

Water and Sewer Report

Port Gamble Redevelopment Plan

PRELIMINARY WATER AND SEWER REPORT

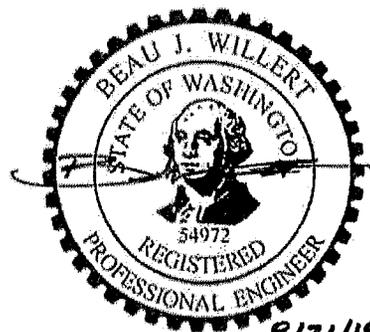
Kitsap County, Washington

Submitted by:
Pope Resources, a Delaware Limited Partnership
By: Olympic Property Group I, LLC, its manager
19950 7th Avenue NE, Suite 200
Poulsbo, WA 98370

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Prepared By:
Beau J. Willert, P.E.

Reviewed By:
Alan D. Fure, P.E.



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Table of Contents

1	PROJECT OVERVIEW.....	1
2	WATER SYSTEM.....	3
3	SEWER SYSTEM.....	5

LIST OF SUPPLEMENTAL INFORMATION

Section 2

Water Systems Exhibit

Section 3

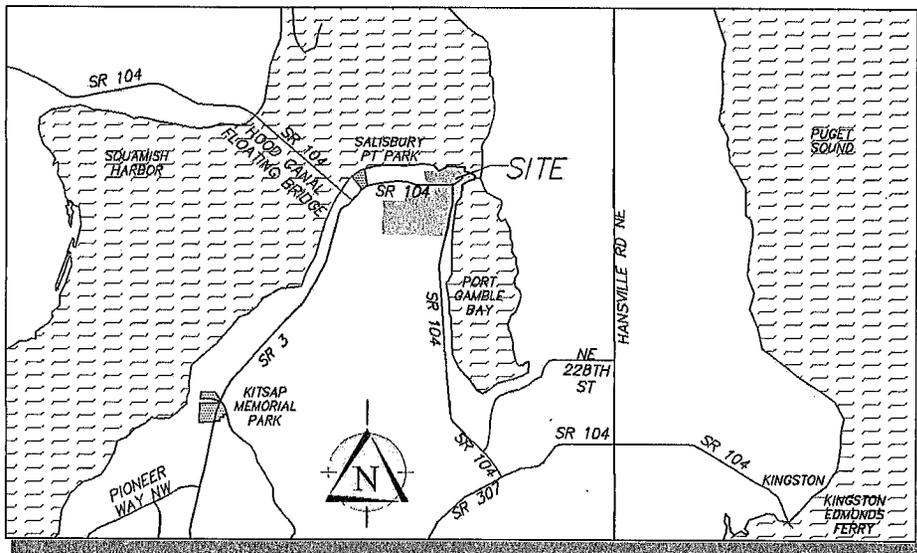
Sewer Systems Exhibit

1 PROJECT OVERVIEW

The purpose of this report is to describe the existing and proposed water and sewer services for the Port Gamble Redevelopment Plan. The project is located in Kitsap County, Washington approximately one and a quarter mile east of the Hood Canal Bridge. See the Vicinity Map below.

Port Gamble was established as a "company town" adjacent to a waterfront lumber mill in 1853. When the mill closed in 1995, it was the longest active mill in the country. The town was designated as a National Historic District by the National Parks Service in November of 1966. The project proposes to preserve Port Gamble's historical features and values while providing additional residential, commercial and retail development along with updated services and amenities. See the Project Narrative submitted with the preliminary plat submittal for a more complete description of the project.

The Port Gamble property is owned by Pope Resources, as a successor to, Pope and Talbot, who previously owned and operated the mill. The property is managed by Olympic Property Group (OPG), a wholly owned subsidiary of Pope Resources. The project consists of three areas: the mill site, which lies along the waterfront, the town site, which consists of the area of existing development on the bluffs above the mill site, and the agrarian area, which lies to the southwest of town.



VICINITY MAP

Water Summary

The existing water system service in Port Gamble contains two components, a potable water system and a fire flow system. The potable water system is served by a new Kitsap Public Utility District (KPUD) water main, which serves approximately 51 Equivalent Residential Units (ERUs). The separate fire flow system is served by surface water collected from springs and conveyed to a reservoir, east of the General Store. The separate fire flow system is currently only used to provide fire flow to the General Store. The proposed water system will be served by KPUD water and will consist of a new reservoir and distribution system.

Sewer Summary

The existing sewer system serving Port Gamble is owned by Pope Resources. It consists of a collection system, two lift stations, a membrane bioreactor, and drainfield. Over time, as the new sewer system is developed, it will be transferred in ownership to KPUD for operation and maintenance.

As part of an agreement between the Washington State Department of Ecology (DOE) and Pope Resources, the 1970s era sewage treatment plant and outfall are in the process of being abandoned and removed, with the function of the treatment plant being replaced with a new membrane bioreactor (MBR). The MBR now treats the effluent received from the lift station, which it collects from the existing collection system. Once the MBR has treated wastewater from the lift station, treated effluent from the MBR is pumped to the drainfield west of the agrarian site. Later, the existing collection system will gradually be replaced, increasing capacity by greatly reducing inflow and infiltration.

2 WATER SYSTEM

Existing Water System

The existing water system serving Port Gamble contains two components, a potable water system and a fire flow system.

The potable water system is served by KPUD through a connection to an above ground reinforced concrete, 46,000 gallon, storage tank constructed in the 1990s. In 2015, KPUD extended an 8-inch water main which now provides potable water for 51 current connections but has capacity for the proposed redevelopment. Existing water distribution lines throughout the town are generally 6 inches or smaller.

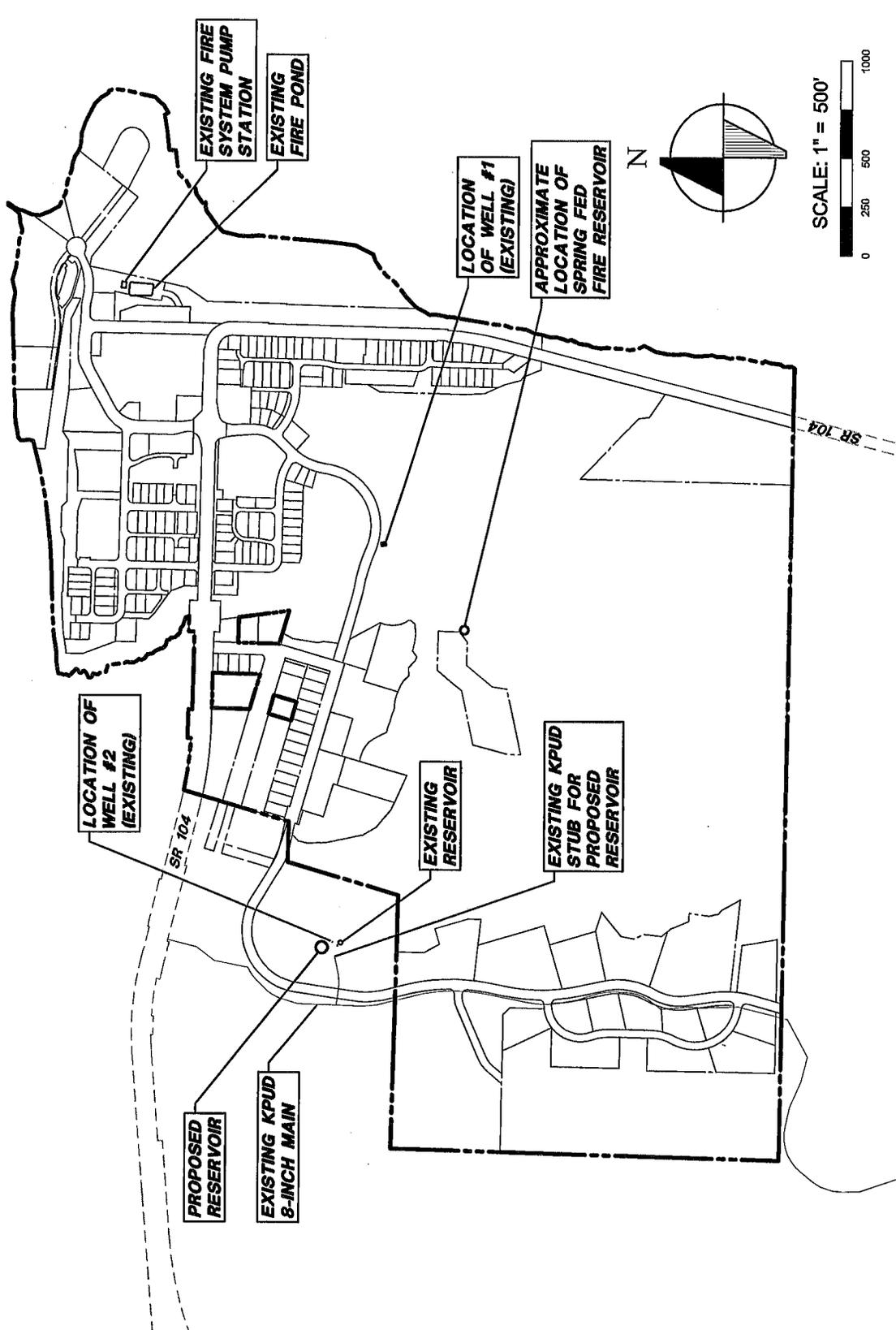
The existing fire system is supplied by surface water from springs located south of town. The water is collected and stored in an approximately 400,000 gallon open reservoir. Water from this reservoir is conveyed to an approximately 500,000 gallon fire pond, located just to the east of the Port Gamble Museum and General Store. Water is pumped through the fire distribution system by a pump station adjacent to the fire pond. The fire distribution system consists of 3 to 6-inch pipes with standpipe connections throughout the town site and fire hydrants on the mill site. Due to the age of the system, it has mostly been closed so that the fire system is currently only used for the sprinkler system in the General Store.

Proposed Water System

With the redevelopment of the Port Gamble site, the existing water system will be replaced with a new system that provides both potable water and fire flow. The existing system will be phased out to provide continued water service and fire protection until the proposed system is constructed. The new distribution system will consist of main lines from 8 to 16-inches. From the connection to the existing KPUD main at the southwest corner of the property to the proposed intersection of Carver Drive and Talbot Street NE, the proposed main will be 16 inches. The loop from this intersection down to the Mill Site, back up along SR 104 and Talbot Street NE is proposed to be 12-inch main. The remaining water mains throughout the site are proposed to be 8-inch.

Storage for fire flow will be provided in a new, 20 foot tall, 364,000 gallon reservoir adjacent to the existing 46,000 gallon reservoir near Well 2, located outside of the historic area. The combined volume of the existing and proposed reservoir (410,000 gallons) will provide storage for a fire flow of 3,000 gallons per minute for 120 minutes.

The project's proposed water system will be phased to meet the domestic and fire flow requirements of the development. The project may be phased in a way that allows the first portion of the site to be developed while utilizing some of the existing infrastructure (for instance, the fire flow pond and pump station). Another possible option for phasing includes phasing of reservoir construction, if it is shown to be a practical development option.



3 SEWER SYSTEM

Existing Sewer System

Under current conditions, Port Gamble is served by a community sewer system, which is owned by Pope Resources. The existing system consists of a collection system, two lift stations, a force main, a membrane bioreactor (MBR) and drainfield, which will soon be transferred to KPUD for operation and maintenance. The capacity of the existing collection system is limited due to infiltration and inflow issues within the existing system. Historic wastewater flows have been recorded at the sewage treatment plant for a number of years. Historic flows have varied greatly primarily influenced by groundwater infiltration into the existing collection system. The recorded historic flows averaged from 8,000 gallons per day to 27,000 gallons per day. The peak flow for the system over the entire recorded period was 81,000 gallons per day. For locations of existing and proposed facilities, see the Sewer Systems Exhibit at the end of this section.

Proposed Sewer System

With the redevelopment of Port Gamble, replacement of the existing sewer collection system is proposed. Replacement of the existing community sewage facilities would be phased to maintain service to the existing system users. The existing collection system will be replaced with a combination of new 8-inch gravity main, 6-inch side sewers and 2 to 4-inch low-pressure sewer lines. Phased construction will replace the existing sewer collection system in order to eliminate infiltration issues in the existing collection systems. The new service system will flow into the new lift station for treatment by the new MBR and discharge to the new drainfield. For the sake of this report, the MBR and drainfield system will be referred to as the LOSS (Large On-site Septic System).

The LOSS System has been permitted to receive a peak flow of 55,800 gallons per day. Using the Washington DOH design flow of 270 gallons per day per ERU, this would allow for the service of 207 ERUs. The 270 gallons per day value is antiquated and new technology advances have greatly reduced actual flows. For example, several local jurisdictions have lower sewer design flows ranging from 150 gallons per day to 200 gallons per day per ERU:

- Karchner Creek Sewer District: 150 gallons per day per ERU
- The City of Port Orchard: 180 gallons per day per ERU
- Olympic Water and Sewer: 185 gallons per day per ERU
- The City of Poulsbo: 197 gallons per day per ERU

In addition, inflow and infiltration (I&I) will be greatly minimized in the proposed sewer plan by the use of low pressure sewer throughout the majority of the project. Where gravity sewer is being proposed, it will be newly constructed and will greatly reduce the I&I compared to the current condition.

The use of water conservation methods such as higher densities, efficient plumbing, etc., along with the minimization of inflow and infiltration, it is likely that the actual sewer flow will be in the range of 150 to 200 gallons per day per ERU. Monitoring will be performed to confirm that actual flows will fall within the 55,800 gallon per day limit. It is proposed that after 150 building permits have been issued, additional building permits will be approved only after confirmation that sufficient capacity is available (based on monitoring actual flows). In addition, the 55,800 gallon per day limit could be increased if additional studies validate drainfield capacity or if expanded facilities are provided in the future under separate approval, if needed.

