have smaller peaking factors than smaller areas.

Equation 1

$$\frac{Q_{Peak}}{Q_{Design}} = \frac{18 + \sqrt{P}}{4 + \sqrt{P}}$$

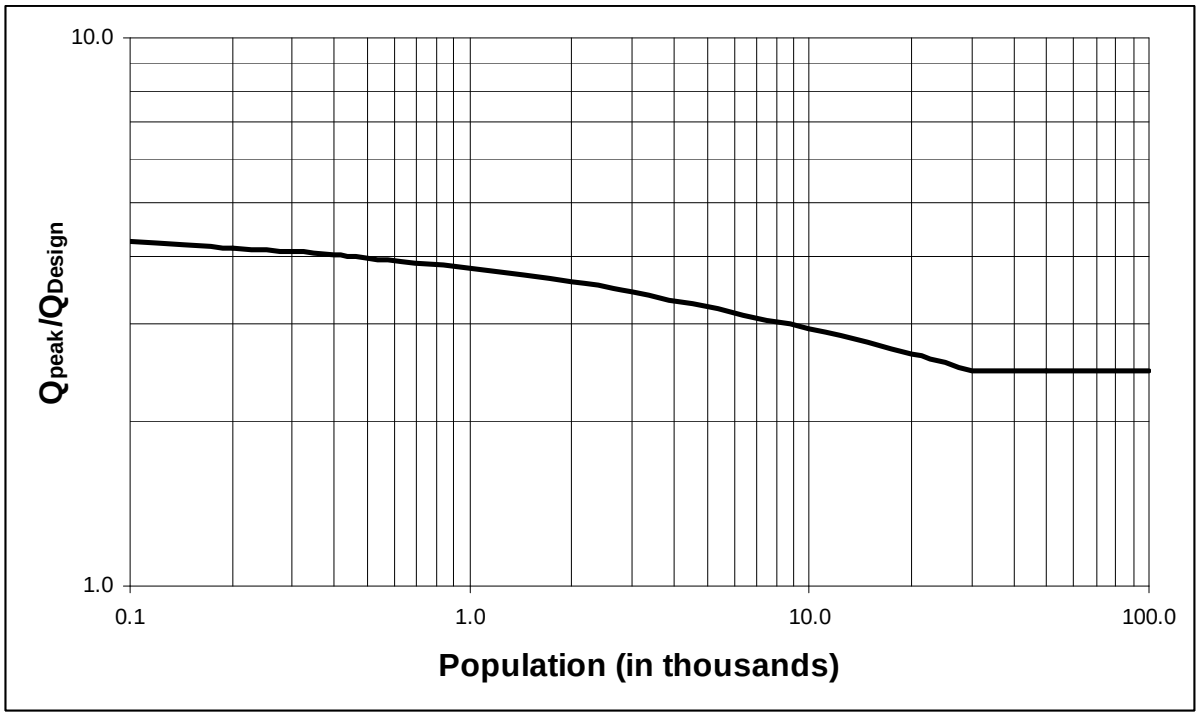
Where:

Q_{Peak} is the maximum peak hourly flow,

Q_{Design} is the design average daily wastewater flow, and

P is the population in thousands.

As recommended by DOE, the peaking factor used in this planning study is never below 2.5.



Adapted from: Washington State Department of Ecology. *Criteria for Sewage Works Design*. November 2007.

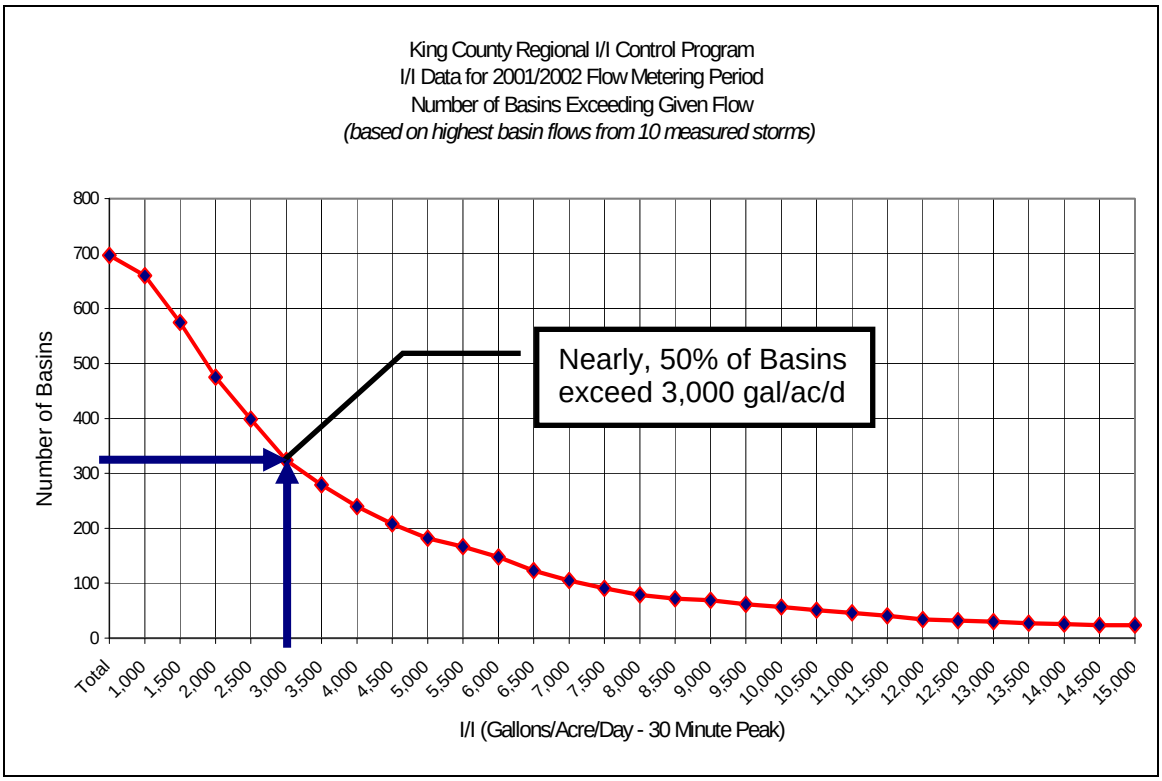
Figure 5. Ratio of Peak Hourly Flow to Design Average Flow

3.1.2 Inflow and Infiltration Projections

The definitions of inflow and infiltration (I/I) from the *Joint WEF Manual of Practice FD2 – ASCE Manual and Report on Engineering Practice No. 62 are*:

- *Infiltration is water that enters a sewer system from the ground through defective pipes, pipe joints, damaged lateral connections or manhole walls.*
- *Inflow is extraneous storm water that enters a sanitary sewer system through roof leaders, cleanouts, foundation drains sump pumps and cellar, yard and area drains*.

I/I creates a measurable increase in flow during storm events. Results from the *2001/2002 King County Regional Infiltration/Inflow Control Program Wet Weather Technical Memorandum* document that nearly 50-percent of all basins exceeded an I/I rate of 3,000 gal/Ac/d over ten measured storms, as shown in Figure 6. It is reasonable to assume 3,000 gal/Ac/d as the I/I rate for this study, as both new and old basins were documented in the I/I rates over 3,000 gal/Ac/d.



Adopted from: King County. *2001/2002 King County Regional Infiltration/Inflow Control Program Wet Weather Technical Memorandum*

Figure 6. Total Basins Exceeding a Given I/I Rate

3.2 Proposed Infrastructure Assumptions

Gravity sewer assumptions are provided in Table 2.

Table 2. Gravity Sewer Assumptions

Minimum 8-inch pipe
2.0 fps design velocity
Manning's Roughness Coefficient of 0.013

Force main assumptions are provided in Table 3.

Table 3. Force Main Assumptions

Minimum 4-inch pipe
Design velocity between 2.0 and 8.0 fps
Manning's Roughness Coefficient of 0.013

2025 projected population was considered in the evaluation of additional infrastructure. Gravity sewer pipe and force mains were sized based on 4 dwelling units per acre (Du/Ac) for undeveloped areas and 3 DU/Ac for developed areas. Pipe capacity is considered to be met at 80% of the full pipe capacity because gravity sewers are considered surcharged at this point. Force mains were sized based on the Hazen-Williams equation for a velocity of 2-8 fps with less than 30 ft of headloss.

The proposed pump stations should be designed to accommodate the force main friction losses and static head at the required flow rate. Because no formal pump station site analysis was completed, at the time of design, the City will need to select a location based on the availability of land.

3.3 Population Projection

County Traffic Analysis Zone (TAZ) mapping provides data to make population projections for the West Bremerton and Gorst UGAs. The population projections provided are for the 2025 planning horizon; This sewer plan accommodates those population projections. Detailed population projections and allocations are provided under each of the three areas of this planning study.

4.0 Planning Areas and Proposed Improvements

The West Bremerton UGA and Gorst UGA were divided into sewer sub-basins to aid in sizing the gravity and pressure mains based on the following factors:

1. Presence of existing infrastructure inside and outside of the UGAs.
2. The use of existing rights-of-way (ROWs) as future locations for gravity and force mains.
3. Topographic changes.
4. Tax parcels. Flows from a given tax parcel will most likely flow to a single main.
5. The design for portions of the West Bremerton and Gorst UGAs is centered on the use of a low pressure sewer (LPS) system using residential grinder pumps

The sub-basins used for planning in the Rocky Point, SR 304, and Gorst areas are shown in Figures 7, 9, and 11, respectively.

4.1 West Bremerton UGA

Two areas, Rocky Point and SR 304, are proposed to be added to the existing West Bremerton UGA. These areas are further described below. Table 4 shows the distribution of population for the West Bremerton UGA based on the sub-areas; Rocky Point and the SR 304 – Planning Area are included in this study. These populations concur with the Kitsap County Comprehensive Plan.

Table 4. West Bremerton UGA Aggregate Population

Area	2025 Projected Population
Rocky Point	2,075
SR 304 -Planning Area	729
SR 304 - Navy Yard City	1,812
West Hills	630
West Bremerton UGA	**5,246**

1. Planning for Navy Yard City and West Hills is not included in this report.

4.1.1 Rocky Point Area

Rocky Point is approximately 410 acres of urban low-density residential and 40 acres urban medium-density residential zoning. The City's current sewer system extends to the edge of the Rocky Point area.

4.1.1.1 Population Projection

According to the Comprehensive Plan, the West Bremerton UGA had a total population of 3,229 in 2000, and a projected population of 5,246 in the year 2025. The design population for flow projections for the Rocky Point area assumes a year 2025 total population of 2,075, based on County TAZ mapping. The size of each sub-basin (Figure 7) is indicated in Table 5 along with the projected population; the allocation of population to each sub-basin was determined based on the County's TAZ mapping.

Table 5. Population Projection for the Rocky Point Area

Sub-Basin ID	Zoning	Area (acres)	2025 Projected Population
RP-1	Urban Low Residential	168	775
RP-2	Urban Low Residential	113	520
RP-3	Urban Low Residential	64	320
RP-4	Urban Low Residential	23	131
RP-5	Urban Low Residential	38	164
RP-6	Urban Medium Residential	43	165
Totals	-	449	2,075

4.1.1.2 Sewer Flow Projection

Peak design flow is the sum of the peak sanitary flow and an allowance for I/I. Proposed infrastructure is based on the peak design flow provided in Table 6 and a conservative allowance.

Table 6. Sanitary Flow Projections for Rocky Point

Sub-Basin ID	Projected Population	Sanitary Flow Estimate (gpd)	Peak Sanitary Flow Estimate (gpm)	Peak Design Flow, Including I/I (gpm)
RP-1	775	65,900	177	526
RP-2	520	44,200	122	356
RP-3	320	27,200	77	211
RP-4	131	11,100	33	80
RP-5	164	14,000	40	119
RP-6	165	14,000	40	119
Totals	2,075	176,400	489	1,411

Per the Design Criteria, flow is based on 85 gpdc with an I/I rate of 3,000 gpd/Ac.

4.1.1.3 Sewer System Layout and Sizing

The recommended sewer system layout for Rocky Point is shown in Figure 8. Based on the elevations and preliminary planning, this lyout includes the use of an low pressure sewer system with grinder pumps and pressure service connections (side sewers). Service connections will use a grinder pump with a 230 gallon storage capacity to connect to small low-pressure force mains. The low-pressure side sewers will convey the sewage to a larger gravity trunk line. The recommended storage capacity provides storage during

a power outage for approximately 24 hours. It is assumed low-pressure side sewers will connect to the proposed gravity sewer trunks through manholes.

Sewer flows generated from sub-basin RP-1 will collect in a 10-inch gravity main. To accommodate peak flows from both RP-1 and RP-2, the gravity sewer main at the intersection of RP-1 and RP-2 increases to a 12-inch main. A pump station (MD-3) will be required to convey flow from RP-1 and RP-2 south to RP-4 via a 10-inch force main. An 8-inch gravity sewer will run parallel to the force main, conveying flow from RP-3 and RP-4 along Rocky Point Road north to the proposed MD-3 pump station. A 12-inch gravity main will connect to the end of the 10-inch MD-3 force main to convey flow to a second proposed pump station (MD-2) near the intersection of Kelly Road and Marine Drive (See Figure 8). MD-2 has been sized to accommodate flows from Marine Drive, which is within the City, but currently not sewered. The proposed pump station will convey flow south toward Kitsap Way via a 12-inch force main.

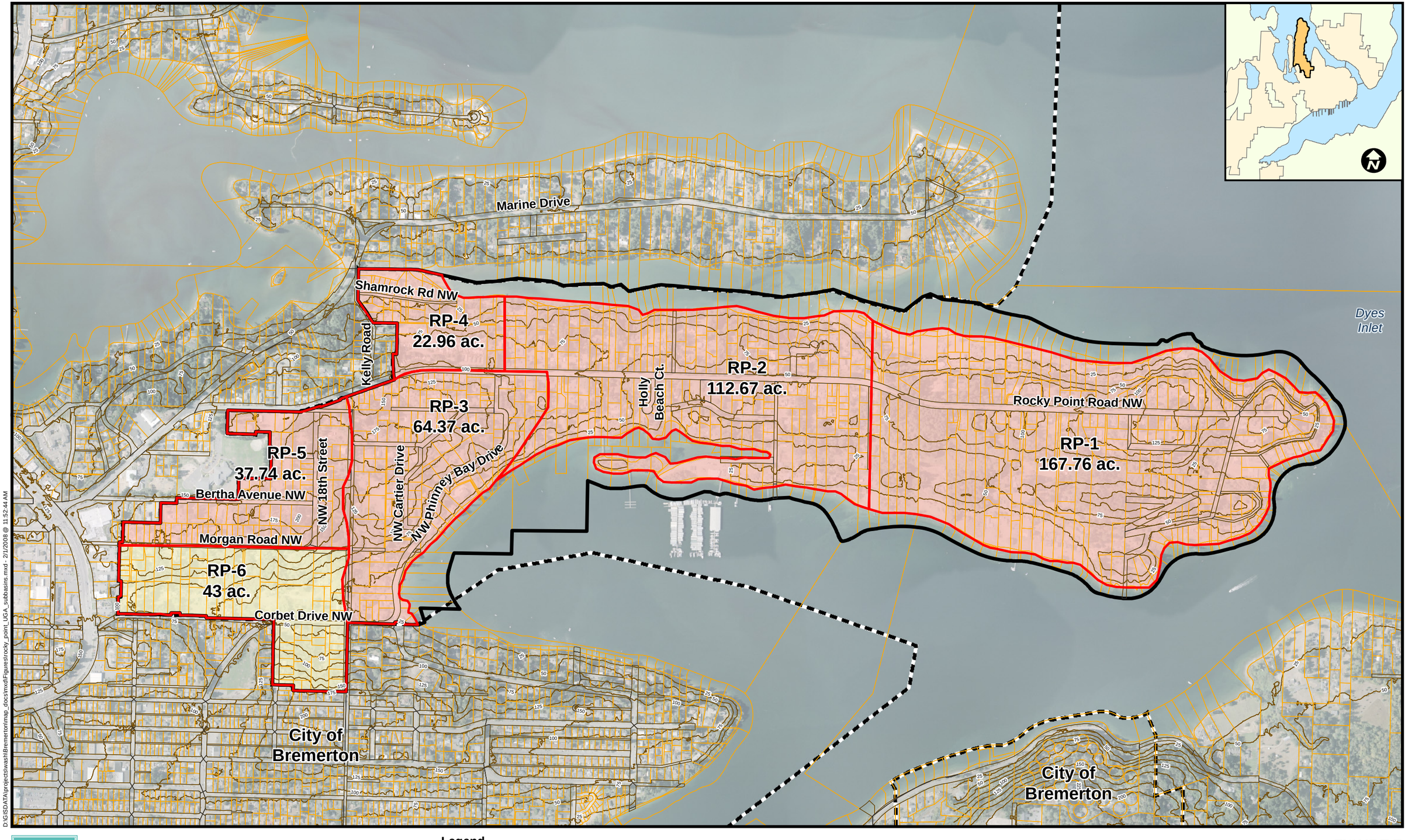
The following table summarizes the preliminary sizing of the MD-2 and MD-3 pump stations. Wet well volumes are based on the DOE Orange Book.

Table 7. Pump Station Sizing for Rocky Point

Pump Station	Wet Well Volume (gallons)	Total Dynamic Head (ft)	Discharge (gpm)	Horsepower (hp)
MD-2	6,100	150	1,620	105
MD-3	4,000	120	1,050	55

Under this proposed plan, a 15-inch gravity sewer will be installed parallel to the existing gravity mains on Kitsap Way. The City operates an existing pump station (OB-1) located along Kitsap Way. This pump station would convey the flows from Rocky Point into the City's existing conveyance system. The OB-1 pump station has a current rated capacity of 1500 gpm at 212-feet of total dynamic head (TDH). Improvements to the existing pump station may be required to accommodate increased flow from these areas. The OB-1 pump station would need to produce approximately 230 feet of pressure head, which would make it similar to the existing City pump station CW-1 being upgraded at this time.

A portion of flow generated within RP-3 can be conveyed to the City system via an 8-inch gravity main running along NW Phinney Bay Drive. The LPS system allows for service connections on the downhill side to reach this sewer main. Other service connections will reach the main via gravity flow. RP-5 and RP-6 can be served by 8-inch gravity sewers running along the existing ROWs. The central part of RP-6 should flow by LPS to the City's existing sewers along Corbet Road or proposed gravity sewers along Morgan Road NW.



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Legend

- Urban Low Residential
- Urban Medium Residential
- Sub-Basin Boundary
- UGA Boundary
- City of Bremerton Boundary
- Contour (25')
- Parcel Boundary

0 250 500 1,000 1,500 Feet

FIGURE 7
Rocky Point Sub-Basins

City of Bremerton
Sewer UGA Planning

Marine Drive

OB-1

MD-2

Shamrock Rd NW

Kitsap Way

Kelly Road

Kelly Road

MD-3

West Bremerton
UGA (Rocky Point)

Holly Beach Ct.

Rocky Point Road NW

Dyes Inlet

NW 18th Street

NW Cartier Drive

NW Phinney Bay Drive

Bertha Avenue NW

Morgan Road NW

Corbet Drive NW

City of Bremerton

East Bremerton UGA

City of Bremerton

East Bremerton UGA

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Legend

- 8" Force Main
- 8" Gravity Main
- 10" Force Main
- 10" Gravity Main
- 12" Force Main
- 12" Gravity Main
- 15" Gravity
- Low Pressure Sewer System
- UGA Boundary
- City of Bremerton Boundary
- Parcel Boundary
- Existing Bremerton Sewer Line
- ROW
- PS Pump Station

0 250 500 1,000 1,500 2,000 Feet

FIGURE 8
Rocky Point Proposed Infrastructure

City of Bremerton
Sewer UGA Planning

4.1.2 SR 304 Area

4.1.2.1 Population Projection

The Kitsap County Comprehensive Plan details land use for SR 304. Sub-basin SR-1 is already sewered and contains multiple land use zones. The projected 2025 population of SR-1 is approximately 296 according to the County TAZ mapping. The size of each sub-basin (shown on Figure 9) is indicated in Table 8 along with the allocated projected population based on the County's TAZ mapping.

Table 8. Population Projection for the SR 304 Area

Sub-Basin ID	Zoning	Area (acres)	2025 Projected Population
SR-1	Urban Medium Residential	67	296
SR-2	Urban Medium Residential	67	295
SR-3	Urban Low Residential	31	55
SR-4	Urban Low Residential	42	83
Totals	-	207	729

4.1.2.2 Sewer Flows Generated

The estimated sanitary sewer flow is determined by taking the design population and multiplying by the sanitary flow. Peak sanitary flow is a function of population as described in the planning criteria. Peak design flow is the sum for the peak sanitary flow and I/I allowance. Proposed infrastructure sizing is based on the peak design flow provided in Table 9 and a conservative allowance.

Table 9. Sanitary Flow Projections for the SR 304 Area

Sub-Basin ID	Design Population	Dry-Weather Sanitary Flow Estimate (gpd)	Peak Sanitary Flow Estimate (gpm)	Peak Design Flow, Including I/I (gpm)
SR2	295	25,000	71	210
SR3	55	4,700	14	78
SR4	83	7,000	21	108
Totals	433	36,700	106	396

Per the Design Criteria, flow is based on 85 gpdc with an I/I rate of 3,000 gpd/Ac.

4.1.2.3 Sewer System Layout and Sizing

The proposed sewer system layout for the SR 304 area is shown in Figure 10. Sub-basin SR-1 is currently sewered and is referred to as Sewer District 1. Sewer District 1 provides

a 12-inch ductile iron (DI) gravity sewer, which reduces to an 8-inch gravity sewer, along SR 3. The proposed plan includes connecting to this stub. Similar to Rocky Point, the use of an LPS can be implemented to eliminate lift stations and reduce the number of trunk lines required to serve the SR 304 in areas where gravity flow is difficult.

An 8-inch gravity sewer is proposed to run along the ROW to the currently undeveloped sub-basin SR-4. The 8-inch trunk continues west along West Sherman Heights Road through the southern portion of SR-2 and connect to Sewer District 1. Eight-inch gravity sewers are proposed to serve residences along Viking Street West and Kent Avenue West. Service connections located to the south of West Prospect Street are recommended to flow by gravity south, and service connections located north of West Prospect Street are recommended to flow north.

The northern portions of SR-2 and SR-3 can be served via a 8-inch gravity sewer running along an undeveloped ROW (Kent Avenue W). To connect this main to Sewer District 1, an easement will be needed through SR-2 due to the topography. It is assumed the exact location of the easement will be determined at the design stage.

Flow from Sewer District 1 is conveyed to the Westside WWTP through Kitsap County Pump Station #75 (KCPS-75). Currently, KCPS-75 has a pumping capacity of 470 gpm with 55 feet of TDH. The rated performance of these pumps is larger and it appears there is wear on the impellers. Under this plan, the current pumps would need to be upgraded with larger pumps (with approximately 30 HP motors) capable of handling 900 gpm. The wet well volume should also be increased to accommodate the additional flow volume from SR 304. Under the proposed plan the 8-inch force main leaving the pump station has adequate capacity to handle the increased flow from SR 304.

SR-4
42.02 ac.

SR-3
28.69 ac.

SR-2
68.46 ac.

SR-1
3.3 ac.

SR-1
55.4 ac.

SR-1
7.89 ac.

Viking Street W

Kent Avenue W

W Sherman Heights Road

W Earhart Street

3rd Avenue W

Sinclair Inlet

City of Port Orchard

City of Bremerton

Westside WWTP

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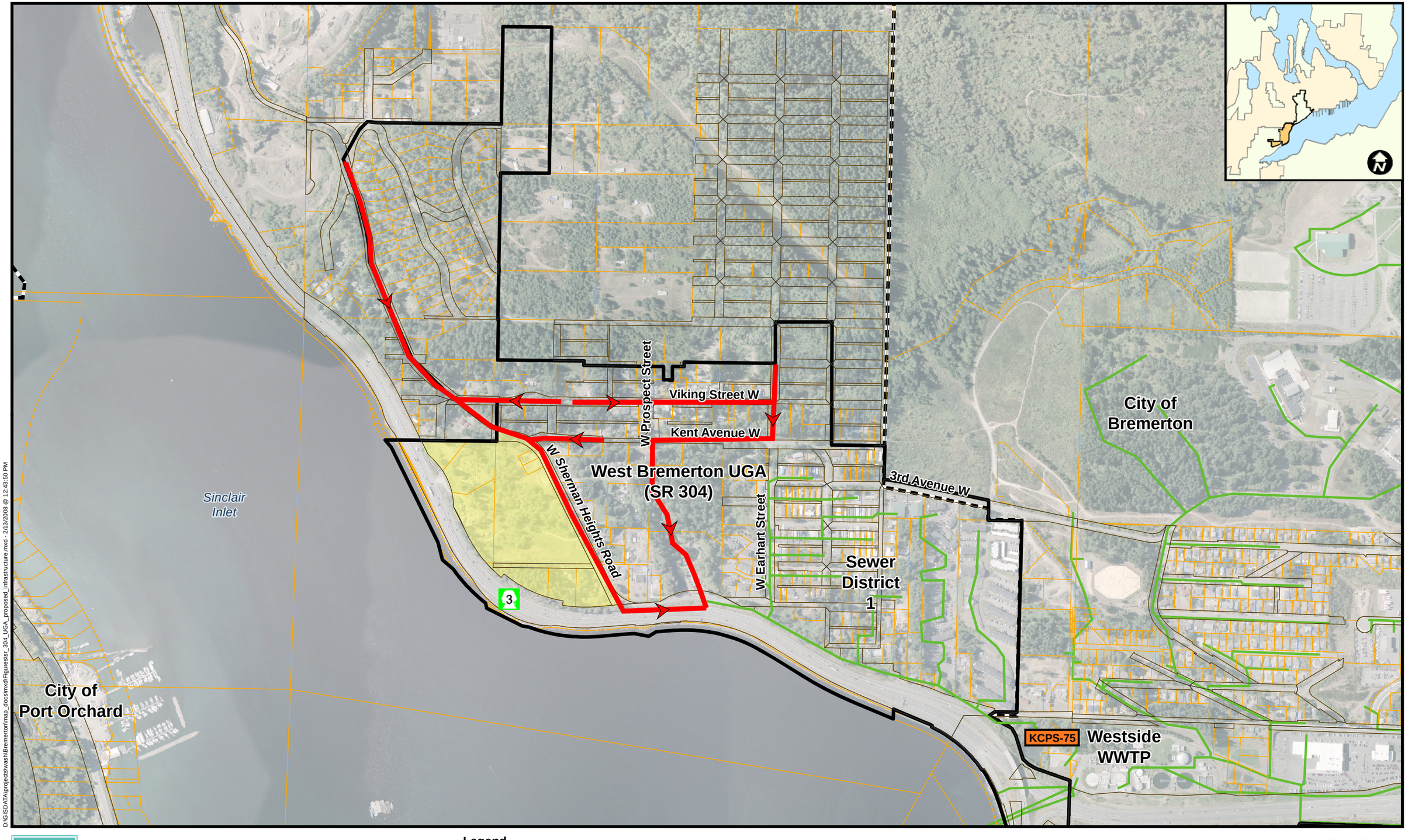
Legend

- Industrial
- Urban Low Residential
- Urban Medium Residential
- Sub-Basin Boundary
- City of Bremerton Boundary
- Contour (25')
- Parcel Boundary

0 250 500 1,000 1,500 Feet

FIGURE 9
SR 304 Sub-Basins

City of Bremerton
Sewer UGA Planning



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Legend

- 8" Gravity Main
- Low Pressure Sewer System
- UGA Boundary
- City of Bremerton Boundary
- Parcel Boundary
- Existing Bremerton Sewer Line
- ROW
- PS Pump Station

0 150 300 600 900 1,200 Feet

FIGURE 10
SR 304 Proposed Infrastructure

City of Bremerton
Sewer UGA Planning

4.2 Gorst UGA

The Gorst UGA is located at the western end of Sinclair Inlet at the junction of SR 16 and SR 3. Gorst is primarily an industrial and small commercial center.

4.2.1 Population Projection

Based on the population projection presented in the Comprehensive Plan, the Gorst UGA had a population of 154 in 2000 and is projected to have a population of 227 in 2025. The size of each sub-basin is indicated in Table 10 along with the projected population based on County TAZ mapping.

Table 10. Population Projections for the Gorst UGA

Sub-Basin ID	Zoning	Area (acres)	2025 Projected Population
GT-1	Mostly Industrial	127	-0-
GT-2	Highway/Tourist Commercial and Residential	122	227
GT-3	Mostly Highway/Tourist Commercial	85	-0-
Totals	-	334	227

4.2.2 Sewer Flows Generated

The estimated sanitary-sewer flow is determined by taking the design population and multiplying by the sanitary flow, then adding in flow for industrial and commercial areas. Peak sanitary flow is a function of population as described in the planning criteria. Peak design flow is the sum of the peak sanitary flow and the I/I allowance. Proposed infrastructure sizing is based on the peak design flow provided in Table 11 and a conservative allowance.

Table 11. Flow Projection for the Gorst UGA

Sub-Basin ID	Projected Population	Dry-Weather Sanitary Flow Estimate (gpd)	Peak Sanitary Flow Estimate (gpm)	Peak Design Flow, Including I/I (gpm)
GT1	-0-	316,500	549	814
GT2	227	204,700	355	609
GT3	-0-	145,600	253	429
Totals	227	666,800	1,157	1,852

Per the Design Criteria, flow is based on 85 gpdc with an I/I rate of 3,000 gpd/Ac.

4.2.3 Sewer System Layout and Sizing

The proposed sewer system layout for the Gorst UGA is shown in Figure 12. Topographical issues, similar to those in Rocky Point, led to the use of an LPS with grinder pumps. The Gorst UGA consists of industrial, tourist/highway commercial, urban low residential and urban restricted zones. Important infrastructure within this UGA includes SR 16 and SR 3. The design assumes that sewer lines will not cross these two major highways except to connect into the City's existing force main along SR 3.

A small section of land between SR 3 and the Sinclair Inlet has been determined to be cost prohibitive for sewer service and will remain on a septic sewer system; currently, there is one business in this section. This section is indicated on Figure 12.

The City of Bremerton is currently slip-lining an 8-inch and a 10-inch force main through an existing pipe along SR 16 and SR 3. The sewer improvements presented herein propose to connect to this force main by two proposed pump stations. One pump station (SB-3) would be located north of SR 3 along West Belfair Valley Road. The other pump station (SB-4) would be located to the south of SR 16 along West Frontage Road. These pump stations would provide the required pressure to convey sewage flow into the force main. Preliminary pump station sizing is presented in Table 12. The static head is based upon pumping into the new, slip-lined force main from the Southwest Bremerton Pump Station currently planned for construction. Adding the peak design flow from the Gorst UGA to the flow from the Southwest Bremerton Pump Station would require the use of both force mains.

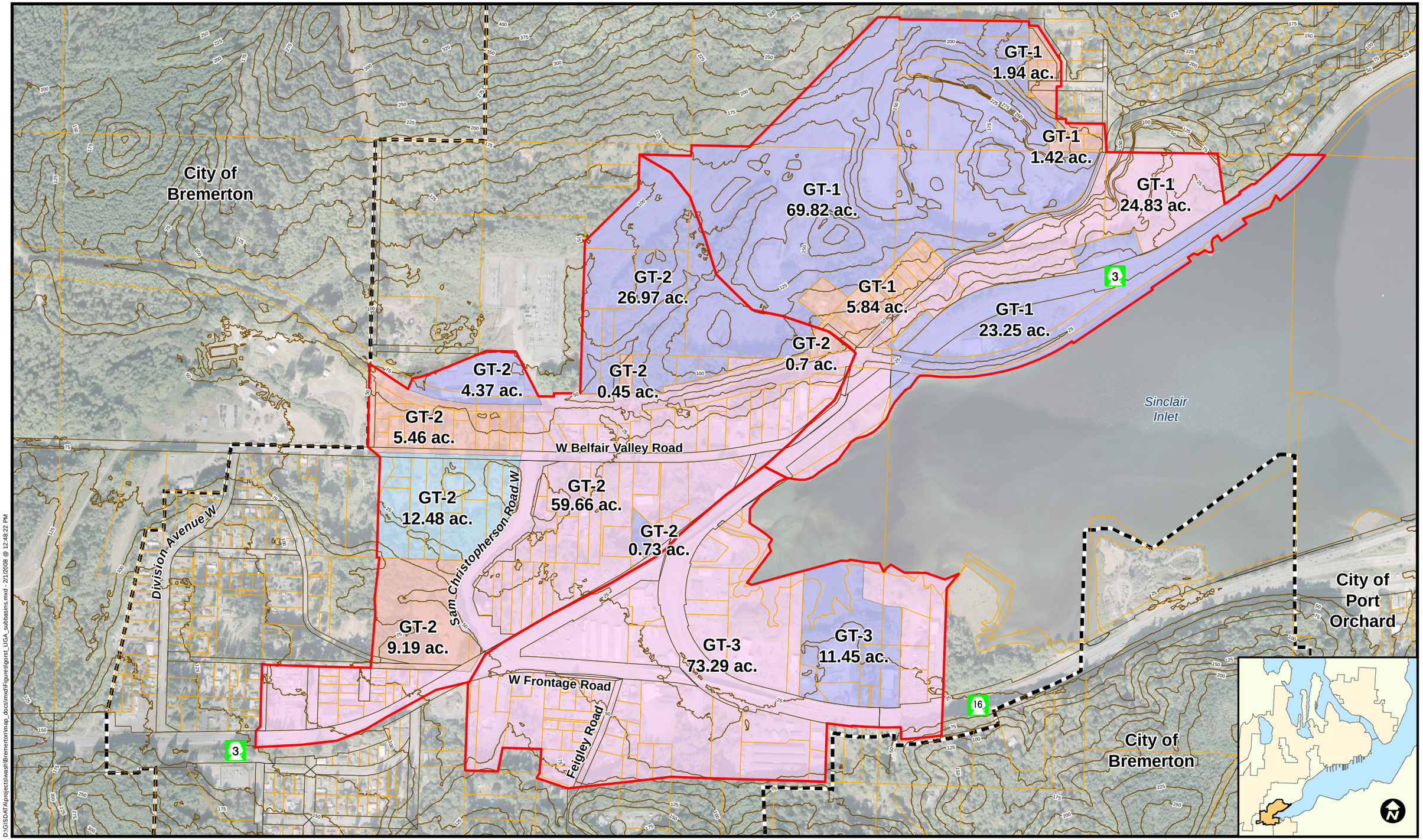
Table 12. Pump Station Sizing for Gorst

Pump Station	Wet Well Volume (gallons)	Total Dynamic Head (ft)	Discharge (gpm)	Horsepower (hp)
SB-3	5,400	155	1,435	100
SB-4	1,600	130	430	25

Sub-basin GT-1 contains primarily industrial and highway/tourist commercial zoning. Based on the assumptions stated in the planning criteria, a 12-inch gravity sewer conveying flow toward Gorst on West Sherman Heights Road should provide adequate capacity for future industrial development of this area. The 12-inch sewer would convey sewage to the proposed pump station SB-3 north of SR 3. A 10-inch force main would then convey flow into the City's future force main.

A second proposed sewer running along West Belfair Valley Road would also enter SB-3. Sub-basin GT-2 would be served by this 10-inch sewer and a second 10-inch sewer along Sam Christopherson Avenue West. The LPS is capable of conveying flows from the service connections to these gravity sewers where gravity flow is not possible.

The area south of SR 16 is zoned primarily highway/tourist commercial. To accommodate the commercial flows, two 10-inch sewers leading to a pump station are recommended. One main would run along Frontage Road and the other would run north on Feigley Road Way to tie in with the proposed main along Frontage Road. The purpose of the recommended pump station SB-4 is to convey flows to the City of Bremerton force main along SR 16 via a 6-inch force main. To accommodate flows along the Sinclair Inlet within GT-3, a LPS system could be implemented. The flow could be conveyed to pump station SB-4 by using horizontal directional drilling (HDD) under SR 3.



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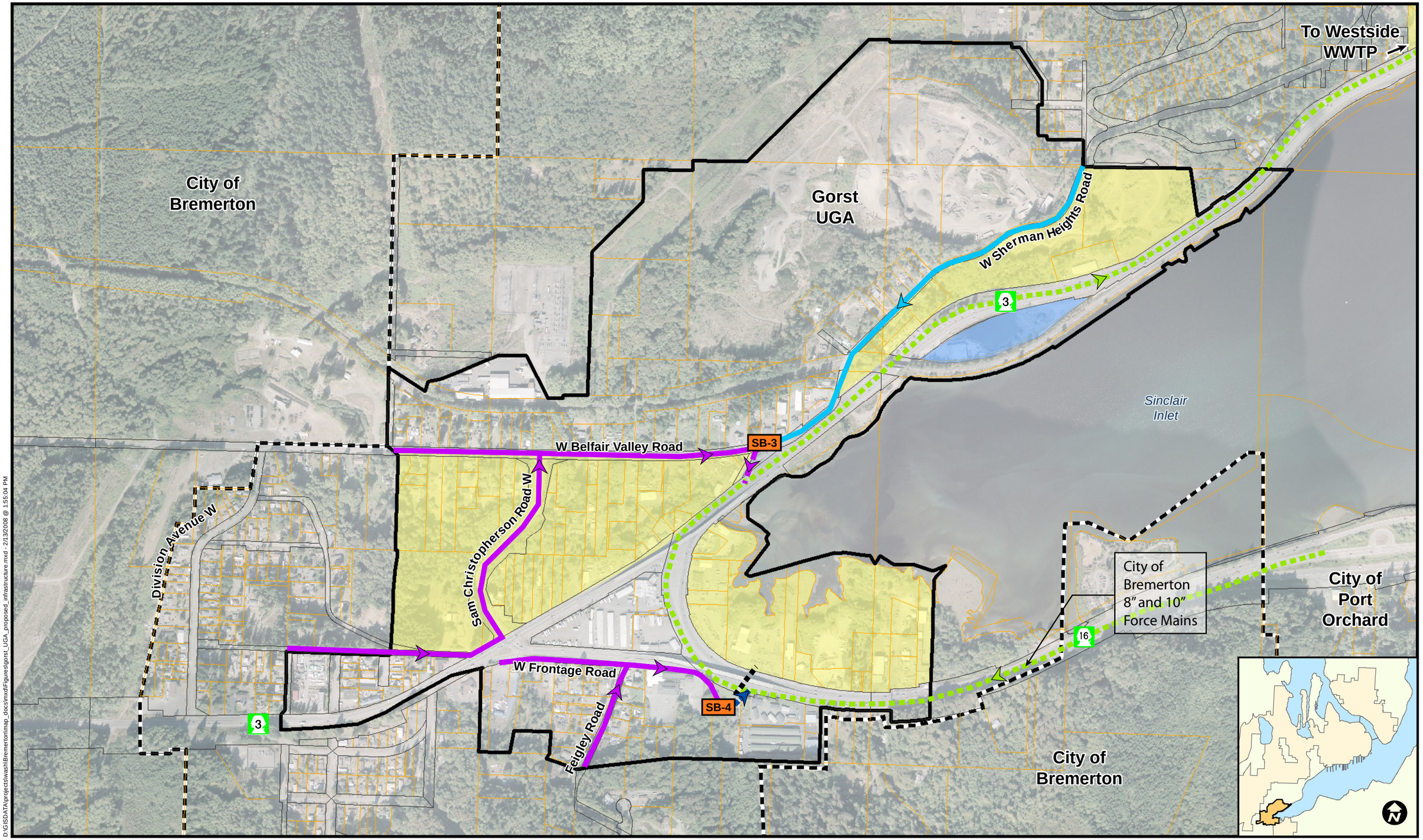
Legend

- Highway/Tourist Commercial
- Industrial
- Urban Low Residential
- Urban Restricted
- UGA Boundary
- City of Bremerton Boundary
- Parcel Boundary
- ROW
- Contour (25')

0 200 400 800 1,200 Feet

FIGURE 11
Gorst UGA Sub-Basins

City of Bremerton
Sewer UGA Planning



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Legend

- 6" Force Main
- 10" Force Main
- 10" Gravity Main
- 12" Gravity Main
- Horizontal Directional Drill
- Low Pressure Sewer System
- UGA Boundary
- City of Bremerton Boundary
- Parcel Boundary
- Existing Bremerton Sewer Line
- ROW
- Septic Sewer System
- PS Pump Station

0 150 300 600 900 1,200 Feet

FIGURE 12
Gorst UGA Proposed Infrastructure

City of Bremerton
Sewer UGA Planning

5.0 Opinion of Probable Cost

A total estimated project budget, including both an opinion of probable construction and engineering cost, for each portion of the expanded West Bremerton UGA and Gorst UGA are presented in this section.

Additionally, each planned UGA requires the use of a low pressure sewer system to serve portions of the area. The costs for the low pressure sewer system would be the responsibility of the homeowner or developer. A preliminary opinion of construction and connection cost is presented for an individual owners low pressure grinder system. Each lot wishing to connect to the City sewer system within the area designated as low pressure must provide a grinder pump station at their own cost. Once construction of the low pressure grinder pump station is installed, the homeowner would be required to provide an access easement to the City. Once the easement is completed, the City would take over maintenance and operation of the low pressure grinder pump station.

5.1 West Bremerton UGA – Rocky Point Area

An opinion of probable construction and engineering cost for the recommended conveyance system for the Rocky Point area is presented in Table 13.

Table 13. Opinion of Probable Cost for the Rocky Point Area

Item	Quantity	Unit	Unit Cost	Total Cost
Trench Safety System	29,400	LF	$2	$58,800
8-in Gravity PVC Pipe	15,000	LF	$150	$2,250,000
10-in Gravity PVC Pipe	2,800	LF	$155	$434,000
12-in Gravity PVC Pipe	3,200	LF	$160	$512,000
15-inch Gravity PVC Pipe	3,000	LF	$170	$510,000
10-in HDPE Sewer Force Main	2,400	LF	$150	$360,000
12-in HDPE Sewer Force Main	3,000	LF	$160	$480,000
48-in Manhole	80	EA	$4,500	$360,000
MD-2 Pump Station	1	LS	$850,000	$850,000
MD-3 Pump Station	1	LS	$750,000	$750,000
OB-1 Pump Station Upgrades	1	LS	$1,000,000	$1,000,000
Mobilization/Demobilization	1	LS	5%	$378,240
Temporary Erosion/Sedimentation Control	1	LS	3%	$226,944
Traffic Control	1	LS	10%	$756,480
Subtotal				**$8,926,464**
Construction Contingency	1	LS	40%	$3,570,586
Subtotal - Construction Costs				**$12,497,100**
Sales Tax	1	LS	8.6%	$1,074,751
Construction Budget - Preliminary Design Estimate				**$13,572,000**
Engineering Design	1	LS	20%	$2,715,000
Total Estimated Project Budget				**$16,287,000**

1) Pipe prices per linear foot include all bedding, backfill, excavation, soil removal, surface restoration, existing utility relocation/avoidance allowance, and pipe costs.

2) No easements or land acquisition costs included. Pipelines and pump stations assumed in public rights of way.

3) For certain properties, the landowner would be required to install a low-pressure grinder pump to connect to City services. Costs for the grinder pumps are not included.

5.2 West Bremerton UGA – SR 304 Area

An opinion of probable construction and engineering cost for the recommended conveyance system for the SR 304 area is presented in Table 14.

Table 14. Opinion of Probable Cost for the SR 304 Area

Item	Quantity	Unit	Unit Cost	Total Cost
Trench Safety System	9,420	LF	$2	$18,840
8-in Gravity PVC Pipe	9,420	LF	$150	$1,413,000
48-in Manhole	57	EA	$4,500	$256,500
Mobilization/Demobilization	1	LS	5%	$84,417
Temporary Erosion/Sedimentation Control	1	LS	3%	$50,650
Traffic Control	1	LS	10%	$168,834
Subtotal				**$1,992,241**
Construction Contingency	1	LS	40%	$796,896
Subtotal - Construction Costs				**$2,789,200**
Sales Tax	1	LS	8.6%	$239,871
Construction Budget - Preliminary Design Estimate				**$3,030,000**
Engineering Design	1	LS	20%	$606,000
Total Estimated Project Budget				**$3,636,000**

1) Pipe prices per linear foot include all bedding, backfill, excavation, soil removal, surface restoration, existing utility relocation/avoidance allowance, and pipe costs.

2) No easements or land acquisition costs included. Pipelines and pump stations assumed in public rights of way.

3) For certain properties, the landowner would be required to install a low-pressure grinder pump to connect to City services. Costs for the grinder pumps are not included.

5.3 Gorst UGA

An opinion of probable construction and engineering cost for the recommended conveyance system for the Gorst UGA is presented in Table 15.

Table 15. Opinion of Probable Cost for the Gorst UGA

Item	Quantity	Unit	Unit Cost	Total Cost
Trench Safety System	10,540	LF	$2	$21,080
10-in Gravity PVC Pipe	7,380	LF	$155	$1,143,900
12-in Gravity PVC Pipe	2,760	LF	$160	$441,600
6-in HDPE Sewer Force Main	200	LF	$125	$25,000
10-in HDPE Sewer Force Main	200	LF	$150	$30,000
48-in Manhole	35	EA	$4,500	$157,500
SB-3 Pump Station	1	LS	$750,000	$750,000
SB-4 Pump Station	1	LS	$650,000	$650,000
Mobilization/Demobilization	1	LS	5%	$160,954
Temporary Erosion/Sedimentation Control	1	LS	3%	$96,572
Traffic Control	1	LS	10%	$321,908
Subtotal				**$3,798,514**
Construction Contingency	1	LS	40%	$1,519,406
Subtotal - Construction Costs				**$5,318,000**
Sales Tax	1	LS	8.6%	$457,348
Construction Budget - Preliminary Design Estimate				**$5,776,000**
Engineering Design	1	LS	20%	$1,156,000
Total Estimated Project Budget				**$6,932,000**

1) Pipe prices per linear foot include all bedding, backfill, excavation, soil removal, surface restoration, existing utility relocation/avoidance allowance, and pipe costs.

2) No easements or land acquisition costs included. Pipelines and pump stations assumed in public rights of way.

3) For certain properties, the landowner would be required to install a low-pressure grinder pump to connect to City services. Costs for the grinder pumps are not included.

5.4 Homeowner / Developer Extension Costs

An opinion of probable construction costs to be borne by the homeowner or developer of land for the recommended low-pressure grinder pump connection fees is presented in Table 16.

Table 16. Homeowner / Developer Extension Cost Estimate

Item	Quantity	Unit	Unit Cost	Total Cost
Package Grinder Station	1	EA	$8,500	$8,500
1-1/4" Pipeline	100	LF	$20	$2,000
Decommission Existing Septic Tank	1	LS	$500	$500
Subtotal				**$11,000**
Construction Contingency	1	LS	10%	$1,100
Subtotal - Construction Costs				**$12,100**
Sales Tax	1	LS	8.6%	$1,041
Construction Budget - Preliminary Design Estimate				**$13,200**
City of Bremerton General Facility Charge	1	LS	$3,800	$3,800
Total Estimated Project Budget				**$17,000**

1) Pipe prices per linear foot include all bedding, backfill, excavation, soil removal, surface restoration, existing utility relocation/avoidance allowance, and pipe costs.

2) Package grinder station costs include engineering design, excavation, uplift protection, pump station, pumps, electrical connections, and minor landscaping.

3) Pipeline length will vary for each property. 100-LF is an assumed length.

4) Upon completion of landowner built grinder pump station, landowner will provide City with an access easement, and turn over maintenance and operation of the grinder pump station to the City.

6.0 Funding

If these proposed sewer system improvements are funded through rates, the impact on residents and businesses in the area could be significant. Because of this, the City is evaluating revenue strategies to supplement existing sources to fund these wastewater system projects. This section discusses the potential funding sources available to the City including federal, state and internal sources. Funding of these projects should be balanced against the financial rate impacts to wastewater customers.

6.1 Potential Funding Sources

The City of Bremerton is examining existing and additional revenue strategies it may want to consider when funding future wastewater system projects. This section discusses the potential funding sources available to the City including federal, state and internal sources.

Table 17 outlines the federal and state loan and grant programs available for planning, construction and emergency projects. All of them are low-interest or no-interest programs. Due to the fact that these sources rarely provide full funding of a construction project, the City will need to supplement any of these funding options with other sources of revenue to cover the total costs of any upcoming wastewater system projects.

Table 17. Funding Programs at a Glance

Loan Program	Application Cycle	When $ Become Available	Loan / Grant Limit[1]	Interest	Local Match	Term	Time to Complete Project
Public Works Board							
PWTF Planning	On-going, pending $ availability (due 5th of each month)	Upon Board approval	$100,000	0%	None	6 Years	18 Months
PWTF Pre-Construction	On-going, pending $ availability (due 5th of each month)	Upon Board approval	$1 Million	0.5 – 2% linked to local match	5 – 15% linked to interest rate (minimum of 5%)	5 Year maximum, or 20 years with proof of construction financing	18 Months
PWTF Construction	Annual – due in May	Upon Legislative approval – following spring	$10 Million	0.5 - 2% linked to local match	5 – 15% linked to interest rate (minimum of 5%)	Life of the project or 20 years maximum	48 Months
PWTF Emergency	On-going, pending $ availability (due 5th of each month)	Upon Board approval	$500,000	0 - 3%	None	Life of the project or 20-year maximum	12 Months
Department of Ecology							
Centennial Clean Water Fund	Annual – due in the Fall	Upon Legislative approval – following spring	Varies[2]	30-60% of average market rate[3]	25% for grant, None for Loan	0-5 years or 5-20 years	5 Years
State Water Pollution Control Revolving Fund	Annual – due in the Fall	Upon Legislative approval – following spring	Varies[4]	30-60% of average market rate[3]	None	0-5 years or 5-20 years	5 Years
Department of Housing and Urban Development							
Community Development Block Grant	Annual – due end of August	Upon City Council approval – following year	Varies[5]	None	None	Calendar year	Public service – calendar year, CIP – reasonable timeframe

Loan Program	Application Cycle	When $ Become Available	Loan / Grant Limit[1]	Interest	Local Match	Term	Time to Complete Project
Municipal Financing							
Revenue Bonds	None	Upon loan approval	None	Market	None	20-30 years	N/A
General Obligation Bonds	None	Upon loan approval	None	Market	None	20 years	N/A
Utility Local Improvement District	None	Upon loan approval	Voter approval required[6]	N/A	N/A	N/A	N/A

1. Loan limits are per jurisdiction, per biennium.
2. $500,000 if the match for the grant is in the form of cash or interlocal cost, $250,000 if any part of the match is in the form of in-kind goods or services, $500,000 for activities project loans.
3. 30% of average market rate for a 0 - 5 year loan, 60% average market rate for a 5 - 20 year loan.
4. Not more than 50% of available funding to any one applicant, no more than $5 million for smaller combined design-construct projects, no more than 50% of available funding for water pollution control activities.
5. City of Bremerton has a total of $500,000 to distribute to all approved applicants.
6. The maximum amount of an ULID is unlimited with funding coming from voter-approved assessments on properties within the district.

6.2 External Sources of Funds

In the past, the City has been effective at securing grant and loan funds and should continue to closely monitor future opportunities to obtain these potential funding sources. Table 18 provides a summary of the contacts for the various funding agencies.

Table 18. Funding Agency Contacts

Program	Address	Phone	Internet
Centennial Clean Water Fund	Department of Ecology P.O. Box 47600 Olympia, WA 98504-7600	(360)407-6566	www.ecy.wa.gov
Drinking Water State Revolving Fund	Department of Ecology P.O. Box 47600 Olympia, WA 98504-7600	(360)407-6566	www.ecy.wa.gov
Public Works Trust Fund	Public Works Board P.O. Box 48319 Olympia, WA 98504-8319	(360)586-7186	www.cted.wa.gov www.pwb.wa.gov
Infrastructure Database	Infrastructure Assistance Coordinating Council (IACC) P.O. Box 48319 Olympia, WA 98504-8319	(360)586-4123	www.infrafunding.wa.gov

6.2.1 Centennial Clean Water Fund

The Centennial Clean Water Fund (CCWF) provides funding to local governments and tribes for measures to prevent and control water pollution. Both grants and loans are available on a yearly funding cycle.

CCWF is the largest State Grant Program. It provides grants for planning, design, and construction of facilities and other activities related to water quality. The primary focus of the program is pollution prevention and funding projects with a quantifiable water quality benefit. In September 2005, the CCWF began the process of revising the rules which guide the direction of the funding program. The CCWF recently completed the public comment period on the changes. Proposed changes are to respond to existing and merging priorities and financial management needs including, adding new loan and grant eligibilities, additional best management practices, redistribution of program funding allocation between facilities and activities projects, providing added flexibility to the application process. These changes have been adopted and became effective for the funding cycle beginning September 1, 2007 for FY 2009.

Each public body is limited to a maximum of five funded projects per year, with a maximum of $2.5 million available for each of two projects, and a limit of $250,000 per project for the remaining three projects. Grant funding of 50 to 75 percent of a project is available depending on the type of project.

Previously, funding from this program was not available to provide excess capacity, but only to meet existing residential needs. The new language allows for projects which address water quantity issues if they will improve the water quality. Funds are available to protect a source of water supply or for water conservation or water reuse projects, if they can be shown to be a cost-effective way to solve a water quality problem.

6.2.2 State Water Pollution Control Revolving Fund

The State Water Pollution Control Revolving Fund (Revolving Fund) was created to provide loans to finance the planning, design, and/or construction of water pollution control facilities, nonpoint source pollution control management projects that implement Washington's water quality management plan, and to develop and implement a conservation and management plan.

Nonpoint source water pollution refers to pollution that enters any waters of the state from any dispersed water-based or land-use activities, including, but not limited to, atmospheric deposition; surface water runoff from agricultural lands, urban areas, and forest lands, subsurface or underground sources; and discharges from boats or other marine vessels.

6.2.3 Public Works Trust Fund

The Public Works Trust Fund (PWTF) Loan program is a loan program set up by the Legislature to assist cities, towns, counties, or special districts with funding for different types of public works projects. The projects may include streets, roads, drainage systems, water systems, or sanitary sewer systems. Projects that replace and/or repair existing water and sewer systems are given priority. No funds will be allocated to install a new system. Rather, funds will be granted to rehabilitate or replace an existing system serving an existing population.

Interest rates for these loans are typically two percent or less for a maximum term of 20 years for applications requesting 95 percent funding of the project. The interest rate decreases to 0.5 percent when municipalities provide 15 percent of the project funding. Debt service coverage is not imposed on the PWTF loan. As a minimum, the PWTF requires that cities impose a 0.25 percent excise tax on the sale of real property and have a well defined capital improvement program for the utility.

The board may also make low-interest or interest-free loans to local governments for emergency public works projects. Emergency public works projects shall include the construction, repair, reconstruction, replacement, rehabilitation, or improvement of a public water system that is in violation of health and safety standards and is being operated by a local government on a temporary basis. The loans may be used to help fund all or part of an emergency public works project less any reimbursement from any of the following sources: (1) Federal disaster or emergency funds, including funds from the Federal Emergency Management Agency (FEMA); (2) state disaster or emergency funds; (3) insurance settlements; or (4) litigation.

6.2.4 Community Development Block Grants

The Community Development Block Grant (CDBG) program was developed in 1974 to provide communities with resources to address a wide range of unique community development needs. The Entitlement Communities, of which Bremerton is one, receive an annual allocation of grants to develop viable communities by providing decent housing, a suitable living environment and opportunities to expand their economic opportunities. These grants are principally for low and moderate income persons.

As part of the funding process, the applicants attend a mandatory workshop to receive detailed information on the application process. Projects must be utilized to assist those below 50% of the median income level. The applications are then reviewed by a Community Advisory Committee and those chosen for further consideration are moved along in the process. Part of the approval process is to identify how the agencies are

using other funding sources to pay for their programs. The next step is a public comment period and is followed by final City Council approval.

6.2.5 Infrastructure Assistance Coordinating Council

Many programs exist with funding available for sewer utility capital projects. A key resource in identifying such programs is the Infrastructure Assistance Coordinating Council (IACC). The IACC comprises state and local organizations whose function is to provide funding for infrastructure repair and development. The purpose of the IACC is to assist local governments in coordinating funding efforts for infrastructure improvements. This is an important resource as the IACC will be aware of any new funding opportunities that may arise.

6.2.6 Municipal Financing

Municipal bonds are commonly used in financing long-term capital improvements for publicly owned systems. As with conventional loans, a municipality or public utility agrees to repay the lender the face value of the municipal bond plus interest. Historically, municipal bond interest proceeds and payments have been exempt from federal income tax. Therefore, these bonds have been generally issued at lower interest rates than bonds issued by private institutions.

Debt service is based on the annual principal and interest payments needed to retire the bond. The bonds can be general obligation, revenue, or assessment.

6.2.6.1 General Obligation Bonds

General obligation (GO) bonds can be issued only by a unit of government. The issuer secures it with an unconditional pledge to levy whatever taxes are necessary to pay principal and interest. This “guarantee” is viewed as the safest pledge available.

6.2.6.2 Revenue Bonds

Revenue bonds are issued with the premise that revenues from current users of the system should pay for improving or replacing the system rather than placing the burden on the general taxpayer. Bond payments are normally made from revenues such as monthly user charges and special fees, which are generated by the project being financed. No general property taxes are levied or pledged as a backup. Revenue bonds normally require the utility to provide further security in the form of a "debt service reserve," which is usually equal to a one-year requirement of principal and interest. This reserve may be completely funded initially or over time on a fixed schedule.

Revenue bonds generally do not require voter approval. Normally, there are no legal limitations on the amount of revenue bonds to be issued, but the accumulated issuance of excessive amounts may be unattractive to bond buyers because they may represent high investment risks. In addition, extensive use of revenue bonds may result in user charges which are unacceptably high to system customers.

These bonds are generally issued at a higher interest rate than are GO bonds. They normally include financial covenants insuring that proper operation and maintenance of the utility is accomplished through the collection of funds above that for the debt service. This additional income is referred to as debt service coverage and may range from 25 to 50 percent of the total debt service.

6.2.6.3 Assessment Bonds

When a project involves wastewater system improvements for adjacent properties, such as wastewater lines extending in front of residential-type development, funding is often accomplished through formation of an improvement district (ID). An ID bond is issued as a revenue bond and can be paid back from assessments against the properties benefited, or the utility may elect to use monthly user rates and revenues of the system to pay the bonds. The principle of charges for improvement district bonds is that the charge against the property must equal the benefit. Most states have very strict procedures for establishing the collection of bond funds.

6.3 Internal Funding Sources

Internal funding sources available to offset capital costs include existing reserves and fees received from new wastewater connections and existing reserves. The City's wastewater connection fees or system development charges (SDCs) should be reviewed every few years to ensure they are consistent with system planning criteria and are keeping pace with inflation.

A key indicator of financial health and viability is a utility's reserve levels. Industry standards (American Waterworks Association – AWWA) recommend that utilities maintain working capital reserves at a level adequate to handle unexpected occurrences, including unexpected cash flow fluctuations. The City currently has a policy of maintaining a cash balance of no less than 12% (45 days/365 days) of O&M expenses and repair and replacement reserves of 15% (55 days/365 days) of the total utility's operating budget.

The operating reserves protect the utility against shortfalls when expenses need to be paid before revenue is received. The operating reserve can also be used to cover unanticipated operating expenses or lower than expected revenue collections. The minimum level is a financial measure or guideline to alert management when it is time to take action to assure the operating fund will not continue to decline.

Repair and replacement reserves are used to fund the cash flow requirements of capital infrastructure construction. These reserves can increase and decrease significantly depending on funding sources available and the capital projects that are planned during the year. The minimum funding level should be based on the average annual capital expenditures for renewal and replacement of the utility's existing facilities. Annual depreciation expense is a guideline for annual capital expenditures for renewal and replacement projects.

The City should maintain the minimum balance for both of these reserves to meet the fluctuating financial requirements of the City. The timing and funding of the two minimum target reserve levels should be balanced against the potential rate impacts of the funding of capital improvements from rates. The utility should clarify its financial planning goals by establishing a target or minimum funding level for each reserve fund. Any use of these funds for capital projects should be evaluated against the impacts to these minimum target reserve levels.

Table 19 outlines internal sources of funding the City might wish to consider to supplement the loans and grants discussed above. Implementation of these strategies could have far-reaching effects as some interfund transfers may require significant cuts from some programs, departments or levels of service in order to fund wastewater projects.

Table 19. Potential Funding/Revenue Strategies

Funding Option	Description	Voter Approval Required?	Usage Issues
Reallocation of Existing Revenues/Funds			
Wastewater Operating Fund	Existing revenues are user rates, fees, miscellaneous revenues and loans. Some of these monies may be reallocated through transfer to the wastewater capital projects fund in order to fund wastewater projects.	No	At least 50% of the wastewater operating fund must be self supporting fro user charges. City policy is to maintain minimum target reserve levels of 12% of O&M. May require cuts in other programs and levels of service.
Wastewater Capital Reserve Fund	Existing revenue sources are from wastewater operating fund transfers, grants, system development charges and debt proceeds from loans to pay for capital projects.	No	City policy is to maintain minimum target reserve levels of 15% of total operating budget for future repair and replacement projects. System development charge revenue must pay for growth related portion of projects.
Other Options			
Developer Extension	Extensions to the wastewater collection system would be the responsibility of the developers	No	Requires the ability and mechanism to achieve higher density within the City's urban growth areas.

This section outlines the various funding sources, internal and external, available to the City for future wastewater projects. The City has been proactive in its financial management in the past. It has demonstrated its commitment to responsible management of the utility by funding adequate levels of operations, capital and reserves. Continued fiscal management will enable the wastewater utility to operate on a financially sound basis. All funding sources, both external and internal, should be reviewed for potential rate impacts to customers and to the City's current financial policies.

7.0 Conclusion

This report amends the 2006 *Kitsap County 10-Year Comprehensive Plan Update* (Comprehensive Plan) by providing a sanitation strategy for the Gorst UGA and portions of the West Bremerton UGA. Additional sewers and pump stations as identified in this report will be required to provide sewer service for the population projected for the West Bremerton UGA and Gorst UGA through 2025 as stipulated by the Comprehensive Plan.

8.0 References

Kitsap County 10-Year Comprehensive Plan Update, December 2006.

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