CHAPTER 1

WATER SYSTEM DESCRIPTION

INTRODUCTION

In accordance with Washington Administrative Code (WAC) 246-290-100 and the Washington State Department of Health (DOH), water system plans need to be updated every six years or more frequently if necessary to reflect the current conditions of the water system. This Plan has been prepared to update the 1995 City of Sequim (the City) Water System Plan, using the DOH Water System Design Manual, June 1999 and the DOH Water System Planning Handbook, April 1997. Copies of the Washington State Department of Health Project Approval Application and Submittal Forms are included in Appendix A.

SYSTEM OWNERSHIP AND MANAGEMENT

The City of Sequim owns and operates a municipal water system which serves the majority of the incorporated City of Sequim, as well as a portion of unincorporated Clallam County north of the City. The DOH water system identification number for the City is 77620-Y. A copy of the Water Facilities Inventory Report (WFI) is included in Appendix B.

The City of Sequim is governed by a City Manager and a seven member City Council. The City's current mailing address is:

City of Sequim
152 West Cedar Street
Sequim, Washington 98382

Figure 1-1 is a City of Sequim vicinity map.

SYSTEM BACKGROUND

WATER SYSTEM HISTORY

The City of Sequim is located on the Sequim prairie in the northeast portion of Clallam County. The City is situated between the Strait of Juan de Fuca, Sequim Bay, the Dungeness River and the Olympic Mountain Range. Original settlement on the Sequim prairie was by Clallam Indians until in 1853, when the first European, John Donnell, settled on the prairie. During this time, logging, farming, and seafood canning were the main industries of the area. Chronic summer droughts, however, plagued the area

limiting settlement in the area. The first irrigation system was installed in 1885, utilizing the Dungeness River as a resource. With irrigation came the expansion of grain, root, cattle, and dairy farming. The City of Sequim was incorporated in 1913 with a population of 300.

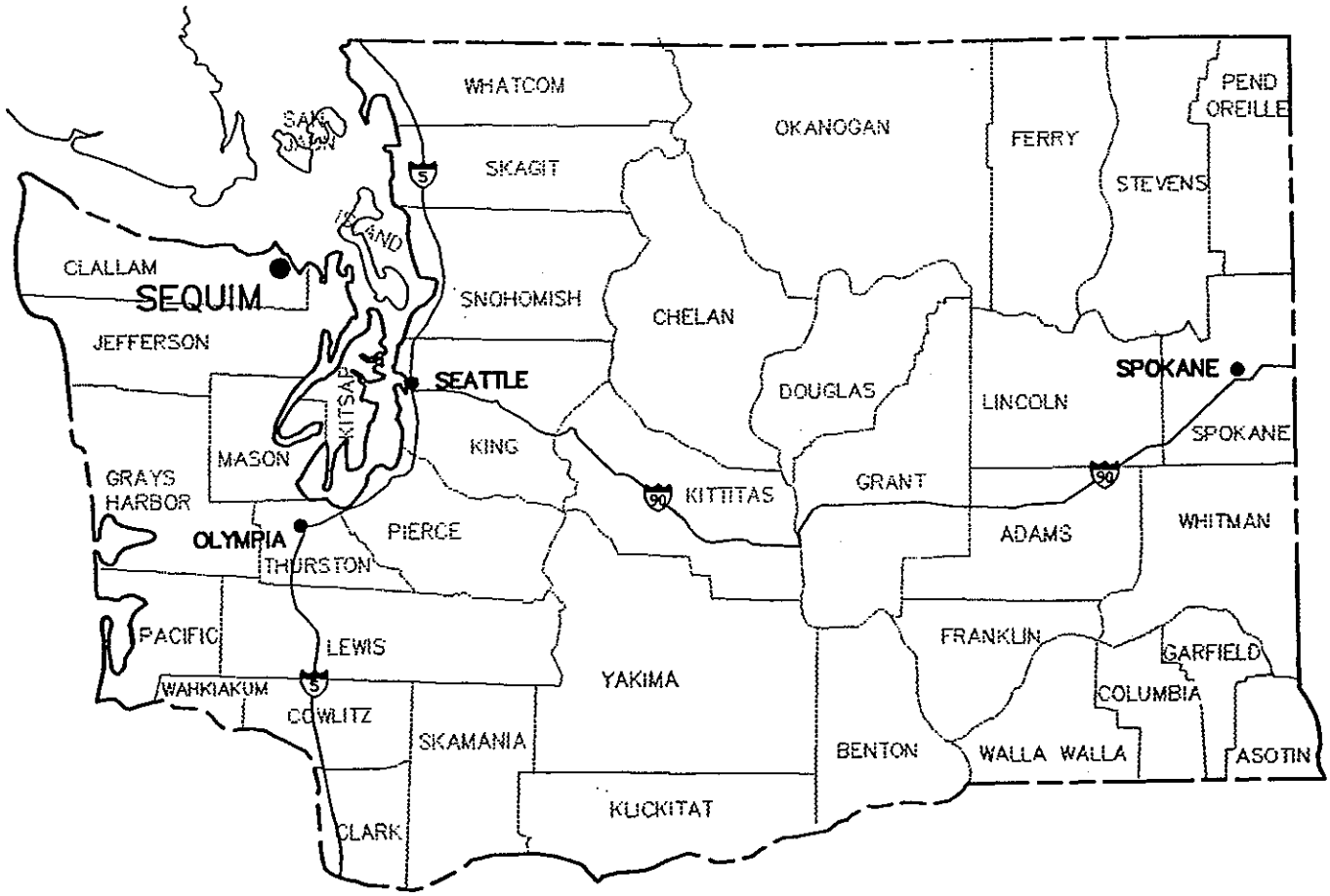
The City's first water system, which served several blocks of central Sequim and was fed by a spring, was purchased from J.L. Keeler in 1922. A bond issue was passed by the City in 1929 to bring water from the Dungeness River and build the first reservoir constructed by the City. A second water transmission main was constructed from the City reservoir in 1948, and in 1953, another bond issue was passed to construct a second reservoir, an intake line from the Dungeness River, and replacement water lines for the original wood stave water pipe.

A study of the City of Sequim's water system was completed in 1973. As a result of this study, additional water system improvements were made to the City's water system. These improvements included covering the City reservoir, metering connections, and replacement of substandard water lines. Another report was completed by 1983, which addressed issues of water quality, water resources, and conservation realized as a result of the installation of City wide water meters. Improvements made to the City's water system which were recommended in this report included covering the 500,000 gallon reservoir, development of the Silberhorn Well Field, installation of chlorination system in the intake piping, and construction of a new infiltration gallery on the Dungeness River. In 1986, a high-pressure zone reservoir was constructed and the Silberhorn Well Field was brought on line. The City's 1.7 million-gallon (MG) reservoir was constructed and the Port Williams Well No. 1 was drilled in 1995. A pressure-reducing valve (PRV) and booster station were constructed at 5th Avenue and McCurdy in 1996. In 1998, additional pipelines and the PRV at 3rd Avenue and McCurdy were constructed and Port Williams Well No. 2 was drilled and equipped. Improvements completed in 1999 include a PRV station on River Road and additional water mains installed as part of the Highway 101 Bypass construction and by developer extensions.

GEOGRAPHY

The Sequim prairie is quite temperate, with an average rainfall over the last five years of approximately 17 inches per year. The prairie, which is in the shadow of the Olympic Mountain Range, gently slopes toward the Strait of Juan de Fuca. Topography within the City ranges from approximately 240 to 140 feet above mean sea level (MSL).

The City of Sequim is located within the Dungeness River, Cassalery Creek, Gierin Creek, Bell Creek and Johnson Creek drainage basins. The Dungeness River is located west of the City and has a basin covering approximately 197 square miles. A series of glacial advances and retreats, interrupted by periods of non-glacial deposition, deposited hydrogeologic units in the greater Sequim area. Groundwater flow within the area's



CITY OF SEQUIM

FIGURE 1–1
VICINITY MAP

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aquifers generally occurs from south to north-northeast, where it discharges into Sequim Bay or the Strait of Juan de Fuca. Virtually the entire Sequim area is designated as a High Aquifer Recharge Area, containing Carlsbor-Puget-Dungeness and Hoypus-Sequim-Agnew soils groups, which are highly permeable.

EXISTING SYSTEM

A description of the facilities currently owned and operated by the City of Sequim is provided in the following sections. Figure 1-2 shows the major water system facilities on a map of the City, and Figure 1-3 is a schematic of water system facilities.

STORAGE

The City of Sequim currently owns and operates three reservoirs: a 0.5 MG concrete reservoir, a 1.7 MG steel reservoir, and a 0.2 MG concrete reservoir. The 0.2-MG, which feeds the high-pressure zone, has an overflow elevation of 481 ft. The 0.5-MG and 1.7 MG reservoirs have overflow elevations of 395 ft. and 420 ft, respectively. These reservoirs supply water to the booster station, which feeds the 0.2-MG reservoir, and also feed the system at a hydraulic grade line (HGL) which varies from 395 ft. to 420 ft. However, there are currently no service connections served at the 395 to 420 ft. HGL. The water from these reservoirs flows through dedicated water lines to three PRVs which serve the 350 zone.

PRESSURE ZONES

The City's water system is divided into two pressure zones to provide adequate service to customers throughout the service area. The upper 480-pressure zone is served by the booster station and 0.2-MG reservoir on Reservoir Road. This upper pressure zone is isolated from other zones by closed gate valves. The lower pressure zone, which currently operates at a hydraulic grade line of 370 feet, is served through three PRVs located at 3rd Avenue and McCurdy St., 5th Avenue and McCurdy Street, and on River Road. The PRVs are set to open in sequence as the downstream pressure in the distribution system drops. Capital improvement project D-2, as recommended in this Water System Plan, will revise the pressure zone boundaries to incorporate the areas with low pressures into the intermediate pressure zone. Following the zone reconfiguration, the City will operate the low-pressure zone at a hydraulic grade line of 350.

Water from the City's 0.5-MG and 1.7 MG reservoirs feeds the three PRVs which deliver water to the lower pressure zone. The City's 0.5-MG and 1.7-MG reservoirs have overflow elevations of 395 ft. and 420 ft., respectively. Currently there are no services supplied directly from these reservoirs; all water from the reservoirs is either pumped to the 0.2 MG Reservoir or fed directly to the PRVs which serve the lower pressure zone.

SUPPLY SOURCES

The City of Sequim currently utilizes three sources of supply: the Infiltration Gallery (River Supply), the Silberhorn Well Field, and the Port Williams Well Field. The City of Sequim's sources are summarized in Table 1-1.

TABLE 1-1

Existing Sources

Source	DOH Source ID No.	Number and/or Type of Source(s)	Installed Capacity (gpm)
Dungeness River	S01	Surface Water	628
Infiltration Gallery	S01	Groundwater Collection System	718
Silberhorn Well Field	S02	Three Groundwater Wells	1,300
Port Williams Well Field	S03	Two Groundwater Wells	1,000[1]

1. Port Williams Wells No. 1 and No. 2 are currently used on an alternating basis, each with a capacity of 500 gpm.

Dungeness River and Infiltration Gallery

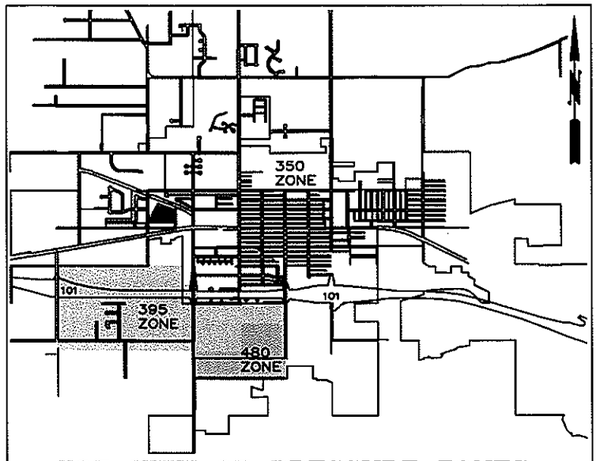
The Infiltration Gallery consists of perforated pipe buried in a gravel filter pack under the stream bank of the Dungeness River. The perforated pipe feeds a central collection well. The Dungeness River recharges the infiltration site at the Infiltration Gallery.

Silberhorn Well Field

The Silberhorn Well Field consists of three wells. Currently, the City only uses two of these three wells and the third is used as a monitoring well. The Silberhorn wells currently used by the City are 40 HP, 460V, 3 phase submersible pumps which were each designed with a pumping capacity of 400 gpm at 306 feet TDH. The City currently operates each of these wells at a maximum pumping rate of 350 gpm. These wells pump to the City's 1.7 MG reservoir and the 395 (420) pressure zone.

Port Williams Well Field

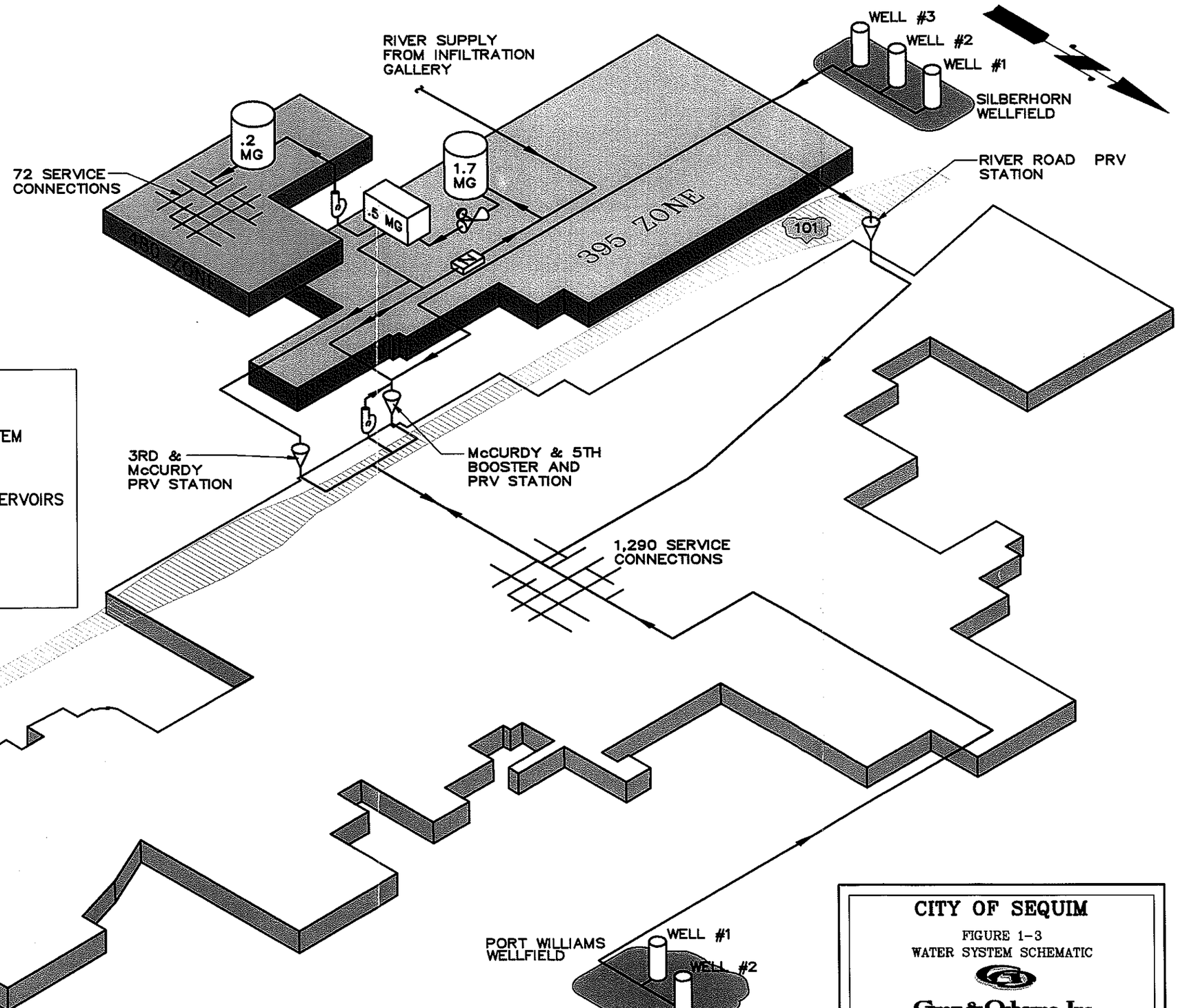
The Port Williams Well Field currently consists of two wells (Wells No. 1 and No. 2). Well No. 1 was drilled in 1995 and Well No. 2 was drilled in 1998. Each well has a 100 HP, 480V, 3 phase submersible pump which was designed with a pumping capacity of 560 gpm at 571 feet TDH. Currently, the City operates the wells on an alternating basis.



TOP VIEW OF PRESSURE ZONES

LEGEND:

- CONNECTION TO DISTRIBUTION SYSTEM
- PRESSURE REDUCING VALVE
- BOOSTER PUMP STAION
- WATER WELL
- ALTITUDE VALVE
- RESERVOIRS (1.7 MG, .5 MG)



NOTE:

THE HGL IN THE 395 ZONE VARIES BETWEEN 420, WHEN THE RESERVOIR IS BEING FILLED, AND 395, WHEN THE RESERVOIRS ARE SUPPLYING FLOW TO THE SYSTEM.

CITY OF SEQUIM

FIGURE 1-3
WATER SYSTEM SCHEMATIC

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