

SCATCHET HEAD WATER DISTRICT WATER SYSTEM PLAN

PWS ID # 76470 X
Clinton, WA 98236

April 2, 2020

Owner:
Scatchet Head Water
District
7906 Guemes Avenue
Clinton, WA 98236

System Contact:
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CERTIFICATE OF ENGINEER
Water System Plan for Scatchet Head Water District

The technical material and data contained within this report has been prepared by or under the direction of the following registered professional engineer(s), licensed in accordance with the laws of the State of Washington to practice in the State of Washington.



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QUICK REFERENCE PROJECT INFORMATION

General Project Information

Water System Name	Scatchet Head Water District
System ID #	76470 X
Project Description	Water System Plan (WSP) Update per Washington State Department of Health (WSDOH) Water System Planning Handbook and Pre-Plan Conference

WSP and System Information

Service Area and Current & Allowable Connections	Service area = approx. 220 acres Current connections = 410 connections DOH Approved Capacity = 451 Connections
System Source	Well #1 – Abandoned Well #2 – 125 gpm capacity Well #3 – 66 gpm capacity
System Treatment	Chlorination & Filtration
System Storage	#1 – 300,000-gallon Guemes Avenue Reservoir: 24.0’ diameter x 85’ tall #2 – 120,000-gallon Maple Point Drive Reservoir: 14.6’ diameter x 95.0’ tall
System Distribution	Over 36,000 feet or about 6.8 miles. Approximately 6600’ of 2” & 2.5” pipe of various materials, approx. 9800’ of 6” asbestos cement pipe
Water Rights	G1-23621C: S02, Priority Date: June 11, 1980 Qi = 125 gpm & Qa = 140.4 Ac-Ft/year G11-20574P: S03, Priority Date: April 29, 1973 Qi = 90 gpm & Qa = 101 Ac-Ft/year Total: Qi = 215 gpm & Qa = 241.4 Ac-Ft/year
Booster Pump Capacity	(4) Aurora Series 340 / 360, 7.5 HP, 3500 RPM – 200 gpm at 45 psi (260 gpm at 30 psi)
Calculated Day Demands	Average Day Demand (ADD) = 200 gpd/ERU Maximum Day Demand (MDD) = 425 gpd/ERU
Peak Hour Demand	Zone 1 (Low): 150 HGL ~ 60 ERUs Zone 2 (Intermediate): 285 HGL ~ 79 ERUs Zone 3 (High): 445 HGL ~ 353 ERUs
System Capacity Based on Source	ADD = 1,077 ERUs (Qa = 241 ac-ft/yr and 200 gpd/ERU) MDD = 597 ERUs (191 gpm well production, 425 gpd/ERU)
System Capacity Water Rights Based	ADD = 1077 ERUs (241 ac-ft/year) MDD = 672 ERUs (215 gpm)
Storage Needs Based on System Capacity	Operational Storage = 3,384 gallons Equalizing Storage = 26,298 gallons Standby Storage = 249,487 gallons Dead Storage = 8,460 gallons
Existing System Available Capacity	597 ERUs (based on source capacity of 191 gpm and MDD of 425 gpd/ERU) 41 ERUs (451 approval ERUs minus 410 existing ERUs)
System Improvements	See Chapter 8

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Table 1 Abbreviations

AC	Asbestos Cement
AF	Auditor’s File
ADD	Average Day Demand
APWA	American Public Works Association
AWWA	American Water Works Association
BMPs	Best Management Practices
CCC	Cross-Connection Control
CIP	Capital Improvement Plan
CWSP	Coordinated Water System Plan
CWSSA	Critical Water Supply Service Area
DOH	Washington State Department of Health
DOE	Washington State Department of Ecology
DS	Dead Storage
DSL	Distribution System Leakage
ERU	Equivalent Residential Unit
ES	Equalizing Storage
FSS	Fire Suppression Storage
gpm	Gallons Per Minute
GMA	Growth Management Act
GWI	Ground Water Under the Influence of Surface Water
ID	Identification
LID	Local Improvement District
MCL	Maximum Contaminant Level
MDD	Maximum Day Demand
MMAD	Maximum Month Average Day Demand
mg/L	Milligram per liter
No.	Number
OS	Operational Storage
PE	Professional Engineer
PHD	Peak Hour Demand
ppb	Part Per Billion
psi	Pounds Per Square Inch
PVC	Polyvinyl Chloride
OFM	State Office of Financial Management
RCW	Revised Code of Washington
SAL	State Advisory Level
SBS	Standby Storage
SDWA	Safe Drinking Water Act
SHWD	Scatchet Head Water District
SOC	Synthetic Organic Chemical
SWI	Seawater Intrusion
VOC	Volatile Organic Chemical
WAC	Washington Administrative Code
WFI	Water Facilities Inventory
WHPA	Wellhead Protection Area
WRIA	Water Resources Inventory Area
WSP	Water System Plan
WUE	Water Use Efficiency

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1 DESCRIPTION OF WATER SYSTEM

This chapter addresses the Scatchet Head Water District's (SHWD) Water System (hereafter "Water System" or "District") ownership and management, system history and background, inventory of existing facilities, related plans, information and dated maps, policies, duty to serve, and consistency from local planning.

1.1 Ownership and Management

The following sections summarize the water system name and ID number, type of ownership, management structure, certified operator, engineer, and WFI.

1.1.1 Water System Name and ID Number

Water System Name: Scatchet Head Water District
Water System ID No: 76470 X
UBI Number: 601-141-340

1.1.2 Type of Ownership and Management

SHWD is a municipal corporation as set forth in the Revised Code of Washington (RCW) Title 57 and authorized by the Island County ordinances. The District is subject to Federal, State and Local regulations. Three local citizens are elected to the Board of Commissioners by voters living within the boundaries of the district.

1.1.3 Management Structure

The District's current Board of Commissioners are:

Dave Mullins
Scott Carr
Jaquelin Guyette

1.1.4 Water System Operations

Daily operations and compliance are the responsibility of King Water Company, a Satellite Management Agency hired by SHWD. King Water Company also handles the meter reading, billing and general accounting for the water system. Contact information for King Water Company is provided below:

King Water Company
SMA Number: 128
107 South Main Street
Coupeville, WA 98239
PHONE: (360) 678-5336
E-MAIL: sandra@kingwater.com

1.1.5 Certified Operator

Operator	Position	Classification
Sandra Bodamer	Owner	WDM 2, WTPO 2, CCS
Jason Terpening	Operations Manager	WDM 2, WTPO 2
Nathan Driscoll	Technician	WDM 2, WTPO 1
Nick Fuller	Technician	WDM 1, WTPO 1
Jeremy Lagassee	Technician	WDM 1

1.1.6 Engineer

Water system engineer of record:

DCG, Inc.
Robert Bennion, P.E., Civil Engineer
Additional Principals: Jeff Tasoff, P.E. and Quin Clements, P.E.
P.O. Box 1132
Freeland, WA 98249
Phone: (360) 331-4131 x206
Email: robert@dcgengr.com or jeff@dcgengr.com

The Water System's engineer performs the following services:

1. Identifying source, storage, or water distribution system needs and improvements;
2. Analyzing alternate solutions to the needs and improvements;
3. Assuring that the system designed will function properly and be efficient and economical;
4. Preparing detailed construction documents to implement the selected solution to the needs;
5. Assisting in obtaining plan approval and obtaining bids from contractors to perform the work;
6. Inspecting and testing the quality of the contractor's work and making necessary reports and recommendations to the water system; and
7. Completing Department of Health (DOH) certification documents to the extent that the engineer has direct knowledge of the as-built facilities.

1.1.7 Water System Financial Accounting

King Water Management Services (King Water) provides the Water System's billing services and maintains customer records, including water usage. King Water also maintains the system's financial records, provide future budgetary needs, and propose changes to the water rate structure.

1.1.8 Water Facility Inventory Form

A copy of the current Water Facilities Inventory For (WFI) is attached in APPENDIX E.

1.2 System History and Background

The following subsections provide a brief history of the Scatchet Head Water District.

1.2.1 History of Water System Development and Growth

Scatchet Head Water District is located at the south end of Whidbey Island between Useless Bay and Cultus Bay. The District provides water for the Plat of Scatchet Head (1965) and Cottage Glenn PRD (1996). Construction for the water system began in 1958.

Well no. 1 was the first well to supply the system and was located on Driftwood Drive (Lot 22 of Block 15). This well was abandoned in 1996 due to poor water quality. The well casing has been cut off below grade and filled in accordance with the criteria outlined by the Washington Department of Ecology.

Well no. 2 was first installed in 1980 and is located southwest of the intersection of George Drive and Samish Court. With the poor water quality from the original well on Driftwood Drive, well no. 3 was installed in 1995 on the same parcel as well no 2. In 1997, a reservoir at Maple Point for storage and a new distribution lines were added to serve 26 new lots.

With the installation of Well no. 3, the District undertook a significant upgrade to the distribution system in 1999. The upgrades consisted of the installation of a dedicated transmission main from Wells

no. 2 and 3 to the reservoir located on Guemes Avenue along with associated electrical and control elements. At the same time a building was constructed on the Guemes Avenue reservoir parcel to provide water treatment, booster pumps, and other associated appurtenances to monitor and control the distribution system. The new booster pumps allowed the reservoir to provide additional useful storage to the system and increased operating pressures. With this increase in operating pressure to replacement pressure reducing valves were installed which allowed for the removal of two old storage tanks to be abandoned.

The District current has 410 connections to its water system. The number of DOH approved connections is 451 connections. There are currently no pending requests for connections or annexations to serve property outside of the service area.

1.2.2 Geography

The water system is located on the southern end of Whidbey Island in Island County. It is approximately 5 miles southwest of Clinton along the western shore of Cultus Bay as shown on the service area map in APPENDIX C. The shoreline creates a natural boundary for the southeast portion of the service area. The topography within the District slopes down toward sea level at Cultus Bay on the south and southeast. The District's northern boundary is Swede Hill Road which has an approximate elevation of 325-feet above sea level. The elevation rises gradually to the south for approximately 1,200-feet to an elevation of 350-feet. From that point the topography slopes down at varying degrees to sea-level along Driftwood Drive which is located along the coast of Cultus Bay. The rolling topography of the area was molded by glacial action and much of the present soil originated from glacial drift deposits left by the receding glaciers that once blanketed the Puget Sound area.

1.2.3 Climate

The south end of Whidbey Island has cool, dry summers and mild cloudy and rainy winters. Severe winter storms generally are prevented from moving into the area by the Olympic Mountains. There is a prevailing wind from the north in Saratoga Passage and on Holmes Harbor on most afternoons in the summer.

The annual average temperature for the Clinton area is 51.4 degrees Fahrenheit, and the climate ranges between an average January temperature of 38.2 degrees Fahrenheit and an average July temperature of 62.7 degrees Fahrenheit. The average annual rainfall is 25.70 inches, based on readings at Everett and Anacortes Weather Stations by the National Weather Service.

1.2.4 Neighboring/Adjacent Purveyors

There are no other large water purveyors within the District; there are only a few small systems and many private wells on larger parcels.

Known Group B located in the general vicinity of the District include:

- Southview Water System
- Sweetwater Creek Farms Water System.

1.2.5 Ordinances/Bylaws

The District's Ordinances/Bylaws affecting the design standards and fire flow requirements are discussed in Section 3.1.

1.3 Inventory of Existing Facilities

The District’s existing facilities are shown in Figure 1-1 and discussed in detail in Chapter 3. In general, the District has three groundwater wells, two of which are providing the source, two steel reservoirs (120,000-gallons and 300,000-gallons) for storage, a booster pump station, and approximately 36,000 linear feet of water mains ranging from 2-inches to 8-inches with a mixture of ductile iron, PVC, and asbestos-concrete (AC) and Ductile Iron pipe. The water mains for the intertie are primarily PVC C900. There are no existing interties with other water systems.

Table 1-1 Inventory of Existing Facilities

Component	Description
Source	S01- Well #1 - Abandoned S02- Well #2: 1980 – 10” casing – 295’ deep Screened Interval 231-234’ Static Water Level – 190’ S03- Well #3: 1995 – 8” casing – 403’ deep Screened Interval 242-246’ Static Water Level – not recorded
Submersible Pumps	S02- Well #2 - 125 gpm, 30 HP pump, Goulds Model 160CLC030, 12 stage, 3450 rpm, 480/277 VAC, three phase S03- Well #3 - 66 gpm, Goulds Model 70J15, 15 HP, 13 stages, 3450 rpm, 480/277 VAC, three phase
Reservoirs	#1 – 300,000 gallon Guemes Avenue Reservoir: 24.0’ diameter x 85’ tall #2 – 120,000 gallon Maple Point Drive Reservoir: 14.6’ diameter x 95.0’ tall
Booster Pump Station	(4) Aurora Series 340 / 360, 7.5 HP, 3500 RPM – 200 gpm at 45 psi (260 gpm at 30 psi) Horizontal Pneumatic Tank - 2,120 gallon Canal Boiler Works 66” diameter x 10’ horizontal
Structures	1,125 SF Pumphouse
Chemical Injection Systems	Hypochlorinator – Pre and Post Treatment LMI Series A17 Pump: 2.0 GPH, 50 psi
Filtration	Iron and Manganese Reduction System (4) 48” Diameter, 463 Gallon Filter Tanks
Distribution System	2” & 2.5” (various materials) – 6,636’ 4” (polyvinyl chloride, PVC) – 8,695’ 6” (asbestos cement, AC) – 9,755’ 6” (ductile iron, DI) – 940’ 6” (PVC, class 150) – 1,313’ 6” (C-900 PVC, class 150) – 11,034’ 8” (ductile iron, DI) – 312’ 8” (C-900 PVC, class 150) – 567’

1.4 Related Plans

This plan is consistent with the following related plans:

- Island County Comprehensive Plan
- Island County Comprehensive Water and Sewer Plan - 1968
- Island County Water Pollution Control and Abatement Plan - 1972
- Island County Water Quality Management Plan (section 303 (e) (PL 92-500) -1974
- Island County Coordinated Water System Plan (CWSP)
- Island County Groundwater Management Plan

1.5 Existing Service Area Characteristics

Descriptions of the District's service area characteristics and existing zoning/land use are discussed in the following sections.

1.5.1 Description of Service Area

The District's service area is shown on the map in Figure 1-1 below and in APPENDIX C with as-built drawings for the distribution system in APPENDIX B. There is currently a total of approximately 492 lots within the service area. The service area complies with the service area agreement recorded with Island County attached in APPENDIX A.

Figure 1-1 Scatchet Head Service Area



1.5.2 Existing Zoning and Land Use

The District serves the Plat of Scatchet Head and the Cottage Glenn PRD located at the south end of Whidbey Island between Useless Bay and Cultus Bay. The area served is located in unincorporated Island County. The existing service area currently is approximately 220 acres zoned "Rural" (R) by Island County. Rural zones are defined by Island County Code Section 17.03.060.

1.6 Service Area Agreements

The District has an approved Service Area Agreement on file with the Island County health Department. A copy is included in APPENDIX A. Any service area changes will comply with the Island County Coordinated Water System Plan and WSDOH requirements.

1.7 Service Area Policies

The District's service area policies are attached in APPENDIX A. The District provides service to property owners within its service area based on the system's capacity and ability to do so. Actual commitment to serve is made only upon official "application for service" and upon payment of then applicable fees and charges and based upon system capacity at that time. Any main extensions necessary to provide service are the responsibility of the developer as required in the Developer Extension agreement.

Conditions of technical and non-technical nature (e.g., annexation procedures, water right issues, local ordinances, etc.) that may affect the District's ability to provide new water service were considered in determining the system capacity (see Section 3.3.6) which is a factor in the District's new service requests.

1.8 Satellite Management Agencies

The District does not intent to become a Satellite Management Agency (SMA), however, the District's Certified Operator is also a state Certified Satellite Management Agent.

1.9 Conditions of Service

The State Municipal Water Law (RCW 43.20.260) provides water service conditions to be followed by water utilities of the State. Under this law, a municipal water supplier has "a duty to provide retail water service within its retail service area." The Scatchet Head Water District will provide water service to all the properties within its current retail service area. Conditions of service are detailed in the Application for Water Service documents provided by the Water District to potential and current customers.

The District is committed to providing retail water service to all property within its retail service area in a timely and reasonable manner, consistent with applicable District resolutions and policies, the Municipal Water Law, Washington State Department of Health rules and regulations and other applicable federal, state and local laws. Pursuant to RCW 43.20.260, as a municipal water supplier as defined in RCW 90.03.015, the SHWD has a duty to provide retail water service within its retail water service area if:

- District water service can be available in a timely and reasonable manner.
- The District has sufficient water rights and other sources of supply to provide the service;
- The District has sufficient capacity to serve the water in a safe and reliable manner as determined by DOH; and
- It is consistent with the requirements of applicable comprehensive plans or development regulations adopted under Chapter 36.70A RCW (GMA) or any other applicable comprehensive

plan, land use plan, or development regulation adopted by a city, town, or county for the service area.

1.10 Consistency from Local Planning

Concurrent with the state submittal the Water System Plan will be coordinated with Island County to ensure consistency with the Island County Comprehensive Plan.

1.11 Complaints

Complaints are promptly referred to the District's SMA, King Water Management Services (King Water). A log of complaints is kept by King Water. If necessary, staff will be dispatched to investigate the complaint.

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2 BASIC PLANNING DATA AND WATER DEMAND FORECASTING

Current and projected planning data/parameters are discussed in this Chapter. There are currently 410 active connection on the Scatchet Head Water District's distribution system with the system currently limited to 451 service connections. The SHWD provides service mostly to single-family residential customers, therefore this report will use the terms service connection and ERU interchangeably.

This report looks at three planning periods or phases. Phase 1 is the six-year planning window from 2019 to 2025. Phase 2 is for the extended planning period of 2025 to 2039. Phase 3 covers the long-term planning from the year 2039 and beyond. This chapter and the next will provide data to support an increase to the number of service connections that can be supported by the SHWD.

2.1 Current Water Use

The District's current population, service connections, water use, and Equivalent Residential Units (ERUs) are discussed in the following sections.

2.1.1 Current Population

The present population of the communities served by the District is estimated at approximately 900 full time residents. These numbers are based on the current Water Facility Inventory (WFI) which was last updated in December of 2018. A copy of the WFI is included in APPENDIX E. Given an active number of full-time residential service connections of 409, the average population served per connection is approximately 2.2 people.

2.1.2 Current Service Connections

The District has DOH approval for 451 connection but the updated capacity analysis for the distribution system shows that the system capacity is actually capable of serving 559 connections total. This shows that the District has capacity to serve all potential connections within its water service boundary with some additional connections available. Currently SHWD serves a total of 410 connections, the majority of which are residential connections. The only commercial connection on the distribution system is the clubhouse and swimming pool located on Driftwood Drive. It is anticipated that any expansion of the District's service area will be for serving neighboring residential customers, allowing the character of the District to remain primarily residential.

2.1.3 Water Usage History

Water usage from the last seven years was analyzed to determine current design values for the system. The water use data for these periods is provided in APPENDIX L. The following sections summarize the production, water loss, ADD, ERUs, MDD, and PHD calculations.

2.1.3.1 Water Production

Historical water consumption has been summarized in Table 2-1. The water usage has been increasing at a rate of about 500,000-gallons per year or 15%. Monthly water usage per ERU for the years 2011-2017 can be found in APPENDIX L. The most seasonal demand occurs during the summer. Variations in consumption rates reflect change in weather conditions, community activities, and habits of the population. Additionally, we know that a fire will demand a large quantity of water in excess of the normal demand for that service line. Knowledge of the extent and timing of these variations from the average is necessary to the planning of the water system supply.

In general, the district water usage has remained flat but has been slightly increasing in recent years. This trend likely due to the increase in the number of connections and water leaks due to aging infrastructure.

2.1.3.2 Water Loss

Water loss has been on the decline until recently. Aging infrastructure is proposed to be replaced and may reduce the amount of water loss. If the 3-year average rises above 10%, then it is recommended that the district investigate possible leaks in the distribution lines and metered connections.

Table 2-1 Historical Water Consumption and Loss

Year	Water Production (gallons)	Water Loss (%)	ADD (gpd/ERU)	Summer ADD (gpd/ERU)	MMAD (gpd/ERU)	MDD (gpd/ERU)	Total Usage (ac-ft/yr)
2011	15,712,712	15.5	105	129	150	254	48
2012	15,094,191	10.4	101	118	139	237	46
2013	16,076,465	6.0	107	130	163	277	49
2014	16,437,749	8.7	110	138	169	287	50
2015	18,055,748	7.6	121	156	182	309	55
2016	18,976,236	13.7	127	153	181	307	58
2017	20,367,292	12.1	144	191	223	380	62.5
2018	21,882,590	15.0	n/a	n/a	n/a	n/a	67.2
Design			120	200			

2.1.3.3 Equivalent Residential Units (ERUs)

The SHWD service area is composed almost exclusively of residential connections, except as noted above. Table 2-2 summarizes the various connections to the distribution system. Therefore, a connection and an ERU are essentially identical for this system. The terms ERUs and service connections will be used interchangeably in this report.

Table 2-2 Existing Connection Consumption

Connection Type	Connections
Single-Family Residences	409
Inactive Connections	0
Non-Residential	1
Total	410

2.1.3.4 Average Day Demand (ADD)

The average day demand (ADD) is defined as the total volume of water produced in one year divided by the number of days in the year and the of Equivalent Residential Units. Using water production data rather than consumption data gives an indication of the actual water required by the District, which includes distribution system leakage. Water production from the last seven years was analyzed to determine current design values for the system. The water use data for these periods is provided in APPENDIX L. The annual average day demand (ADD) water usage was 120 gpd/ERU for this period. The summer (June-September) ADD value for the last 3 years is approximately 200 gpd/ERU. For a conservative analysis the summer ADD will be used as the system ADD.

2.1.4 Maximum Day Demand

The maximum day demand (MDD) is typically determined by source meter readings and is the largest single-day usage of water. The maximum day demand (MDD) could not be determined from actual water use data due to lack of daily source meter readings. Therefore, a multiplier of 1.7 is used to estimate MDD from maximum monthly average day demand (MADD). The design MADD is 250 gpd/ERU which equates to MDD value of 425 gpd/ERU.

2.1.5 Peak Hour Demand

Peak Hour Demand (PHD), used in conjunction with fire flow requirements for distribution/transmission main limitations, was calculated in accordance with Section 5.2.2 of the DOH Water System Design Manual (Design Manual). Equation 2-1 uses the MDD and the number of potential connections to determine the PHD flowrate.

Equation 2-1

$$PHD = \frac{MDD}{1440} [(C)(N) + F] + 18$$

PHD = Peak Hourly Demand (gallons per minute)

N = number of potential connections

C = coefficient based on system size

F = coefficient based on system size

MDD = 425 gpd/ERU

The coefficients that are utilized in the above formula are dependent upon the number of connections served. The coefficients are listed in the Table 2-3.

Table 2-3 Peak Hour Demand (PHD) Equation Coefficients

Range of ERUs	C	F
15-50	3.0	0
51-100	2.5	25
101-250	2.0	75
251-500	1.8	125
501-1,000,000	1.6	225

The design MDD of 425 gpd/ERU, Equation 2-1 and the values provided in Table 2-3 were used to calculate the PHD for 2019, 2025, 2039 and the maximum system physical capacity of 559 ERUs. The calculated PHD values are summarized in Table 2-4.

Table 2-4 Peak Hour Demand (PHD) Based on MDD

Year	N (ERUs)	MDD (gpd/ERU)	Coefficient Associated with Range of ERUs	Factor Associated with Range of ERUs	PHD (gpm)
2019	410	425	1.8	125	273
2025	430	425	1.8	125	294
2039	455	425	1.8	125	297
Max	559	425	1.6	225	349

As shown in Table 2-4, the current PHD is 273 gpm. The PHD calculations assume the maximum possible ERUs based on the projected future system and the maximum possible number of connections purported by this Water System Plan. The district will use a PHD of 273 gpm until review of future consumption data proves otherwise.

2.2 Projected Land Use, Future Population, and Demand Forecasting

This District’s projected land use, future population, and water demand are discussed in the following sections.

2.2.1 Projected Land Use

As discussed in Section 1, the Scatchet Head Water District currently provides water for the Plat of Scatchet Head, Cottage Glenn PRD. A vicinity map showing the location of the District is shown in Figure 1-1.

The area currently served, or capable of being served, by the District has a total approximate area of 220 acres. All of the area currently served by the District is zoned as Rural according to the Island County zoning maps.

SHWD plans for present and future fire flow capabilities throughout the distribution system for all water mains constructed in the Public Rights-Of-Way. Site specific fire flow requirements for individual development projects are determined by Island County through its development review processes. The potential for any major business or larger multifamily structures being located within the water system area are slim due to the limited capacity of the land to host septic system drain fields of any substantial scale. There is a potential for Rural Cluster Developments within the service area.

2.2.2 Projected Connections

There is not extensive data on past connection numbers, so for this projection the number of lots and prior inquiries on joining the water system was used. The projected number of ERUs served at the end of Phase 1 is 430. Projected growth during Phase 2 will require service to an estimated 455 ERUs at the end of year 2039. Phase 3 planning looks beyond the 20-year window to determine what strategic planning may be necessary to safeguard the distribution system into the future. Total build-out within the SHWD water service area is difficult to estimate because of on-site septic limitations reduce the number of buildable homesites. In addition, there are multiple properties that own neighboring lots to effectively increase the size of their property.

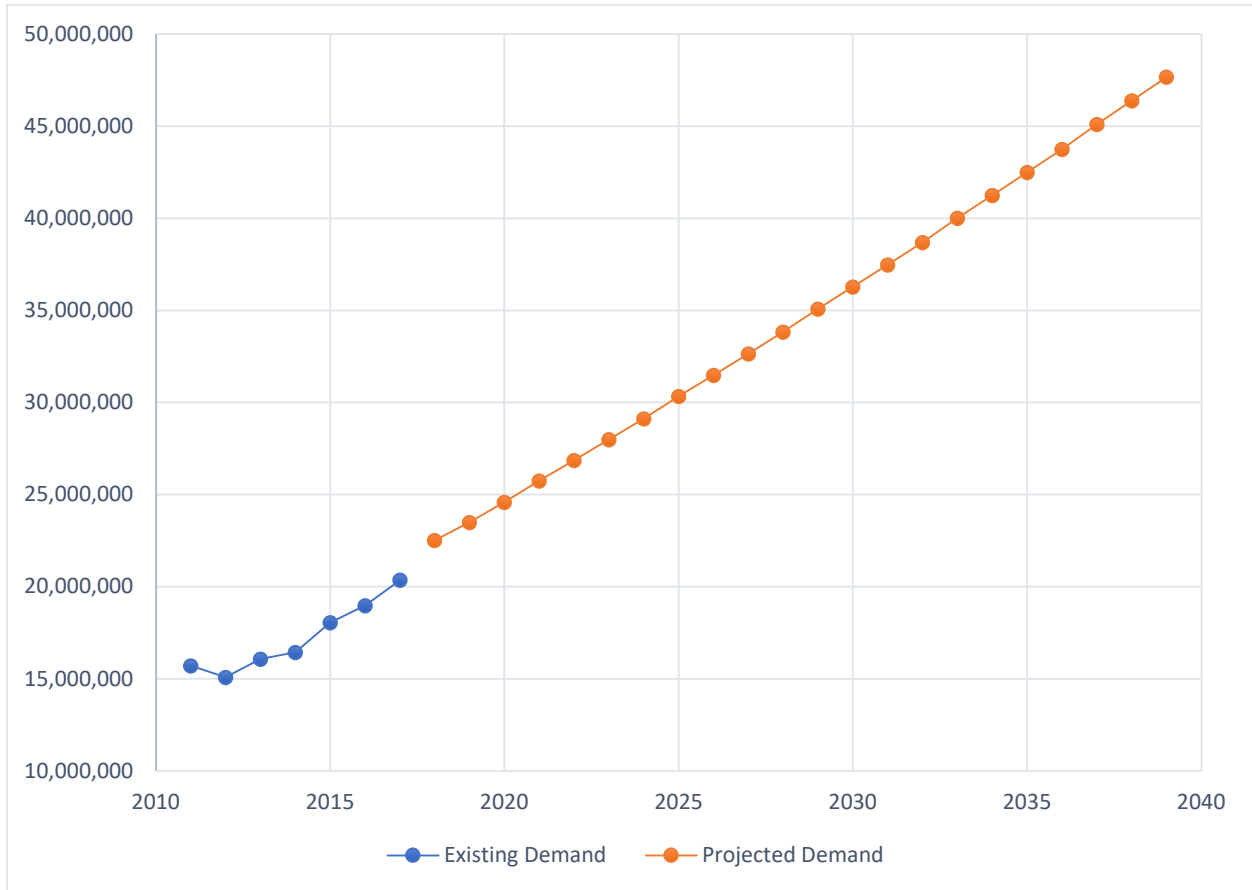
2.2.3 Projected Demand

The projections are based on the increase in the proposed ERUs and trends in Annual Production and the ADD. The project demand is summarized in Table 2-5 below. The 2039 projected annual production is below the current total water right of 241.4 Ac-Ft/year.

Table 2-5 Projected Annual Demand Based on ADD

Year	N (ERUs)	ADD (gpd/ERU)	Annual Production (gallons)	Annual Production (ac-ft)
2019	410	151	23,495,050	69.1
2025	424	196	30,332,960	93.1
2039	455	287	47,633,525	146.3

Figure 2-1 Scatchet Head Demand Projection Chart



3 SYSTEM ANALYSIS

This chapter summarizes the analysis of the existing system to determine if the system facilities are capable of supplying sufficient quality and quantity of water to meet existing and projected demands as identified in Chapter 2. Improvements to the system to meet projected demands are discussed in the final section of this chapter.

3.1 System Design Standards

The Water System's Technical Specifications, provided in APPENDIX N, were developed to be in compliance with the following codes and standards:

- Water system construction work shall be performed in accordance with the all applicable State and County codes and with the "Standard Specifications for Municipal Public Works Construction", as prepared by the Washington State Chapter of the American Public Works Association, current edition or as otherwise revised or superseded, and with the "Standard Specifications for Water Main Installation" of the Scatchet Head Water District;
- Design, construction, maintenance and operation shall be in accordance with the requirements of WAC 246-290, "Rules and Regulations of the State Board of Health regarding Public Water Supplies", as now existing or hereafter amended, and also with Section Chapter 13.03A of the Island County Code, as now existing or hereafter amended.

3.1.1 Water Quality Parameters

Groundwater wells provide the source water for the Water System and therefore the Water System is required to comply with the water quality requirements specified in WAC 246-290 Part 4 – Water Quality which includes requirements from the Code of Federal Regulations (CFR) Title 40.

It is required that purveyors of community water systems shall have one complete analysis from each water source every thirty-six months. A selection of recent water quality test results are included in APPENDIX S and additional information is available on the DOH Sentry Internet website:

<https://fortress.wa.gov/doh/eh/portal/odw/si/Intro.aspx>

The water quality monitoring locations and schedule, as specified in WAC 246-290 and 40 CFR, is summarized in Table 3-1.

Table 3-1 Water Quality Monitoring Schedule

Constituent	Sample Location	Schedule/Frequency
Asbestos	One sample from distribution system or if required by department, from the source.	One sample every 9 years.
Bacteriological	From representative points throughout distribution system.	Once a month
Complete Inorganic Chemical & Physical	From a point representative of the source, after treatment, and prior to entry to the distribution system.	One sample every 3 years.
Lead/Copper	From the distribution system at targeted sample tap locations.	As directed by WSDOH.
Nitrate/Nitrite	From a point representative of the source, after treatment, and prior to entry to the distribution system.	One sample annually.
Potential Trihalomethanes – Ground Water	From two representative points in the distribution system.	Two samples every 3 years.
Radionuclides	From the source.	One sample every 3 years.
Organic Chemicals (VOCs)	From a point representative of the source, after treatment and prior to entry to distribution system.	One sample every 3 years.
Organic Chemicals (SOCs not included those listed below)	From a point representative of the source, after treatment and prior to entry to distribution system.	One sample every 3 years.
Organic Chemicals (SOCs including EDB and other soil contaminants, Dioxin, Endothall, Diquat, Glyphosphate)	From a point representative of the source, after treatment and prior to entry to distribution system.	State Waiver Through 2019

3.1.1.1 Bacteriological Testing

The State requires that systems serving up to a population of 1,000 people have a minimum of one routine bacteriological analysis per month. The sample is to be taken from the distribution system. When any samples with a coliform presence are collected during the previous month, the purveyor must take 5 repeat samples. If those samples do not contain any presence of coliform bacteria, the sampling may revert to the statutory number of samples per month. If coliform bacterial is detected, four follow-up samples are required the same month, then five routine samples the following month if the four follow-up tests are negative; otherwise WSDOH will specify follow-up requirements. The Coliform Monitoring Plan provided in APPENDIX R, provides the sampling points that will be used within the system.

3.1.1.2 Inorganic Chemical Testing

WAC 246-290 and CFR 40 specify testing for primary and secondary inorganic chemicals. The maximum contaminant levels (MCLs) for inorganic chemicals are summarized in Table 3-2.

Table 3-2 Inorganic Chemical Maximum Contaminant Levels (MCLs)

PRIMARY INORGANIC CHEMICALS		SECONDARY INORGANIC CHEMICALS	
Substance	MCLs (mg/L)	Substance	MCLs (mg/L)
Antimony (Sb)	0.006	Chloride (Cl)	250.0
Arsenic (As)	0.010	Fluoride (F)	2.0
Asbestos	7 million fibers/liter (longer than 10 microns)	Iron (Fe)	0.3
Barium (Ba)	2.0	Manganese (Mn)	0.05
Beryllium (Be)	0.004	Silver (Ag)	0.1
Cadmium (Cd)	0.005	Sulfate (SO ₄)	250.0
Chromium (Cr)	0.1	Zinc (Zn)	5.0
Copper (Cu)	*		
Cyanide (HCN)	0.2		
Fluoride (F)	4.0		
Lead (Pb)	*		
Mercury (Hg)	0.002		
Nickel (Ni)	0.1		
Nitrate (as N)	10.0		
Nitrite (as N)	1.0		
Selenium (Se)	0.05		
Sodium (Na)	*		
Thallium (Tl)	0.002		

*Although the state board of health has not established MCLs for copper, lead, and sodium, there is sufficient public health significance connected with copper, lead, and sodium levels to require inclusion in inorganic chemical and physical source monitoring. For lead and copper, the EPA has established distribution system related levels at which a system is required to consider corrosion control. These levels, called "action levels," are 0.015 mg/L for lead and 1.3 mg/L for copper and are applied to the highest concentration in ten percent of all samples collected from the distribution system. The EPA has also established a recommended level of 20 mg/L for sodium as a level of concern for those consumers that may be restricted for daily sodium intake in their diets.

3.1.1.3 Physical Characteristics

WAC 246-290 and CFR 40 specify testing physical characteristics. The MCLs for physical characteristics are summarized in TABLE 3-3.

Table 3-3 Physical Characteristics

Substance	Secondary MCLs
Color	15 Color Units
Specific Conductivity	700 umhos/cm
Total Dissolved Solids (TDS)	500 mg/L

The generally accepted classification of hardness is summarized in TABLE 3-4.

Table 3-4 Relative Hardness

Description	Concentration of CaCO ₃
Soft	0-60 mg/l
Moderately hard	61-120 mg/l
Hard	121-180 mg/l
Very hard	181 mg/l and over

An MCL for hardness has not been established. In general, water having a hardness of less than 100 mg/L is not considered hard for ordinary domestic use. The raw water for the system was measured at 80 mg/L for Well 3 (1995) and 130 mg/L for Well 2 (2000). These values are still in the hard to moderately hard categories, but the samples are about 20 years old. The District should continue to monitor hardness levels and consider incorporating water softening in future planning phases. The water hardness also impacts the corrosivity of the water and reducing the water hardness may have negative impacts upon the lead and copper levels in the delivered water. If softening is desired in the future, then lead and copper testing should be performed to ensure that water corrosivity concerns do not become an issue.

3.1.1.4 Disinfection Byproducts (DBP)

Sodium hypochlorite is used as an oxidant in the oxidation/filtration. The target hypochlorite dosing is 0.5 mg/L exiting the filters. A chlorine residual is not maintained in the distribution system. Potassium permanganate is also used as a system oxidant. The potassium permanganate destroys some of the disinfection byproduct precursors and may decrease the overall chlorine dosing levels needed by the system. Increased potassium permanganate pre-oxidation may be used in the future to address DBP formation if needed.

The Stage 2 Disinfectants and Disinfection Byproducts (DBP) Rule regulates the concentration of disinfectant chemicals and byproducts that may be present in the distribution system water. These chemical species are considered primary contaminants. The MCL for these constituents are calculated on the basis of a running annual average (RAA) of the quarterly samples. Based on the system size, two samples from different locations are required. Each of the locational running annual average (LRAA) results must be in compliance. Annual sampling is required unless the results exceed the MCL, then quarterly sampling is required.

The concentrations of each of the trihalomethane compounds (trichloromethane, dibromochloromethane, bromodichloromethane, and tribromomethane) are totaled to determine the total trihalomethanes (TTHM) level. The MCL for TTHM is 0.080 mg/L. The concentrations of each of the five haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, bromoacetic acid, and dibromoacetic acid) are totaled to determine the haloacetic acids (HAA5s) level. The MCL for HAA5 is 0.060 mg/L. The treatment system does not use bromine as an oxidant, so bromate does not need to be monitored. TABLE 3-5, is a summary of the water testing performed on the system and the associated MCL.

Table 3-5 Disinfection By-Products

Contaminant	System Values (mg/L)	MCL (mg/L)
Trihalomethanes (THMs)	0.0591-0.0613	0.080
Haloacetic Acids (HAA5s)	0.0283-0.0295	0.060

3.1.1.5 Radionuclides

The State considers radionuclides primary contaminants. The MCLs for radionuclides are summarized in TABLE 3-6.

Table 3-6 Radionuclides MCLs

Substance	MCL (pCi/L)
Radium-226	3
Combined Radium-226 and Radium-228	5
Gross alpha particle activity (excluding uranium)	15

The State specifies that average annual concentration shall not produce an annual dose equivalent to the total body or any internal organ greater than four millirem/year.

3.1.1.6 Volatile Organic Chemicals (VOCs)

The State requires that public water systems sample and evaluate for Volatile Organic Chemicals (VOCs). If there are violations of the MCLs for any constituent, they must be addressed for elimination immediately. If there are no violations of the MCLs, the purveyor must sample again for VOCs after twelve months. If no VOCs (exclusive of the THMs) are verified after the initial twelve months of monitoring, purveyors of Community Water systems shall monitor each source at least once every thirty-six months. The VOC MCLs are summarized in Table 3-7.

Table 3-7 Volatile Organic Chemicals (VOCs) MCLs

Contaminant	MCL (mg/l)	Contaminant	MCL (mg/l)
Vinyl chloride	0.002	Monochlorobenzene	0.1
Benzene	0.005	o-Dichlorobenzene	0.6
Carbon tetrachloride	0.005	Styrene	0.1
1,2-Dichloroethane	0.005	Tetrachloroethylene	0.005
Trichloroethylene	0.005	Toluene	1
para-Dichlorobenzene	0.075	trans-1,2-Dichloroethylene	0.1
1,1-Dichloroethylene	0.007	Xylenes (total)	10
1,1,1-Trichloroethane	0.2	Dichloromethane	0.005
cis-1,2-Dichloroethylene	0.07	1,2,4-Trichlorobenzene	0.07
1,2-Dichloropropane	0.005	1,1,2-Trichloroethane	0.005
Ethylbenzene	0.7		

3.1.1.7 Synthetic Organic Chemicals (SOCs)

The synthetic organic chemical (SOC) MCLs are summarized in Table 3-8.

Table 3-8 Synthetic Organic Chemicals (SOCs) MCLs

Contaminant	MCL (mg/l)	Contaminant	MCL (mg/l)
Alachlor	0.002	2,4,5-TP	0.05
Aldicarb	0.003	Benzo[a]pyrene	0.0002
Aldicarb sulfoxide	0.004	Dalapon	0.2
Aldicarb sulfone	0.002	Di(2-ethylhexyl)adipate	0.4
Atrazine	0.003	Di(2-ethylhexyl)phthalate	0.006
Carbofuran	0.04	Dinoseb	0.007
Chlordane	0.002	Diquat	0.02
Dibromochloropropane	0.0002	Endothall	0.1
2,4-D	0.07	Endrin	0.002
Ethylene dibromide	0.00005	Glyphosate	0.7
Heptachlor	0.0004	Hexachlorobenzene	0.001
Heptachlor epoxide	0.0002	Hexachlorocyclopentadiene	0.05
Lindane	0.0002	Oxamyl (Vydate)	0.2
Methoxychlor	0.04	Picloram	0.5
Polychlorinated biphenyls	0.0005	Simazine	0.004
Pentachlorophenol	0.001	2,3,7,8-TCDD (Dioxin)	3x10 ⁻⁸
Toxaphene	0.003		

3.1.2 Average and Maximum Daily Demand

The average day demand (ADD) and maximum day demand (MDD) standards shall be in accordance with the WSDOH Design Manual which allows the calculation of ADD and MDD based on system data if at least two years of good data is available. As summarized in Section 2.1.3, the Water System’s ADD and MDD, based on past studies, are 178 gpd and 480 gpd, respectively.

3.1.3 Peak Hour Demand

The peak hour demand (PHD) standard shall be in accordance with the WSDOH Design Manual which allows the calculation of the PHD based on recorded MDD data and the number of system ERUs. As summarized in Section 2.1.3.4, the Water System’s PHD is 512 gpm based on 785 potential connections.

3.1.4 Storage Requirements

The Water System’s storage accounts for the five storage components identified by WSDOH including operational storage (OS), equalizing storage (ES), standby storage (SB), fire suppression storage (FSS), and dead storage (DS) as defined in the WSDOH Design Manual Chapter 9. The effective storage is the total storage volume less any dead storage.

The standby and fire suppression storage are allowed to be nested if allowed by the CWSP, County Fire Marshal, and local ordinance. If the required fire suppression storage is smaller than the required standby storage, then the fire suppression storage can be nested with the standby storage.

Standby storage is to address unusual situations encountered by the water system. It is desired to provide 2 days’ worth of average day demand with the largest well out of service or a minimum standby

storage of 200 gallons per ERU. WSDOH recommends developing source capacity such that they are able to replenish depleted fire suppression storage within a 72-hour period while concurrently supplying the MDD of the system.

Storage reservoirs supplying distribution systems by gravity are required to meet minimum pressures for the various storage components, as highlighted in Table 3-9:

Table 3-9 Storage Component Pressure Requirements

Storage Component(s)	Pressure Requirements
Operating plus Equalizing (at bottom of equalizing)	30 psi to highest gravity fed service meter
Nested Standby and Fire Suppression (at bottom of nested storage)	20 psi to highest gravity fed service meter and booster pump stations

Water storage is necessary for three reasons: to equalize daily fluctuations in demand, to provide large volumes of water for fires and to provide an emergency reserve in case the system should fail. The volume of the storage reservoir is determined by estimating future storage demands during the reasonable life of the reservoir. Since fire demand is the most significant demand, it usually governs the size of the storage tank.

The State of Washington Department of Health recommends that public water systems be able to meet a maximum daily demand (MDD) of not less than 800 gallons per day per residential connection or using the MDD established by data and calculations and provide MDD plus the required fire flow at a pressure of at least 20 psi. Fire flow requirements and calculations are discussed in Section 3.4.8.

3.1.5 System Pressure

The distribution system should be designed to permit gravity flow whenever feasible. Facilities should be designed and located to permit static pressures ranging from 40 psi to 90 psi and in no case produce static pressure below 30 psi or above 110 psi. The distribution system should be interconnected and looped to provide maximum service and reliability. The distribution system must be able to deliver the required fire flow during peak demand conditions at a minimum residual of 20 psi.

There are key elevations and minimum pressures used in the capacity calculations. WAC 246-290-230 specifies system pressure requirements which include maintaining 30 psi minimum during peak hour demand and all equalizing storage depleted and maintaining 20 psi minimum during maximum day demand with equalizing and fire suppression storage depleted. Individual pressure reducing valves (PRV) should be provided to service connections with an inlet pressure at or above 80 psi.

3.1.6 Distribution System

A general rule in system design is that a looped system comprised of moderately sized mains providing multiple (or alternate) routes to any area is much more reliable and efficient than a system comprised of a few large mains. A looped system also increases circulation of the water, which minimizes poor water quality associated with stagnant water.

Pipe material should be in conformance with specifications of the American Water Works Association (AWWA) and American Society for Testing and Materials (ASTM). The life expectancy of the improvements to the distribution system is at least 50 years and often an improvement is effective for many more years. The pipe material must help maximize life expectancy and be able to perform as

designed to meet strength requirements and to prevent corrosion. Accordingly, materials and construction will continue to be in accordance with the Washington State Chapter of the American Public Works Association (APWA) Standard Specifications. Presently the preferred pipe is PVC C900 water pipe.

In calculating the required new pipe sizes, some general rules or criteria are followed:

- No pipe smaller than 6 inches should be used where fire service is involved. In addition, use of water mains of less than 6 inches in diameter must be justified by the transmission of a hydraulic analysis to the Health Department. Justification is difficult because of the severe pressure drops in 4-inch pipe during fire flows.
- There is little difference between the construction cost of installing an 8-inch diameter pipe and 6-inch diameter pipe, yet the capacity of an 8 inch pipe is nearly twice that of 6-inch pipe. This is a very important consideration in selecting pipe sizes.
- An 8-inch diameter pipe should be provided between connections when the length between the connections exceeds 600 feet.
- A looped feeder or grid system comprised of moderately sized mains providing multiple (or alternate) routes to any area is much more reliable and efficient than a system comprised of a few large mains serving dead-end, small feeders.

3.1.7 Telemetry System

A telemetry system is integral to the operation of a water system allowing automatic operation that is necessary for optimizing the system storage and capacity. Telemetry systems can range from simple analog controls to complex computerized systems (i.e., Programmable Logic Controllers – PLCs). All telemetry system parts and installation should meet applicable electrical codes. At a minimum, the telemetry system should have the following capabilities:

- Automatically Control the Well(s) Operation Based on Reservoir Level
- Reservoir Level Alarms (High And Low)
- Automatic Regeneration/Backwashing of Treatment System Filters Based on Water Usage
- Power Failure Alarm
- Autodialer for Alarm Conditions

3.1.8 Backup Power Requirements

Purveyors are required to plan for unscheduled power outages. The reservoir standby storage is intended to supply the system in the event of a power outage for approximately two days. In addition to the standby storage, a backup power generator setup to provide emergency power to the wells and booster pumps during power outages can provide added protection. WSDOH requires automatic backup power for some situations (e.g., water treatment); however, with adequate standby storage and an autodialer that calls the system operator with a power interruption warning, a manual switch should suffice. An emergency generator is currently installed to allow the booster pump station to provide pressurized water in the event of a power outage. However, a generator should be installed to allow the wells to be active in case of an extended power outage. The generator switch should meet all applicable electrical codes. The generator fuel supply should meet all applicable codes and especially spill control measures.

3.1.9 Valve and Hydrant Spacing

WSDOH standards state that valves on distribution mains 12-inches and smaller should be spaced no more than 1,000 feet apart and valves be installed at intersections of mains and/or streets such that individual streets (or portions of streets if over 1,000-feet long) can be isolated for maintenance purposes. According to the Island County Code Section 13.03A.090, "All hydrants in fire flow system shall be spaced so as to ensure that all commercial, industrial, or multifamily structures or building sites

served by the system shall be reached by unobstructed hose lays of no greater than 500 feet to all parts of any structure." Additionally, "Fire hydrants shall be located at roadway intersections wherever possible, and the distance between them shall be no further than 900 feet, or as necessary to meet the hose lay requirements for commercial, industrial, or multifamily structures or building sites." The distribution system's hydrants shall be spaced so as to meet these standards.

Currently the distribution system has portions of the system that don't have hydrants located in positions that can serve all structures in accordance with the latest Island County Codes. In addition, there are portions of the system where lines are not of sufficient size to provide the necessary fire flow of 500 gpm as would be required to serve new hydrants. The northern portion of the system, above Samish Court, has line sizes and hydrants located to serve nearly all house. However, the lower portion of the system has many areas that lack the line size and hydrants in order to fully meet the fire flow demand. See Section 3.5.4 for a discussion of proposed improvements to the system to expand future fire flow capabilities.

3.2 Water Quality Analysis

The Scatchet Head Water District monitors the system's water quality in accordance with Washington State Department of Health (WSDOH) requirements and consistently meets or exceeds all testing criteria. The Safe Drinking Water Act (SDWA) and its amendments have increased the monitoring requirements to include Trihalomethanes, Radionuclides and Volatile and Synthetic Organic Compounds. Water treatment is provided for reducing Iron and Manganese in raw water from both wells.

3.2.1 Water Testing

3.2.1.1 Radionuclides

Both sources are in compliance with USA radionuclide maximum contaminate criteria. Testing is done every 6 years.

3.2.1.2 Arsenic

The District is required to monitor arsenic quarterly at the entry point to the distribution system. Most recent test was completed in May of 2019. The water has been within the maximum contaminant level since 2016.

3.2.1.3 Lead and Copper

The District has completed lead and copper sampling in 2018 in accordance with the EPA regulations. They were within maximum contaminant levels and will have another set of sampling to perform in 2021.

3.2.1.4 Synthetic and Volatile Organic Chemicals

Volatile Organic Chemicals were tested in 2016 and will be sampled again in 2022. Due to an increase in exceedances, the sampling for THMs and HAA5s has increased to quarterly sampling.

3.2.1.5 Bacteriological

A single Coliform sample is collected at one of several sites throughout the system monthly according to the Coliform Monitoring Plan. A copy of this plan is provided in APPENDIX R.

3.2.1.6 Asbestos

The District's distribution system piping has some asbestos cement walled pipe in use. Past and current testing of distribution system water has found no detectable suspended Asbestos particles in the drinking water. The system will continue to test as required, but the existing AC pipe appears to be quite stable. This is not a contaminant of concern at the time this report was compiled.

3.2.2 Source Water Quality

The wellhead protection plan was developed to help identify items and situations that could possibly pose a threat to the water quality of the system. Well 2 has the best raw water quality, while Well 3 naturally occurring contaminants of concern include iron and manganese. Below is a discussion of the approach and criteria for each.

The water delivered to the distribution system meets WSDOH requirements and the bacteriological tests regularly show lack of any contamination. The system has had previous issues with bacteria contamination and the ability to maintain a chlorine residual in furthest sections of the distribution system. In 2000 a post filtration hypochlorination injector was installed which has resolved the issues. The functionality of the system should be evaluated to ensure it continues to meet state requirements.

3.2.3 Iron and Manganese

The existing filtration system has been modified over the years and this system appears to effectively remove iron and manganese. Due to the nature of the treatment systems development in, 1998 through 2001, it should be evaluated to ensure the treatment system is still being optimized to provide optimal performance with the minimal amount of operator interaction.

3.2.4 Wellhead Protection

Since the District obtains its water from wells, protection of the source aquifer is critical to the long-term viability of the system. The District has prepared a wellhead protection plan (see Chapter 6) and has plans to implement the initial public education phase of the program. The current Wellhead Protection Program is included in APPENDIX JAPPENDIX J.

3.2.5 Safe Drinking Water Act

The amendments to the Safe Drinking Water Act are not expected to significantly impact the District. All required tests have been completed and they are in compliance with all current requirements.

3.2.6 Saltwater Intrusion

Due to the existence of saltwater intrusion in many wells located on the shorelines of Washington State, the possibility of seawater intrusion into the potable water aquifers must be investigated on a regular basis. Based on the levels of chloride concentration in the District's wells the WSDOH categorizes the District's water sources as low risk. The low risk category includes water systems with a history of chloride analysis showing concentration of less than 100 mg/l and not in proximity (1/2 mile) to any ground water source with chloride concentrations equal to or greater than 100 mg/l.

It is recommended that the District continues testing of the well water sources for chloride to check for any long-term trends in the aquifer. In addition, accurate elevations on the pumping water wells of each of the systems wells should be obtained for historical trending and analysis.

3.2.7 Finished Water Quality

Since the source of water is from deep wells which are well protected, the reservoir is sealed, and the distribution system samples of the water System has continued to show adequate water quality and an acceptable chlorine residual. The installed oxidation/filtration system should be evaluated to ensure optimization and capacity for future serviceability.

3.3 System Description and Analysis

Potential system improvements were determined by modeling, analysis of system testing/studies, and review of District policy. There are no system deficiencies involving health or safety issues. The distribution system needs by functional group are summarized in the following sections

3.3.1 Source

The Scatchet Head Water system has a Certificate of Water Right from the Washington State Department of Ecology for Well 1 dated April 27, 1973. This certificate granted a maximum instantaneous withdrawal of 90 gpm and a maximum annual allotment of 101.1 acre-feet. The well head elevation was approximately 20-feet above sea level. The well depth was 90-feet (approximately 70-feet below mean sea level). Due to poor water quality the well was abandoned in 1996. The well casing has been cut-off below grade and the casing filled in accordance with Washington State Department of Ecology standards. The District will continue to explore options to transfer the water right to Well 2, Well 3, or a future well.

Wells No. 2 and 3 are located on a parcel owned by the Water District located southwest of the intersection of George Drive and Samish Court. The District’s source type, location, use information and limiting conditions are summarized in Table 3-10.

Table 3-10 Source Type, Location, and Use Information

	Well 1	Well 2	Well 3
Source Type	Well (Abandoned)	Well (Non GWI)	Well (Non GWI)
DOE Tag	N/A	ABR417	ABW832
Source Location	Island County Parcel S8110-03-0000A-2	Island County Parcel S8110-00-12018-2	Island County Parcel S8110-00-12018-2
Purpose of Use	None	domestic water supply - primary	domestic water supply - primary
Place of Use	not in use	see water right	see water right
Provisions or Limiting Condition	Abandoned	150-gpm when pumping simultaneously with Well 3	80-gpm when pumping simultaneously with Well 3

WSDOH requirements for ground water sources require that the well shall be located, constructed and maintained in a manner which will assure the minimum possibility of contamination, and be so situated and developed as to prevent surface water from entering the well. To assure adequate sanitary control in the vicinity of the well, the District must control all land within a radius of 100 feet of the well, except that the District shall control land of a greater or lesser size or of a different shape than is defined by a 100 foot radius where an evaluation of geological and hydrological data, well construction details, and other relevant factors indicates that a control area of different size or shape will assure adequate

sanitary control in the vicinity of the well. Bacteriological, chemical and physical water quality requirements are discussed in Section 3.2 in conjunction with an analysis of the existing source water.

The District’s well elevations, flows, and capacities are summarized in Table 3-11.

Table 3-11 Well Elevations and Capacities

	Well 2	Well 3
Year of Construction	1980	1995
Casing Size	10"	8"
Ground Elevation	192	~ 190
Well Depth (ft)	295	246
Drilled Depth of Well (ft)	295	403
Bottom Well Elevation	-103	-210
Static Water Elevation	190	n/a
Top Screen Measure Down (ft)	242	231
Top Screen Elevation	-50	-41
Bottom Screen Measure Down (ft)	246	234
Bottom Screen Elevation	-54	-44
Design Flow (gpm)	250	n/a
Drawdown @ Design Flow (Ft)	40	n/a

3.3.1.1 Maximum Instantaneous Withdraw Rate for Each Source

The maximum instantaneous and sustainable withdrawal rate for each source is summarized in Table 3-12.

Table 3-12 Source Well Withdraw Rate

Well #	Maximum Pump Capacity (gpm)	Current Pumping Rate (gpm)	Water Right Qi (gpm)
1 ¹	-	-	-
2	150	125	125
3	80	80	90
Total	230	205	215

¹ The well has been abandoned.

As shown in Table 3-12, the existing Wells 2 and 3 have a current pumping capacity of 205 gpm. The treatment system installed at the Guemes Avenue pumphouse was designed to handle capacities of Wells No. 2 and 3.

3.3.1.2 Current Condition of Each Source

The sources are routinely monitored by the operator. No problems have been reported that would indicate an adverse condition was present.

3.3.1.3 Current Facility Age and Estimate of Future Life Expectancy

Well 2 was constructed in 1980 and Well 3 was constructed in 1995. Both sources should remain in relatively good condition through 2025. The well pump for Well#2 was replaced in 1999. It is believed that the submersible pump in Well 3 is original. If the water levels are kept above the screens, the well

screens should last through 2025. Depending on the operating conditions of the well pumps (i.e., if the head/flow and cycle times are within manufacturer recommendations), the well pumps should last through the phase I planning cycle. However, as submersible pumps may fail without much warning, it is recommended that adequate reserves should be kept on hand to fund a well pump replacement.

3.3.1.4 Fluctuations and/or Trends in Source Capacity

The source wells do not appear to experience seasonal fluctuations or is there evidence of reduction in capacity. The wells appear to be currently functioning adequately.

3.3.1.5 Condition and Capacity of Transmission Mains

A dedicated 6-inch fill line from Wells 2 and 3 to the reservoir site on Guemes Avenue was constructed in 1999 and should be in good condition through at least the first two planning phases. However, the transmission mains in the pumphouse located at the Guemes Avenue reservoir site have experienced leaking at an increased rate in the past few years. It is recommended that an assessment be conducted of the piping within the pumphouse on Guemes Avenue and at the well site on George Drive to evaluate the need to replace or repair piping to ensure future functionality of the treatment and distribution system.

3.3.2 Treatment

As described previously, the only treatment of the system is filtering of water from Wells 2 and 3 to reduce iron and manganese levels. In 1998 the District developed a disinfection and flushing plan to achieve a minimum chlorine residual of 0.2 mg/L at the end of the distribution system. The water system had difficulty in maintaining the required chlorine residual, so it developed a plan to install and ozonation and filtration system in 1999. However, as part of a major improvements project treatment and a dedicated fill line were conveyed up to a new pumphouse on the parcel with the Guemes Avenue reservoir. With these improvements post-filtration hypochlorination injection was added which was able to provide the necessary water quality for the distribution system.

Due to the nature of how the treatment system was developed over time it is recommended that the District have an analysis performed on the treatment system to ensure it is functioning as intended in an efficient manner.

3.3.3 Storage

Water storage is necessary for multiple reasons. These reasons include an adequate storage volume to meet the daily fluctuations in demand, a sufficient volume to allow adequate runtime for pumps and the treatment system(s), an emergency reserve in case the supply system should fail, and to provide a large volume water for potential firefighting needs.

The system capacity was analyzed using only the Guemes Avenue reservoir, since the Maple Point Drive only provides standby storage capacity. The Guemes Avenue Reservoir #1 is 85' tall round steel reservoir with an inside diameter of 24 feet. The total capacity is 288,000 gallons or 3,400 gallon/foot of height. The reservoir provides the following storage components:

- Operational Storage (OS)
- Equalizing Storage (ES)
- Standby Storage (SB)
- Dead Storage (DS)

The storage capacity of the system is discussed the subsequent subsections.

3.3.3.1 Operational Storage

Operational storage is the height difference between where the well pumps are turned on and off. Equalizing storage is defined as the volume of storage needed to supplement the sources when the peak hourly demand exceeds the total source pumping capacity. Stand-by storage is defined as the volume of stored water available for use during a loss of well production, such as from a power interruption, well pump failure, or similar short-term emergency. Dead storage is the portion of the reservoir that is not usable for storage. Dead storage includes the volume at the top that is needed for installation of the overflow pipe and the offset at the bottom of the tank that is used for silt accumulation.

Operational Storage (OS) is the amount of volume that is needed to supply the system when the well pumps are off. This prevents the excess cycling of well pumps, in a similar manner that bladder tanks provide pump protection. It is assumed that one foot of elevation difference exists between the well pump on and off signals

$$OS = 1 \text{ foot} \times 3,400 \text{ gallons/foot} = 3,400 \text{ gallons}$$

$$3,400 \text{ gallons} / 191 \text{ gpm (well production)} = 18 \text{ minutes of runtime}$$

The pumps will be running for at least 15 minutes after each start. Therefore, the submersible well pumps will not have more than four starts per hour. The OS is adequate to minimize the number of pump starts per hour.

3.3.3.2 Equalizing Storage

Equalizing Storage (ES) is the volume of water that is needed to meet the peak demand period for the water system. From Equation 9-1:

$$ES \text{ (gallons)} = (\text{PHD} - Q_s) \times 150 \text{ minutes}$$

Where:

PHD = peak hour demand 366 gpm (Section 2.1.3.4 above);

Q_s = well pump capacity, 191 gpm;

$$ES = (366 - 191) \text{ gpm} \times 150 \text{ minutes} = 26,300 \text{ gallons (or 7.8 feet)}$$

3.3.3.3 Dead Storage

Dead Storage (DS) is the unusable volume at the top and bottom of the tank. Approximately six inches (6") is provided at the top for the overflow pipe (freeboard) and additional six inches (6") at the bottom of the tank. Therefore, a total of twelve inches (12") or one foot (1.0') of dead storage is provided.

$$DS = 1.0 \text{ foot} \times 3,400 \text{ gallons/foot} = 3,400 \text{ gallons}$$

3.3.3.4 Standby Storage

The amount of water available as standby storage can be assumed to be the amount of storage not already utilized.

$$SB \text{ Storage} = \text{Total Reservoir capacity} - OS - ES - DS$$

$$SB \text{ Storage} = 287,700 - 3,400 - 26,300 - 3,400 = 254,600 \text{ gallons (or 75.2 feet)}$$

Standby storage (SB) is the volume of water that would be needed to supply the system in case of a problem with the source. The minimum recommended volume is 200 gallons per ERU.

$$\text{SB storage (desired)} = (2)(\text{ADD})(N) - t_m(Q_s - Q_i)$$

$$\begin{aligned} \text{SB storage (desired)} &= (2) (200 \text{ gpd/ERU}) (597 \text{ ERUs}) - 1,329 \text{ min} (191 \text{ gpm} - 125 \text{ gpm}) \\ &= 151,000 \text{ gallons (or 44.6 feet)} \end{aligned}$$

The existing reservoir provides approximately 254,600 gallons of stand-by storage (or 420 gallons per ERU). This exceeds the ADD and is more than 2 times (or two days of storage) during the typical summer demand.

3.3.3.5 Fire Flow Storage

The reservoir was also analyzed to determine fire flow capability of the system. As noted above, residential fire flow requirement is 500 gpm for 30 minutes of 15,000 gallons of storage. Accounting for the fire flow storage, there will be a remaining SB storage of 239,600 gallons, which is still higher than the recommended value for standby storage volume.

3.3.3.6 Storage Summary

The provided storage volumes are summarized in the Table 3-13 below.

Table 3-13 Storage Components

Component	Volume (gallons)	Equivalent Height (feet)
Overflow Dead Volume	1,700	0.5
Operational Storage	3,400	1.0
Equalizing Storage	26,300	7.8
Standby Storage	254,600	75.2
Fire Suppression (nested with SB)	(15,000)	(4.4)
Bottom Dead Storage	1,700	0.5
Total	287,700	85.0

3.3.3.7 Water Age and Turnover

Water age may sometimes become a problem in storage reservoirs, especially when the system is not at its maximum design capacity. The average age of the water in the reservoir is calculated based upon the lowest recorded average day demand of 83 gpd/ERU recorded in 2011. Based upon the existing 410 ERUs this equates to 34,000 gallons. See water use data provided in APPENDIX L.

$$\text{Water Age} = \frac{\text{Storage Volume}}{\text{ADD} \times \text{ERUs}} = \frac{288,000 \text{ gallons}}{34,000 \text{ gallons per day}} = 8.5 \text{ days}$$

It is recommended that complete turnover of water should occur at least every three to five days. The water in the reservoir does not have adequate turnover during winter months. Currently, the Maple Point Reservoir has a recirculating pump installed to assist in turnover. If the system receives complaints, an aeration system or a recirculation pump for the Guemes Avenue Reservoir may be needed.

3.3.4 Distribution

Mains throughout the system are tapped for the individual service connections. Currently there is a dedicated fill line from the well field (Wells 2 and 3) up to the Guemes Avenue Reservoir. The following sections provide additional details on the distribution system.

3.3.4.1 Length, Diameter, and Type of Pipe in the System

A comprehensive inventory of the system is provided in APPENDIX O. A summary of the pipe within the system is provided in

Table 3-14 Pipe Inventory

Nominal Pipe Diameter	AC (ft)	PVC (ft)	Ductile Iron (ft)	TOTAL (ft)
8"		567	312	879
6"	9,755	12,347	940	23,042
4"		8,695		8,695
2"/2.5"		6,636		6,636
			TOTAL	39,252

Asbestos cement (AC) pipe was used for most of the original construction of the system, but most recent pipe has been mostly PVC. The District's current standards require Schedule C-900 PVC or ductile iron pipe for new extensions and replacements. The District continues to strive to add piping to the distribution system and complete loops to provide a more reliable and efficient distribution system. Looping also reduces stagnant water and dead-end lines which improved water quality via increased circulation.

3.4 Capacity Analysis

The system capacity was calculated in accordance with the DOH Water System Design Manual (December 2009) using the equations/procedures in Chapter 6: Water System Physical Analysis: ERUs.

The capacity calculations are based on the accepted design values of 200 gpd/ERU for ADD and 425 gpd/ERU for MDD. The system capacity was calculated and expressed in terms of Equivalent Residential Units (ERUs) based on existing system parameters. System consumption data including Average Day Demand (ADD) and Maximum Day Demand (MDD) expressed in terms of gallons per day per ERU was used throughout the system capacity calculations.

This updated Water System plan provides an analysis of the existing capacity of the Scatchet Head Water District's distribution system to support an increase in the approved number of connections up to 597 ERUs.

3.4.1 Existing System Configuration

The water system is currently served by two groundwater wells (Well #2 and Well #3) with 30 and 15 HP submersible pumps, respectively. Well #2, installed in 1980, is capable of providing 125 gpm and Well #3, installed in 1995, provides 66 gpm. The Water Facilities Inventory (WFI) lists the production of these wells at 150 gpm and 80 gpm. Additional information is available in the Appendices, including copies of the well logs in APPENDIX H and the WFI in APPENDIX E. Water Right limitations set the maximum withdrawal rate from both wells at 215 gpm. See APPENDIX F for a copy of the District's water right.

Source water from the system's wells are treated by an oxidation/filtration system. The treatment system consists of pre-chlorination, aeration, contact time in retention vessel (contact tank) and

pressure filtration utilizing Birm® media. The treatment system was designed to reduce the levels of iron and manganese to less than 50 percent of the Maximum Contamination Levels (MCL). The pre-chlorination is provided to mitigate fouling of the treatment media by iron and sulfate-reducing bacteria. The water treatment system discharges directly to the top of the adjacent 300,000 gallon reservoir.

The reservoir located adjacent to the treatment/booster pump building is referred to as the Guemes Avenue Reservoir (or Reservoir #1). The Guemes Avenue Reservoir (Reservoir #1), installed in 1994, is 24' in diameter and 85' tall with storage capacity of approximately 300,000 gal. The system has a second supplemental reservoir, located at the end of Maple Point Drive. The Maple Pt. Dr. Reservoir (Reservoir #2) was installed in 1997 and serves as a standby storage. It is 14.5' in diameter and 95' tall with storage capacity of approximately 119,000 gallons. The Guemes Avenue and Maple Point Drive reservoirs are located at an elevation of 365 feet and 350 feet, respectively. Float level switches in the Guemes Avenue reservoir control the operation of the well pumps. An altitude valve maintains the water level in the Maple Point Reservoir.

A booster pump station located within the treatment/pump house building provides pressurized water to the distribution system. The booster pump system is composed of four booster pumps with automated alternate operation. These identical booster pumps are Aurora Series 340 / 360, 7.5 HP, 3500 RPM. Each pump is capable of supplying 200 gpm at 45 psi (260 gpm at 30 psi). A 2,120 gallon hydropneumatic tank provides pump protection.

The main pressure distribution system is a combination of 4, 6 and 8-inch diameter polyvinyl chloride pipes (PVC). The distribution system is divided into three pressure zones. The high zone maintains a hydraulic grade line (HGL) of 445-feet. The intermediate zone has HGL of 280-feet and low zone has a HGL of 150-feet. There are 353, 79 and 60 lots in the high, intermediate and low zones, respectively. These areas are separated pressure reducing valves along Periwinkle Road, Fidalgo Drive and Driftwood Drive. The booster pumps are located at an elevation of 365 feet with minimum pressure of 35 psi or 80 feet which equates to the 445-foot HGL. The elevations of the intermediate pressure reducing valves are approximately 180-feet and have a downstream pressure of 45 psi. This equates to 285-foot HGL, The Driftwood Drive PRV has a downstream pressure of 55 psi which equates to 150-foot HGL. The locations of the existing wells, pump house and reservoirs and the pressures zones are highlighted in Figure 3-1:

Figure 3-1 Scatchet Head Pressure Zones



3.4.2 Source Summary

The water system is currently served by two groundwater wells (Well #2 and Well #3) with 30 and 15 HP submersible pumps, respectively. Well #2, installed in 1980, is capable of providing 125 gpm and Well #3, installed in 1995, provides 66 gpm. The Water Facilities Inventory (WFI) lists the production of these wells at 150 gpm and 80 gpm. See Table 3-15 for a summary of each well and its parameters

Table 3-15 Well Parameters

Parameter	Well 2	Well 3
Source (WFI)	S02	S03
Drill Date	May 1980	Oct 1995
Well Tag ID #	ABR417	ABW832
Current Well Production (gpm)	125	66
Water Right Qi (gpm)	125	90
WFI Listed Capacity (gpm)	150	80
Completed Depth	295'	246'
Casing Diameter	10"	8"
Well Head Elevation (estimated)	210'	210'
Perforated Interval	242'-246'	231'-234'
Static Water Level	190'	193'
Pump Test (gpm)	250	66
Drawdown (feet)	40	23
Yield (gpm/foot of drawdown)	6.25	2.87

3.4.3 Water Usage & System Design Values

Water usage from the last seven years was analyzed to determine current design values for the system. The water use data for these periods is provided in APPENDIX L. The annual average day demand (ADD) water usage was 120 gpd/ERU for this period. The summer (June-September) ADD value for the last 3 years is approximately 200 gpd/ERU. For a conservative analysis the summer ADD will be used as the system ADD.

The maximum day demand (MDD) could not be determined from actual water use data due to lack of daily source meter readings. Therefore, a multiplier of 1.7 is used to estimate MDD from maximum monthly average day demand (MADD). The design MADD is 250 gpd/ERU which equates to MDD value of 425 gpd/ERU.

3.4.4 Water Rights

Water Right number G1-23621C (Priority Date June 11, 1980) and G1-20574P (Priority Date April 29, 1973) have been granted to Well #2 and #3, respectively. A copy of the water right certificate for well #2 is provided in APPENDIX F. A copy of the water right certificate for well #3 is not available on the Department of Ecology website and a screenshot of this information is also provided in APPENDIX F. The combined water rights for these wells allow for total instantaneous withdrawal of 215 gpm and an annual withdrawal of 241.4 ac-ft/yr.

3.4.5 System Capacity Based on Existing Source Water Rights

The combined water rights for Well #2 & 3 allow for total instantaneous withdrawal of 215 gpm and an annual withdrawal of 241.4 ac-ft/yr.

The annual water usage at full build-out is estimated by the Equation 3-1 to determine the number of ERUs based upon Average Daily Demand (ADD):

Equation 3-1 ERUs Determination by ADD

$$N = \frac{V_a}{(365)(ADD)} = \frac{\sum_a^1 (Q_a)(t_a)}{(365)(ADD)} \quad (\text{Based on an Annual time period})$$

- Where:
- N = Number of ERUs
 - V_a = The Annual Volume of Water Available and Used from all Sources, except Emergency Sources, for the System, (gallons/year)
 - ADD = Average Daily Demand per ERU, gpd/ERU
 - Q_a = Flow rate of source 'a', gpm
 - t_a = Time that source 'a' is used per year, min/yr

ADD was determined to be 200 gpd/ERU and the current water right annual withdrawal of 241 ac-ft/yr used for the annual volume (V_a), then the number of total ERUs that may be served calculates to 1,077 ERUs.

Equation 3-2 taken from the DOH Water System Design Manual which is used for determination of allowable ERUs associated with the peak instantaneous source capacity and MDD:):

Equation 3-2 ERUs Determination by MDD

$$N = \frac{V_d}{MDD} = \frac{\sum_d^1 (Q_d)(t_d)}{MDD} \quad (\text{Based on a Maximum Day Demand})$$

- Where:
- N = Number of ERUs
 - V_d = Total Volume of Water Available and Used for a Maximum Day's Demand for the System, (gallons/maximum day)
 - MDD = Maximum Daily Demand per ERU, gpd/ERU
 - Q_d = Flow rate of source 'd', gpm
 - t_d = Time that source operates per day, minutes/day

MDD was determined to be 425 gpd/ERU and the current water right peak instantaneous withdrawal rate of 215 gpm results in the number of total ERUs that may be served is 672 ERUs.

3.4.6 System Capacity Based on Existing Well Pumping Capacity

The equation in FIGURE 3-3 was used for determination of allowable ERUs associated with the well pumping capacity and MDD. MDD is 425 gpd/ERU and the well pumping capacity for Well #2 & Well #3 (125 gpm & 66 gpm) for a time of 55.4 minutes per hour to account for the downtime associated with filter backwashing. The number of ERUs calculated is 597 ERUs. This is the current limiting capacity of the water system.

3.4.7 System Capacity Based on Treatment Capacity

The equation in FIGURE 3-3 was used for determination of allowable ERUs associated with the treatment capacity and MDD. MDD is 425 gpd/ERU and the treatment capacity of 240 gpm for a time of 55.4 minutes per hour to account for the downtime associated with filter backwashing. The number of ERUs calculated is 751 ERUs.

3.4.8 System Capacity Based on Booster Pump Capacity

The booster pump station is needed to supply pressure to the entire distribution system. The system has a redundant pumping system composed of four Aurora Series 340 / 360 Pumps, 7.5 HP, 3500 RPM. These pumps are capable of providing 220 gpm at 40 psi during normal operation. The pumps provide the capacity to meet both the PHD and the fire flow demands of the system. The installed pumps have a capacity of approximately 260 gpm at 30 psi. 30 psi is the minimum pressure at the pump house to ensure that 20 psi is maintained throughout the distribution system when both peak demand and fireflow is needed.

The fire flow requirement in rural Island County is 500 gpm, while maintaining a minimum system residual pressure of 20 psi in all parts of the distributions system. The remaining booster pump capacity after accounting for fire flow is 540 gpm. The booster pump capacity is summarized in Table 3-16.

Table 3-16 Booster Pump Capacity

Capacity	flowrate
Total 4 Pumps	1040 gpm
Fireflow	500 gpm
Remaining Capacity for Domestic Flow	540 gpm

The Equation provided in Figure 3-2 determines the number of ERUs

Figure 3-2 ERU Determination by Booster Pump Design

$$N = \frac{[1440(PHD - 18)]}{MDD - F} \cdot C$$

- Where:
- N = Number of ERUs
 - PHD = Peak Hour Demand, (gallons/minute) (Booster Pump Capacity)
 - MDD = Maximum Daily Demand per ERU, gpd/ERU
 - F = PHD Coefficient from Table 3-3 and Table 3-4
 - C = PHD Coefficient from Table 3-3 and Table 3-4

MDD is 425 gpd/ERU and the booster pump capacity of 540 gpm. F is 225 and C is 1.6 based on the above data. The number of ERUs calculated is 965 ERUs.

3.4.9 System Capacity based on Existing Storage Volumes

The system contains two reservoirs: #1 is on Guemes Avenue and #2 is on Maple Point Drive. The Maple Point Drive reservoir provides only standby storage, so system capacity was analyzed using only the Guemes Avenue reservoir. Reservoir #1 is 85’ tall round concrete reservoir with an inside diameter of 24 feet. The total capacity is 288,000 gallons or 3,400 gallon/foot of height.

The reservoir provides the following storage components:

- Operational Storage (OS)
- Equalizing Storage (ES),
- Stand-by Storage (SBS) and
- Dead Storage (DS)

Operational storage is the height difference between where the well pumps are turned on and off, so the system is supplied when the well pumps are off. This prevents the excess cycling of well pumps, in a similar manner that bladder tanks provide pump protection. It is assumed that one foot of elevation difference exists between the well pump on and off signals. The calculation for operation storage is provided below:

$$OS = 1 \text{ foot} \times 3,400 \text{ gallons/foot} = 3,400 \text{ gallons}$$

Dead (DS) is the unusable volume at the top and bottom of the tank. Approximately six inches (6") is provided at the top for the overflow pipe (freeboard) and additional six inches (6") at the bottom of the tank. Therefore, a total of twelve inches (12") or one foot (1.0') of dead storage is provided.

$$DS \text{ (gallons)} = 1.0 \text{ foot} \times 3,400 \text{ gallons/foot} = 3,400 \text{ gallons}$$

Equalizing storage is defined as the volume of storage needed to supplement the sources when the peak hourly demand exceeds the total source pumping capacity. The calculation for equalizing storage is provided below:

$$ES \text{ (gallons)} = (\text{PHD}-Q_s) \times 150 \text{ minutes}$$

Where:

$$\text{PHD} = 366 \text{ gpm (see section above)}$$

$$Q_s = \text{Well pump capacity (191 gpm)}$$

$$ES = (366-191) \text{ gpm} \times 150 \text{ minutes} = 26,300 \text{ gallons (or 7.8 feet)}$$

The amount of water available as standby storage can be assumed to be the amount of storage not already utilized:

$$\text{SBS (gallons)} = \text{Total Reservoir Capacity} - (\text{OS}+\text{ES}+\text{DS})$$

Therefore:

$$\text{SBS} = 287,700 - (3,400 + 26,300 + 3,400) = 254,600 \text{ gallons (or 75.2 feet)}$$

Standby storage (SB) is the volume of water that would be needed to supply the system in case of a problem with the source. The minimum recommended volume is 200 gallons per ERU.

$$\text{SBS (desired)} = (2)(\text{ADD})(N) - \text{tm}(Q_S - Q_L)$$

Therefore:

$$\begin{aligned} \text{SBS (desired)} &= (2) (200 \text{ gpd/ERU}) (597 \text{ ERUs}) - 1,329 \text{ min} (191 \text{ gpm} - 125 \text{ gpm}) \\ &= 151,000 \text{ gallons (or 44.6-feet)} \end{aligned}$$

The existing reservoir provides approximately 254,600 gallons of stand-by storage (or 420 gallons per ERU). This exceeds the ADD and is more than 2 times (or two days of storage) during the typical summer demand.

The reservoir was also analyzed to determine fire flow capability of the system. As noted above, residential fire flow requirement is 500 gpm for 30 minutes of 15,000 gallons of storage. Accounting for

the fire flow storage, there will be a remaining SB storage of 239,600 gallons, which is still higher than the recommended value for standby storage volume.

The provided storage volumes are summarized in the Table 3-17:

Table 3-17 Storage Components

Component	Volume (gallons)	Equivalent Height (feet)
Overflow Dead Volume	1,700	0.5
Operational Storage	3,400	1.0
Equalizing Storage	26,300	7.8
Standby Storage	254,600	75.2
Fire Suppression (nested with SB)	(15,000)	(4.4)
Bottom Dead Storage	1,700	0.5
Total	287,700	85.0

3.4.10 Pressure Tank Sizing

Pressure tank is already installed for pump protection. The pneumatic tank sizing equation for a horizontally oriented tank is provided in Figure 3-3

Figure 3-3 Equation for Pnuematic Tank Sizing

$$V_T = \frac{[(P_1 + 14.7)]}{P_1 - P_2} * \frac{15Q_p(MF)}{N_c}$$

- Where:
- V_T = Total Volume Require (gallons)
 - P_1 = Pump off pressure (55 psi)
 - P_2 = Pump on pressure (35 psi)
 - Q_p = pump capacity at the midpoint (200 gpm at 45psi)
 - N_c = number of pump starts per hour. Since a quadruplex alternating pumping system is being specified, a total of 24 starts will be allowed per hour (6 starts for each pump))
 - MF = Multiplying Factor from Table 11-2 (66" diameter = 1.05)

Based upon the above parameters, a total volume of 460 gallon of storage is needed. The system currently provides 2,120 gallons of storage which is adequate.

3.4.11 Summary of System Capacity Based on Existing Conditions

An analysis of the system components, water rights and well capacities was performed to determine which item provided the system's connection limit. The calculations for this are summarized in Table 3-18:

Table 3-18 Connection Limiting Factors

Components	Maximum Value	Potential Connections
Instantaneous Water Right Q_i	215 gpm	672
Annual Water Right Q_a	241 ac-ft/year	1,077
Source Capacity	191 gpm	597
Treatment System	240 gpm	751
Booster Pumps	540 gpm	965

The source capacity was determined to be the limiting factor.

3.5 Selection and Justification of Improvement Projects

Improvements to the system are required to alleviate the needs discussed in Chapter 3. In order to select and justify the improvements, the Needs are prioritized based on the categories shown in Table 3-19:

Table 3-19 Potential Improvements Prioritization Categories

Category	Description	Time Frame
Emergency	Improvement needed to eliminate a health risk or serious physical risk to the system	now
Immediate	Improvement that should be investigated, initiated, and/or completed as soon as possible to minimize potential risk or to get process started for future needs	within 1 year
Near Term	Improvement that improves capacity, flow, or redundancy	1 to 2 years
Medium Range	Improvement that is not necessary near term but will improve system enough that it should not be long term	2 to 6 years
Long Range	Improvement that is needed in the future	6+ years
Budget Providing	Non-critical improvement that can occur anytime budget providing	anytime budget providing

The time frames shown in Table 3-19 are for guidance purposes and are subject to change based on such factors as regulations and the Water System's financial situation.

The potential system improvements discussed in Section 3.3 were prioritized based on the categories in Table 3-19 and summarized in Table 3-20.

3.5.1 Source Needs

Source production is not a future limiting factor if the District has water rights for both Wells 1 and 2 available for use by their sources. The system should pursue clarification regarding the status of transferring the water right from Well 1 to Well 3 or to another well in the future.

The District is no longer using Well 1 as a source of water for the system. The existing water rights should be reviewed with an attorney and the DOE to verify that the SHWD has adequate perfected and permitted water rights to meet the future systems anticipated needs and is making satisfactory progress on perfecting the permitted water rights. Adequate water rights are essential to ensuring the long-term viability of the system.

3.5.2 Treatment Needs

The on-site hypochlorite generation injection system currently provides sufficient disinfection and has capacity to meet the current demands through the initial planning period. However, if production is increased from Well 3 the treatment system would be the limiting factor. The district should have the current hypochlorite treatment system analyzed to allow for future increase in production capacity.

The Guemes Avenue treatment and pumphouse has experienced leaking and a deterioration of the piping within the building in the past few years. Piping throughout the pumphouse should be assessed and a replacement program scheduled to ensure continued service throughout the system.

Replacement pipe should be designed to withstand the damp environment typically experienced in a pumphouse and treatment building. The Management and Operations manual should be updated to provide continued assessment and repair of deterioration of pipes.

As will be mentioned in control and telemetry need; while the Guemes Avenue reservoir is off-line the treatment system is bypassed due to the piping configuration which directs filtered water directly into the Guemes Avenue reservoir. An analysis should be performed to determine if a piping configuration can be developed to allow the treatment system to be in use while the Guemes Avenue reservoir is not in service.

3.5.3 Storage Needs

The existing reservoirs provides sufficient storage for the existing system demand. These reservoirs are projected to be adequate to serve the system through the projected 20-year planning period and are projected to provide at least 85% of the DOH-recommended standby storage. The only deficiency in the current storage is the ability to isolate storage to the Maple Point Reservoir. The means and methods of improving the functionality of these reservoir will be discussed under controls and telemetry systems.

The need for additional storage will be reevaluated when this plan is next updated.

3.5.4 Distribution Needs

Hydraulic modeling indicates that the current configuration of the booster pumps and size of the existing distribution system are adequate to meet the projected future peak hour demands through the years in the current projected planning period. The system can maintain the required minimum pressure of 30 psi throughout the distribution system as required by local Island County Code. A copy of the distribution system hydraulic model is in APPENDIX M. There are various deficiencies in the distribution system that are prioritized in this Water System Plan, they are:

Aging Water Mains:

The system has some older mains and a replacement program should be started to plan for the orderly replacement of the aging distribution piping. The District is building reserves to fund future water main replacement projects and should evaluate water rates and future funding sources as outlined in Chapter 9.

There is currently only one watermain servicing all the connections on Driftwood Drive. This watermain is over 3,500 linear feet and is at its expected lifespan. Leaks and failures along this line will interrupt

service to multiple connections in the system. An alternative means of looping the system down to Driftwood Drive should be installed in the initially planning phase so that the repair or replacement of the 6" AC pressure main down George Drive can be repaired and/or replaced in future phases. Water leaks and other concerns may necessitate the adjustment of the scheduling of these projects and the line down George Drive could be replaced adjacent to the exiting main in order to maintain service through the construction process.

Looping of the System:

There have been recent complaints from various consumers regarding discoloration of water following recent repairs that weren't satisfactorily addressed by flushing of the system. There are various dead-end mains that should ideally be looped with the existing system. The looping of the system is also applicable with the alternative of providing an additional source of water down to Driftwood Drive.

Exposed Piping:

There are 6-inch PVC water mains located in easements in the distribution system that are no longer buried and are susceptible to breaks from debris and impacts. These 6-inch watermains should be located throughout the system and prioritized for reburial or replacement as necessary.

Fire Flow Capacity:

Currently the system doesn't have fire hydrants located throughout the system in order to comply with Island County Code 13.03A.090. In addition there are various portions of the system with 2-inch and 4-inch transmission lines that lack the capacity to provide fire flow. Although the system doesn't currently have plans to expand, it would like to expand the ability of the system to serve structures with properly located fire hydrants. Currently, the northern portion of the system, north of Samish Court, has line sizes and hydrants placed in order to serve the structures in that portion of the system. The southern portion of the system, aside from George Drive, lacks the water main sizes to supply the necessary flow to supply hydrants.

Table 3-20 currently contains two projects that will directly improve the capabilities of the District to expand fire flow to the southern portions of the distribution system. Project 6 proposes the replacement and increasing of line sizes along Mitford Lane, Hubble Court, down to the northeastern end of Driftwood Drive back to George Drive with new 6" lines. Along with Project 10, the replacement of the 6" gravity main down George Drive, the system will expand fire flow to all structures along Mitford Lane, Hubble Court, Periwinkle Road, Pebble Ct, and portions of Driftwood Drive and Sand Dollar Lane.

The water mains down Fildalgo Drive, Orcas Drive, Lopez Drive, and southwestern portion of Driftwood Drive are not a near term priority for the distribution system due aging infrastructure in other portions of the current distribution system. However, a long-term project for the system is to provide fire flow in this portion of the system (See Project 17 in Table 3-20). See Table 3-20 for a full scope of the water capital improvement project priorities. APPENDIX O provides an inventory of the system and a 20-year budget for the capital improvement projects.

3.5.5 Control and Telemetry Needs

In 2000 a dedicated fill line with associated controls and electrical components were installed from the well field at Samish Court to the Guemes Avenue reservoir site. Currently the system is controlled via the Guemes Avenue reservoir level with the Maple Point reservoir/standpipe floating on the system. When the Guemes Avenue site is not in service the method to control the system with the level from the Maple Point reservoir/standpipe is complicated and inefficient. Additionally, the treatment has a

limited function while the Guemes Avenue reservoir is empty. The configuration of the treatment layout should be analyzed to ensure full functionality while the Guemes Reservoir is empty.

The configuration of the piping to the Maple Point reservoir should be analyzed to determine the most efficient method of using the Maple Point reservoir to control the system. Controls would need to be installed in the Maple Point reservoir and brought up to the Guemes Avenue pumphouse.

Board members have expressed interest in upgrading to a Supervisory Control and Data Acquisition (SCADA) system. With the assistance of their SMA the District should determine what functionality is desired and beneficial to the long-term management of the system and determine if the cost benefit exists for the investment in this addition.

3.5.6 Non-Facility Needs

The District is no longer using Well 1 as a source of water for the system. The existing water rights should be reviewed with an attorney and the DOE to verify that the District has adequate perfected and permitted water rights to meet the future systems anticipated needs and is making satisfactory progress on perfecting the permitted water rights. Adequate water rights are essential to ensuring the long-term viability of the system.

In addition, the District should have a detailed water rates analysis conducted to determine that most effective way to fund the long-term viability of the system. The following prioritized projects will be significant enough that future funding may be necessary to complete necessary projects.

Table 3-20 Prioritized Potential System Improvements Needs

#	Prioritization	Component	Description	Cost
1	Immediate	Distribution	Replace and repair of 6-inch PVC watermain that are no longer buried in the easement located west of Samish Court and south of Island Court (approx. 450-feet)	\$90,000
2	Immediate	Treatment/ Distribution	Replacement and repair of piping in the Guemes Pumphouse	\$40,000
3	Immediate	Distribution	Repair the connection between George Drive and Fidalgo Drive. Restore the functionality of the looping of this portion of the distribution system and prepare as-built drawings of the system.	\$5,000
4	Immediate	Distribution	Replace old water meters (with setter installed)	\$300 - \$500 per connection
5	Near Term	Treatment	Investigate the method for disposal of water used to flush the filter media and provide a long-term solution. The system currently irrigates a neighboring property to dispose of water used to flush the treatment facility	\$10,000

#	Prioritization	Component	Description	Cost
6	Near Term	Non-Facility	Investigate the transfer of Water Rights from Well 1 to Well 3 or to a new site.	\$10,000
7	Near Term	Distribution	Watermain to service Driftwood Drive via Hubble Court. Replace and increase 2" watermains along Mitford, Hubble, and Driftwood. Install a PRV station prior at the end of Hubble Ct.	\$400,000
8	Near Term	Non-Facility	Complete a Water Rates analysis to ensure proper funding to maintain the financial future of the Water District.	\$7,500
9	Near Term/ Medium Range	Treatment	Analysis of treatment system and replacement with adequate system.	\$50,000
10	Near Term/ Medium Range	Distribution	Complete the connection between Periwinkle Road and George Drive and loop the system with the necessary PRV station.	\$50,000
11	Medium Range	Distribution	Replace or rehabilitate the gravity 6" AC watermain for George Drive from Blakely Avenue to Driftwood Drive. (3,750 LF)	\$580,000
12	Medium Range	Distribution	Emergency generator to power well pumps.	\$10,000
13	Medium Range/ Long Range	Source	Dynamic and static analysis of Wells 2 and 3	\$25,000
14	Medium Range/ Long Range	Source	Alternative well analysis and development.	\$60,000
15	Long Range	Treatment/ Distribution	Evaluate and modify configuration of treatment system piping to allow continued use the treatment filters while the Guemes Reservoir is empty.	\$15,000
16	Long Range	Controls/ Distribution	Reconfiguration of piping and extension of controls to Maple Point Reservoir.	\$350,000
17	Long Range	Distribution	Watermain Replacement and hydrant additions on Lopez Dr, Orcas Dr, and Fidalgo Drive. (3,950 LF)	\$595,000
18	Budget Providing	Controls	SCADA System Installation	\$100,000

4 WATER USE EFFICIENCY PROGRAM AND WATER RESOURCE ANALYSIS

4.1 Water Use Efficiency and Water Loss Control Action Plan

The dramatic increase in population in Western Washington over the last few years has made it evident that even with abundant precipitation this area does not have an unlimited supply of water. This fact was demonstrated by the droughts during the summers of 1987, 1992 and 2002 when water supplies in some parts of Western Washington were drawn down to a critical point and mandatory consumer water conservation was implemented.

These events highlighted the need to establish measures for both short term emergency and long term systematic per capita water use reduction. The SHWD has consistently encouraged water conservation through a variety of methods and plans. These follow state legislated guidelines to do as much as possible to encourage more conservation.

A general mandate has been made by RCW 90.03.005, RCW 90.03.400, RCW 90.54.020 and RCW 90.54.180 for water use efficiencies in Washington State water systems. RCW 43.20.230 makes a specific directive to DOH to incorporate procedures and guidelines relating to the conservation of water during the approval procedures of system plans.

The SHWD recognizes that water is a valuable and essential natural resource that needs to be managed wisely. The main objectives of this water conservation program are:

- Increase awareness among water users of the importance of conserving water and of the methods available to achieve reductions in their water use.
- Reduce distribution system water loss to 10 percent or less.

The District's most recently available 3-year annual average (for 2016-2018) indicates a distribution system water loss of 13.6%. Because this exceeds the 10% objective SHWD has created a Water Loss Control Action Plan per WAC 246-290-820 to address the exceedance and create a plan for a reduction in water loss. Following are the basic elements of the Water Loss Control Action Plan to be implemented by SHWD. These items meet the intent of the Water Use Efficiency goals (WUE) and will be implemented to achieve the objectives stated above.

4.1.1 Water Loss Control Action Plan Summary

The District is required to establish a water use reduction goal through a public process. The action plan to be implemented by the district contains various aspects with the intent of obtaining accurate data, identifying real losses, and improving the system efficiency. The District will implement several water use efficiency measures which are covered in the following sections:

4.1.1.1 Accurate Data Collection – Water Metering

The District's sources are all metered. The source meters are read daily for the two current production wells. The meters are periodically tested and repaired or replaced, as needed.

The District requires the installation of water meters on all services. Meter readings are taken on a quarterly basis and are used to determine customer water use and charges. The replacement of old/outdated meters is an identified on-going upgrade recommend to assist in obtaining accurate data.

Currently only one of the meters serviced the community center is being read and assessed charges. The SHWD will begin reading the additional meters and service charges will be assessed as the District proceeds with implementing this plan. Funding for meter replacement is discussed in the Capital Improvement Program.

The Water System's metering system allows comparison of water pumped from Water System Wells to that used by customers. Discrepancies will be investigated by the operator as part of its on-going leak detection program.

4.1.1.2 Identifying Real Water Losses

The SHWD will perform a leak detection survey to assist in identifying locations of real loss within the distribution system in the next 5 years as they obtain additional funding from the recently paid loans. In the interim SHWD and its operator will use consumption histories and source data to locate existing areas of concern. In addition, SHWD will implement various items to propose an annual reduction in water usage.

4.1.1.3 Consumption History

The metering program also allows customers to see how their bill varies directly with their consumption and past activities. The District provides billing statements that allows customers to compare their current consumption to the same period in the previous year. This will allow customers to track their own conservation progress. It will also allow the Water System to monitor variations in per capita use for potential leak detection.

4.1.1.4 Water Rates

Flat rate structures and rates that decrease with increasing usage do not encourage water conservation. There is little financial incentive to use less water in such cases. Alternatively, increasing block rate structures can reduce water consumption

The District has established a consumption based increasing block rate structure that encourages water conservation by charging higher per unit rates after a specified consumption level is exceeded. Higher rates are only charged on the portion of consumption that exceeds the previous block. The current District water rates are discussed in more detail in Chapter 9. Chapter 9 recommends that the District have a rate study performed to determine the correct rate structure that will provide for the long-term financial viability of the distribution system. Additionally, Section 9.5.5 proposes an optional rate structure that can be employed while a more thorough rate structure is analyzed.

4.1.1.5 Leak Detection Program

Water lost through a utility's transmission and distribution system is typically referred to as "Distribution System Leakage (DSL)". A system audit compares the amount of water produced from the source to the amount of water sold to customers. The District performs a quarterly analysis of source water produced in comparison with water sold in order to detect increases in the DSL.

The District's leak detection program includes monitoring for leaks in the system and quickly repairing them when identified. The District promptly investigates any reports of leaks from customers and actively investigates aberrations in consumption by customers.

The District's most recently available 3-year annual average (for 2015-2017) indicates a distribution system water loss of 13.6%. Because this exceeds the 10% objective stated in Section 4.1, the District is advised to conduct a leak detection analysis of its system to identify and fix leaks. SHWD has also created a Water Loss Control Action Plan per WAC 246-290-820 to address the exceedance. This Water System Plan includes various projects to assess a reduce potential factors contributing the water loss in the distribution system including replacement of aging water lines and replacement of older meters that could no longer be functioning properly.

4.1.1.6 Water Pressure

The water pressure within the District is maintained between 50 and 65 psi by existing booster pump stations and pressure reducing valves. This pressure range ensures adequate operation pressure while minimizing water loss through over-pressurized services.

4.1.1.7 Flushing Mains

A portion of the routine maintenance performed on the system is to periodically flush the distribution system. A certain amount of silt and organic debris accumulates in the system which must be flushed out on a regular basis. Estimates on the amount of water used during flushing operations will be used to determine the DSL rate.

4.1.1.8 Informal Messages

The District will include informational brochures and/or letters on the need for conservation with customer billing statements on occasion. The District billing statements will also include periodic messages encouraging conservation. Examples of messages include:

- Conserving Water Saves Money!!!!
- Water your lawn wisely & save \$
- Use Lawn Watering Calendar!!!!
- A Shower = 5-7 gallons per minute
- Use your broom to clean, not a hose.

The District will relay information about upcoming water conservation speakers or meetings to their customers. The District will strive to schedule speakers annually for a monthly membership meeting to discuss water conservation measures and benefits.

The District will capitalize on studies conducted by larger water systems such as the Snohomish County PUD and the City of Everett and the Washington Department of Health. These studies will be used to evaluate the latest water conservation techniques. These techniques will be analyzed for their applicability to the District's water system and how they may best be implemented.

4.1.1.9 Plumbing Fixture Replacement

The District, through the attachment of informational literature to the customer billing statement, can encourage the use of low water use fixtures in homes. It also plans to provide new customers with informational materials on water saving plumbing.

4.1.1.10 Water Use for Landscaping

Lawn and landscape watering are the largest uses of water during the summer months. Education on the amount of water needed to sustain healthy plant life is an effective conservation tool. The District plans to provide customers with literature on lawn watering during the spring of each year. The District also plans to distribute literature offering recommendations for establishing a water conserving landscape. A listing of drought tolerant plants will be provided along with suggestions for plant placement and watering.

The District has also established rate structure that encourages prudent use of water in the yard and garden.

4.1.1.11 Goals

The District has two major goals with their conservation program: further reduction in distribution system leakage and the reduction of the growth adjusted annual peak season demand. The latter may be seen through a public education program to promote awareness and educate people how to reduce seasonal peak demands. The District will also include conservation ideas in future articles in the annual Water Quality Report. The District's conservation goal over the next five year is to decrease the adjusted annual peak season demand by one percent each year and reduce system water loss to below 10%.

4.2 Source of Supply Analysis

The Department of Ecology requires water systems to demonstrate serious consideration of all options prior to issuing new or expanded water rights. The purpose of a supply analysis is to evaluate opportunities to obtain or optimize the use of existing sources already developed and evaluate other innovative methods to meet water needs.

A source of supply analysis is required of all systems that will be pursuing water rights within 20 years of approval of their WSP as defined by the water demand forecast. The Scatchet Head Water District has adequate water rights at this time and is not projected to require additional rights within the 20-year planning period. Systems that are not pursuing additional water rights are also encouraged to conduct a source of supply analysis; however, it is not required.

4.2.1 Enhanced Conservation Measure

As discussed in Section 4.1, the District has or will implement use efficiency measures with the goal of reducing MDD and ADD system-wide.

4.2.2 Water Rights Changes

As further discussed in Section 4.3, the District is not projected to pursue additional water rights within the six-year planning period. Therefore, no changes in water rights are foreseen.

4.2.3 Interties

The system has no current interties. Interties may be a cost-effective way or providing system redundancy in the event of line break or source production issues. An intertie with another water purveyor would only be considered if:

- The water quality meets State/Federal water quality standards, and
- The water chemistry is compatible with the existing water quality of the system, and
- The hydraulic grade is higher than the Water System's or can feasibly/economically be boosted as necessary, and
- The system has adequate capacity to support the intertie, and
- Both systems are able to maintain compliance with their water rights.

Currently there are no other known water systems in the vicinity of SHWD that have the capacity and hydraulic grade necessary to effectively create an intertie. A more thorough analysis of potential interties is beyond the scope of this planning document. If discussions with neighboring systems are fruitful and mutually acceptable then a study and project report will be generated for future intertie projects.

4.3 Water Right Evaluation

The following sections summarize the District’s water right evaluation.

4.3.1 Existing Water Rights

Currently, the District has two water rights that describe withdrawal points from a groundwater. The Certificates of Water Rights is included in APPENDIX F. The water rights for the District are summarized in Table 4-1.

Table 4-1 Water Right Documents

Groundwater				
Source	WRIS No.	Annual Volume (Q _a)	Instantaneous Flowrate (Q _i)	Priority Date
Well 1 ¹	G1-20574	101	90 gpm	4/27/1973
Well 2	G1-23621	140.4	125 gpm	6/11/1980
Well 3 ²	---	---	---	---
Groundwater Total		241.5 af/y*	215 gpm**	

1-This well has been abandoned

2-This well operates under the water right from well 2.

4.3.2 Existing Water Rights

The table for “Water Rights Self-Assessment Form for Water System Plan” provided by the Washington State Department of Health has been completed and is included in APPENDIX I.

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5 SOURCE WATER PROTECTION

5.1 Introduction

Protection of the source of the water supply is of utmost concern for public water systems. The District's two production wells have been free of man-made contaminants. The sources are completed in relatively deep aquifers, covered by many layers of glacial tills. The glacial till layers slow the transport of potential contaminants and allow for the natural degradation of these possible contaminants.

5.2 Wellhead Protection Program

The District will implement a wellhead protection program. The District's well head protection will incorporate the following:

- Periodic monitoring of the existing wells for nitrates and conductivity to check for any sudden change in water quality
- Sending informational flyers out to water customers outlining proper storage and use of common household chemicals, yard and lawn fertilizers, pesticides and herbicides.
- Posting signs identifying the system source pollution control zones.
- Providing letters to property owners within the capture zones regarding the presence of the system source wells

The Water System's source water is from groundwater wells. The wells physical parameters are discussed in 3.3.1. The Water System's Wellhead Protection Program is attached in APPENDIX J.

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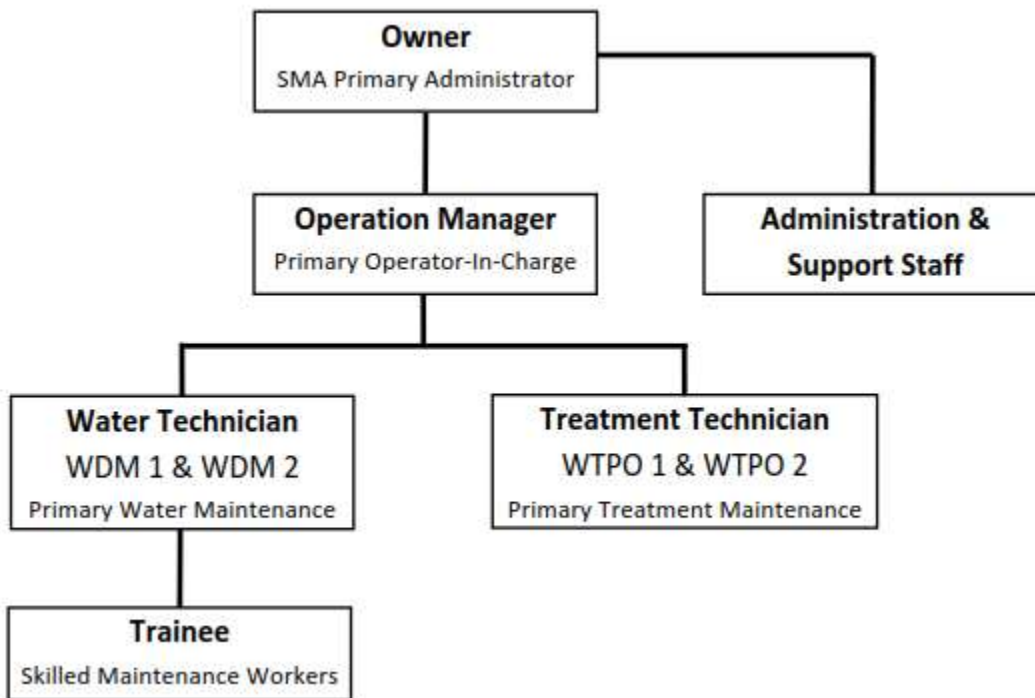
6 OPERATION AND MAINTENANCE PROGRAM

The Water District's Operation and Maintenance Program Manual (O&M Manual) is intended to be used as a standalone document. A copy of the O&M Manual shall be maintained in the office located at the pumphouse and treatment building on Guemes Avenue. The O&M Manual includes pertinent contact information, worksheets, and operational procedures. The O&M Manual also includes the Water Shortage Plan, Emergency Response Plan, and the Cross-Connection Control Plan.

6.1 Water System Management and Personnel

The Water District has contracted with King Water Management Services (King Water) as the system operator. King Water is a Washington State Certified Satellite Management Agency (SMA). Figure 6-1 shows the overall structure for the water system operator.

Figure 6-1 Water System Staff Certifications



6.2 Operator Certification

The duties of certified waterworks operators are defined in WAC 246-292. Table 6-1 lists the titles and certifications for positions in water system staff. Staff should continually maintain certifications through continuing education as required by each individual certification.

Table 6-1 Water System Staff Certifications

Position	Certifications
Owner	WTPO 2, WDM 2
Operations Manager	WTPO 2, WDM 2
Technician I	WDM 2, WTPO 1
Technician II	WDM 1, WTPO 1
Technician III	WDM 1
Trainee	none

6.2.1 Role of the Satellite Management Agency

The Satellite Management Agency (SMAs) must be authorized by the Department of Health manage and operate public water systems. The SMA will be tasked with the standard operations and maintenance of the distribution system including:

- Routine Service calls (at least 3 times per week).
- Maintain the pump house logs documentation for all activities.
- Regular inspections of the distribution system for leaks.
- Water usage monitoring during each visit.
- Monthly reports regarding water production and usage.
- Implementation of the District’s preventative maintenance programs.
- Water Quality Monitoring and Testing.
- Maintaining and operating the distribution system’s treatment system.
- Emergency response for the distribution system (24-hours per day).
- Regular monitoring of pumping rates and system pressures.
- Maintaining system documentation, testing results, and compliance with state and local regulations.
- Response to and handling of customer complaints.
- Coordination of any specialized needs for the system as approve by the District. Including arrangements with independent contractors.
- All necessary billing and administrative services. Including payroll, tax documentation, customer billing, bill collection, etc.

The contract with the SMA should, at a minimum, include the above services. A copy of the current contract with King Water is included in APPENDIX A.

6.3 Routine Operating Procedures and Preventative Maintenance

Periodic maintenance of all components of the community water system is necessary to ensure continuous, uninterrupted service. General maintenance of many items may include checking set-points, security and screens, painting exposed surfaces, lubricating moving parts, cleaning, rebuilding, and assessing overall operation for major repairs or replacement. Such maintenance should involve a minimum of the following:

- All valves should be periodically operated to ensure proper working order and a record kept on each valve.
- The reservoir should be checked daily for water level, along with the functioning of probes or level indicators.
- Fire hydrants should be maintained each year and a record kept on each hydrant.
- A continuous lookout for water system leaks should be made and a record of leaks maintained.

- Chemical and bacteriological samples should be properly collected analyzed, and the results submitted to the WSDOH.
- As-Built records should be kept on each water line in the system.
- The supply source meters should be read and recorded each day.
- The well supply pump and booster pump meters should be read and recorded each day. In addition, the pump facilities should be checked at least weekly and the pumps and motors inspected and maintained in accordance with the manufacturer's recommendations. All electrical contacts in the pump control systems should be tightened once a year.
- Water service meters should be maintained, repaired, and replaced as needed to protect water revenues.
- An annual inspection of all existing backflow prevention devices should be conducted and periodically surveyed to determine the need for replacement or new installations.
- Dead-end mains are flushed every three months.

If the purveyor has received approval of a comprehensive plan or abbreviated water system plan by the Department of Health and has submitted and received approval of standard construction specifications, then detailed plans and specifications for distribution mains need not be submitted individually for approval. If such approval is obtained, only alterations to the plan need be submitted to the Department.

The WSDOH also requires bacteriological samples to be taken and that chemical analyses of the District's supply sources be made often enough to assure compliance. Table 6-2 summarizes water quality requirements. It's good practice to have paper cards on file or an electronic database with information that includes the type of meter and its serial number, date of installation, and maintenance performed. In addition, operators have found that a Service Record for each resident is valuable in maintaining a complete system record. This record can be valuable when attempting to repair or locate service lines, or when attempting to see if breakage or leaks follow a pattern.

Table 6-2 Groundwater Quality Requirements

Contaminant	Criterion	
	Quantity	Units
Primary Contaminants		
Barium	1.0	mg/ltr
Cadmium	0.01	mg/ltr
Chromium	0.05	mg/ltr
Lead	0.05	mg/ltr
Mercury	0.002	mg/ltr
Selenium	0.01	mg/ltr
Silver	0.05	mg/ltr
Fluoride	4	mg/ltr
Nitrate (as N)	10	mg/ltr
Endrin	0.0002	mg/ltr
Methoxychlor	0.1	mg/ltr
1,1,1-Trichloroethane	0.20	mg/ltr
2-4 D	0.10	mg/ltr
2,4,5-TP Silvex	0.01	mg/ltr
Total Coliform Bacteria	1/100	ml
Secondary Contaminants		

Copper	1.0	mg/ltr
Iron	0.30	mg/ltr
Manganese	0.05	mg/ltr
Zinc	5.0	mg/ltr
Chloride	250	mg/ltr
Sulfate	250	mg/ltr
Total Dissolved Solids	500	mg/ltr
Foaming Agents	0.5	mg/ltr
pH	6.5 – 6.8	
Color	15	Color Unites
Odor	3	Threshold Odor Units

6.4 Water Quality Sampling Procedures & Program

The Water Quality Monitoring requirements are set forth in WAC 246-290-300 and were discussed in Chapter 4 of this plan. The regulations cover sampling frequencies for bacteriological, inorganic chemical and organic chemical samples as well as radionuclides, volatile organic compounds (VOC), and secondary chemical and physical contaminants.

Samples must be analyzed in laboratories approved by the WSDOH. A minimum of one bacteriological sample per month is required. With a groundwater supply one inorganic chemical sample is required every three years. Organic and VOC samples are necessary only when required by the Department. Radionuclides must be sampled during four consecutive quarters, once every four years. Sampling for secondary chemical and physical contaminants must occur once every three years.

The MCL's for the various substances are listed in Section 3.1.1. If these levels are exceeded at any time, the procedures below are required. (These procedures are described in more detail in the State Board of Health Drinking Water Regulations).

6.4.1 Routine Monitoring of Bacteriology

The Water District should follow the Source Water Chemical Sampling Schedule prepared for its use by the Department of Health. Bacteriological samples will be collected in accordance with the Coliform Monitoring Plan included in the Management and Operations Manual for the District.

6.4.2 Required Steps for MCL Exceedance

Inorganic and Physical: If a primary MCL is exceeded the WSDOH shall be notified within 48 hours and corrective action taken. The public shall also be notified. If a secondary MCL is exceeded the WSDOH shall be notified and corrective action taken. For parameters exceeding secondary MCLs public notification is left to the discretion of the WSDOH.

Radionuclides: When the average of all samples taken during the 12-month period exceeds the MCL, the WSDOH shall be notified within 48 hours. Public notification is also required.

Volatile Organic Chemicals: Notify the WSDOH within fourteen days of receipt of test results showing an exceeded MCL. The public shall be notified per WAC 246-290-330, including mandatory health effects language. Public notification must be provided when a primary maximum contaminant level is exceeded and should consist of the following four items

6.5 Coliform Monitoring Program

All Group A public water systems are required to develop a written monitoring plan and to collect samples according to the plan. The plan consists of a map of sampling locations and a description of sampling procedures. The WSDOH has put together two manuals; "Preparation of a Coliform Monitoring Plan" and "Coliform Monitoring." These manuals provide guidance for preparation of a monitoring plan. For a water system of the District's size two minimum monthly routine coliform samples are required. The samples must be received and analyzed by a laboratory within 30 hours from the time collected. When any sample results in a coliform presence, a "set" of repeat samples must be collected within 24 hours of notification. For a system that collects two routine samples per month, three repeat samples are required. The following procedure should be followed in collecting the three repeat samples:

- Collect the first "repeat" sample from the same location as the previous coliform presence sample was taken.
- Collect a second "repeat" sample at a site within five service connections in either direction down the distribution pipeline from the previously mentioned coliform presence location.
- Collect a third "repeat" sample from a site within five service connections down the distribution pipeline the opposite direction (starting from the previously mentioned coliform presence location)

6.6 Emergency Program

The ability of a water system to sustain operations during emergency events and/or respond to emergency situations is important. The goal is to quickly react to emergency conditions, adjust the system to maintain safe and adequate service to the greatest extent feasible, and to return the system to entirely normal operations as rapidly as possible. Depending upon the nature and severity of an emergency event, certain components of the system are going to become most vulnerable and subject to failure in performing their primary function. This plan addresses the operation of the system under such conditions. The District must also be prepared to notify the potentially affected public if an emergency arises. Depending upon the urgency, the affected public may be notified through any of one or a combination of methods such as the following:

- Posted notices at publicly visible locations.
- Public notices in newspapers circulating in the local vicinity.
- Announcements over local radio and television stations.
- Police loudspeaker - roaming system.
- Door-to-door delivery of announcements and personal contact.
- E-mail to community residents
- Via the District's website: www.sh-wd.org

All announcements should inform the public what situation has occurred, what intermediate measures must be taken by them (i.e., conservation methods, where to go for water, or what to do with their water prior to consumption) and when they can expect to see the system return to normal operation.

In the case of an emergency, notify the District's Water System Management Company: King Water Management Services. If there is an outage over 24-hours in duration notify the Northwest Drinking Water Operations Office of the WSDOH. In case of emergency the WSDOH may order the SHWD to provide notification by newspaper and to radio and television stations where such notice is required to protect the public health. The SHWD shall keep detailed and complete records of all public notification occurrences as to document compliance with this section.

Table 6-3 Emergency Contact List

Emergency Contact	Contact Information
Sandra Bodamer, System Operator King Water Management Services	Office: 360-207-3171
Scatchet Head Board of Commissioners - Dave Mullins - Scott Carr - Jaquelin Guyette	Commissioner Email addresses: - dave.mullins10@gmail.com - shwdcarr@gmail.com - Jackie_Guyette@hotmail.com
Whidbey Telecom 24-Hour Repair Services	360-321-8324
Buried Cable Locations	1-800-424-5555
Robert Bennion, PE	Office: 360-331-4131 ext. 206
WSDOH After Hours Hotline	1-877-481-4901
WSDOE Spill Response	1-800-424-8802
Island County Public Health	360-221-8880
Fire/Police/Medical Emergencies	911

6.7 Sanitary Survey Findings

The latest sanitary survey of the water system was performed by WSDOH on May 19, 2015. A copy of the survey is included in APPENDIX Q. The sanitary survey noted the following findings:

- Significant Deficiency – Install screens to the air inlet of the well 2 mazzei injector.
- Significant Finding – Provide pictures on the reservoir hatches showing the hatch structure and seal and vents showing the vents structure and screening. Also, provide pictures on any other openings on top of the reservoir to demonstrate them adequately protected.

Both items were to be addressed by July 24, 2015. In addition to these deficiencies and findings, the survey provides many observations and recommendations that have been and should be incorporated into the system. The following observations were identified by the WSDOH:

- The overflow of the 300K tank appeared to have a PVC solid cap on it. This should have a screen, flapper valve, or something else that would provide sanitary protection of the reservoir but would also allow flow if needed.
- Install screens to the outlets of the air-vacuum release valves in the pump house.
- Fix the leak at the backwash discharge line at the backwash bond.
- The 300K standpipe at the treatment plant site is in need of structural inspection and external painting. The surface showed rust spots. Please hire professionals to inspect the reservoir and evaluate the level of work that is needed to sustain the reservoir in use.
- Develop and implement a cross connection control program. Start by making sure you have the authority established for implementing the program, then complete a hazards assessment, create a list of installed devices, ensure adequate protection is installed, and that the installed devices are tested annually as required.
- Treatment bypass should not exist. While only the chlorination is required, the treatment that has been installed is required to remain in use. You should lock and tag the bypass valve to avoid inadvertent bypassing of the treatment

Additionally, the following recommendations were provided by the WSDOH:

- You should add a pressure relief valve near the hydropneumatic tank at the pump station to protect from over-pressurization. The small valve included in the pump station piping did not appear adequate for the size of the tank.
- While this system is required to continue quarterly monitoring of arsenic at the entry point to the distribution system, you should consider taking monthly samples when the high-arsenic source is in use to demonstrate the blending is efficient mitigation method.
- Revise the monthly report submitted to our office to accurately reflect the monitoring completed at the system.
- During the site visit, the backwash water appeared very clear. You should investigate if the backwash flow rate is adequate or if the frequency could be reduced.
- You should start long-range planning of the water system, especially considering the age of your assets and their replacement value. You should update your water system plan to make sure it provides you a useful tool in managing the assets and other aspects of your water system.
- We would like you to complete an online capacity assessment survey. The assessment includes 18 questions about your system. When you complete the online assessment, you'll get immediate feedback that provides tips and resources for improvement. We are using information from the assessment to target our limited technical assistance resources where we think they will be most beneficial. You can find the assessment at www.doh.wa.gov/capacityassessment.aspx.

Items that haven't been addressed are identified and prioritized in Section 8 of this report.

6.8 Cross-Connection Control Program

The Scatchet Head Water District has previously developed a cross-connection control program as required under WAC 246-290-100 as outlined under WAC 246-290-490. A copy of the Cross-Connection Control Program is included in APPENDIX K.

The District's responsibility for cross-connection control shall begin with its water supply sources, include all District water treatment, storage, and distribution facilities, and end at the point of delivery to each customer's water system, which is the water meter. The District's plan is outlined below.

6.8.1 Procedures for Hazard Evaluations

As a condition of new connections to the water system, an initial evaluation to assess the degree of cross-connection hazard posed by the consumer's premises to the District's distribution system shall be conducted by the District. The District shall determine the method of backflow protection required, if any. The required method of backflow protection shall be installed and a satisfactory qualified test by a qualified backflow assembly tester shall be provided by the consumer to the District before water service is provided.

As a condition of continued water service, annual evaluation should be conducted on existing connections with water use characteristics of premises with water uses that pose potential hazardous cross-connection conditions to the District's distribution system. These potential uses can include, but are limited to:

- Outdoor Pools
- Livestock storage
- Sprinkler systems
- Premises with heat exchangers and/or solar potable hot water systems
- Premises with fire systems using chemicals

As a condition of continued water service, the district will evaluate connections that have had a potential change in use.

6.8.2 *Eliminating or Controlling Cross-Connections*

When cross-connections cannot be eliminated they shall be controlled by installation of approved backflow prevention devices commensurate with the degree of hazard.

The District's Cross-Connection Control Program shall consist of premises isolation at or near the service connection or an alternative location acceptable to the District between the service connection and the first point of any hazard. The District shall ensure that an approved reduced pressure backflow assembly (or reduced pressure detector assembly) is installed for all premises posing a high degree of cross-connection hazard, including those listed in Section 6.8.1.

The District shall require at a minimum, double check valve assembly (or double check detector assembly) installed in accordance with WAC 51-46-0603 of the UPC for premises posing a low degree of cross-connection hazards.

The District prohibits interconnection of any private water supply with the District's distribution system. The District's policy requires that the owner of property or any person residing thereon receiving water service from the District shall not connect, directly or indirectly, the water service line or any part of the plumbing of such structure receiving water service from District with any other water source, water system, plumbing or any utility line whatsoever.

6.8.3 *Backflow Preventer Inspection, Testing, and Repairs*

All backflow prevention assemblies are subject to annual inspection and testing by a Department of Health certified backflow assembly tester.

As a condition of continued water service, customers shall make their premises, to which water is supplied, accessible to a state certified backflow assembly tester for inspection and testing annually to determine whether backflow prevention assemblies are properly installed, maintained and are operational. The District may deny or discontinue water service to any customer failing to cooperate in the installation, inspection, testing, maintenance or repair of approved backflow prevention devised pursuant to WAC 246-290-490.

The District will promptly notify property owners with known potential cross-connections. The District shall also notify on an annual basis all customers having approved backflow prevention devices of the need for an annual inspection.

6.8.4 *Quality Assurance Program*

The District shall require backflow prevention assemblies be models included on the current list, of backflow prevention assemblies approved for use in Washington State. The District may allow testable backflow prevention assemblies that are not on the current list of backflow prevention assemblies approved for use in Washington State if the following applies.

Existing backflow prevention assemblies installed on the system not on the current list of backflow prevention assemblies approved for use in Washington State may be allowed by the District if the following applies:

- The backflow prevention assembly was included on the list of backflow prevention assemblies approved for use in Washington State and/or Uniform Building Code list of approved backflow prevention assemblies at the time of installation;

- The backflow prevention assembly has been properly maintained;
- The backflow prevention assembly is commensurate with the District's assessed degree of hazard as determined by the District in its sole discretion; and
- The backflow prevention assembly has been inspected and tested annually and has successfully passed the annual tests.

The District shall require that an unlisted backflow prevention assembly be replaced by an approved assembly commensurate with the degree of hazard, when the unlisted assembly:

- Is moved; or
- Cannot be repaired using spare parts from the original manufacturer.

6.8.5 Responding to Backflow Incidents

In the case of a backflow incident in the District's distribution system; the District's water system administrator shall notify the Board of Commissioners and the local Department of Health as soon as possible, but no later than the end of the next business day, when a backflow incident is known by the to have:

- Contaminated the District's public water system.
- Occurred within the premises of a customer served by the District.

6.9 Record Keeping and Reporting

Record keeping and reporting requirements are given in WAC 246-290-480 for all public water systems. All files are retained at the offices of the SMA, King Water Management Services. Customer Complaints are maintained by King Water and are brought to the monthly meetings of the elected SHWD board for review.

6.10 Summary of O&M Deficiencies

The District continually strives to improve O&M procedures. Currently there are no specific improvements planned that need to be addressed at this time.

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7 DISTRIBUTION FACILITIES DESIGN AND CONSTRUCTION STANDARDS

7.1 Introduction

The Water District's design and construction standards are attached as APPENDIX N. The Scatchet Head Water District is requesting continuation of the design submittal exception for distribution projects. Project plans initiated by developers for extensions or other infrastructure improvements will be reviewed by the SHWD and their engineer to ensure the proposed plans meet the water systems goals for future growth and are consistent with the water system plan. Main replacement plans initiated by the system will be designed to comply with the above requirements.

Upon project completion, record drawings sealed by an engineer licensed in Washington State and Construction Certification Forms will be completed by the design/project engineer. The drawings and forms will be submitted to DOH and to the SHWD.

King Water Management Services has the overall responsibility for ensuring the proper operation and maintenance of the water system. Outside parties performing work on the District's Water System must provide prior notification to King Water of any construction or repairs. King Water Services must receive a copy of a passing bacteriologic sample prior to any system component, water service or main being placed into service.

7.2 Facility Improvement Policies

All new water service applications should follow The District's Adopted Policies and Procedures.

The required steps for implementation are as follows:

1. Water service desired by property owner or developer.
2. Applicant completes Water Service Application form and submits to SHWD.
3. District reviews application and determines if water main extension is required:
 - a. If main is needed go to step 4.
 - b. If no extension required go to step 11
4. The applicant then is subject to the Facility Improvement and Extension Policy and completes and executes the Facility Extension Contract and pays a retainer for engineering review services.
5. The Applicant selects the licensed professional engineer for preparation of plans.
6. The water main extension plans are prepared in accordance with the District's Construction Standards.
7. The District's Engineer reviews the Plans. The Engineer makes recommendations for acceptance to the SHWD Board.
8. The Applicant selects contractor and submits name with references to the Board for review. The Applicant and Contractor sign the Contractor Agreement.
9. New water main extension construction performed.
10. At the end of construction, a Bill of Sale and Recovery Contract (if any) are signed, and the Board transmits the letter of terms and conditions.
11. Applicant signs relevant District agreements, pays meter and hookup fees
12. The final connection of water service is made

7.3 Construction and Design Standards

The SHWD has adopted previous technical specifications which are included in APPENDIX N. Any construction or design plans should abide by those standards. Any items not directly addressed by the technical specifications should comply with the current edition of the “Standard Specifications for Road, Bridge and Municipal Construction” as prepared by APWA and the WSDOT. New facility designs shall be in accordance with Island County, WSDOH, and the referenced specifications.

7.3.1 Scheduled Improvements

Improvements that have been identified in the Water Plan will be prepared by a Washington State licensed professional engineer and include construction plans, specifications, and a cost estimate. No WSDOH review is required for water main construction and/or improvement that are listed in an Approved WSP. WSDOH review is required, however, for water storage, pumping, and/or water treatment facilities and other improvements.

7.3.2 Unscheduled Improvements

Improvements that have not been identified in the Water Plan will be prepared as outlined above for Scheduled Improvements and will all require WSDOH review.

Payment of the WSDOH review fees and expenses will be the developer’s responsibility when the developer initiates water system improvements. After construction is complete, and accepted by the District, the District will submit the following to the WSDOH:

- Certification by the professional engineer of record that construction complied with the District’s Standards, State standards, and any additional requirements developed during review.
- Documentation of the passing pressure tests, disinfection procedures, coliform test and water quality sample results must be obtained before placing the new main into service.

7.4 Performance Standards

The Scatchet Head Water District performance standards are as follows:

- Flow – Meet peak hour demands (PHD) with pipeline velocities less than 8 feet/second.
- Pressure – Minimum 30 psi at peak hour, max 90 psi at minimum demand period.
- Fire Flow – Residential service 1,000 gpm for one-hour duration, sustain distribution main residual pressures with 20-psi minimum residual, with pipeline velocities less than 10 fps.

Water Mains – Minimum 6-inch diameter. Fire hydrants with single pumper port, 2-1/2-inch hose ports, 5-inch minimum valve opening. Provide hydrant markings as specified in NFPA 291 – Chapter 2. Out of service fire hydrants shall be marked by bagging. When existing water mains are replaced, replacement mains shall be sized to meet minimum fire flow requirements of the Island County Code.

7.5 Construction Procedures

New Developer construction will be carried out according to the following procedures:

- Design Review: All construction plans and specifications will be reviewed by the District’s Engineer prior to release for construction. If WSDOH review is required, the developer must obtain review and approval before construction may begin.

- **Construction:** Inspection may be required by the District, to be provided at the developers cost. Inspections shall be conducted utilizing qualified inspector personnel using either county staff, members of the District's consultant engineer, or other technical staff approved by the SHWD.
- **Flushing, Pressure Testing, and Water Quality:** Testing and water main tie-ins will be performed under the supervision of District staff, it's SMA, or the District's consultant engineer. Upon approval by the District, the new facility shall be put in service.
- **Record Drawings:** Record drawings are required with field revisions noted on the documents. Record Drawings will be prepared on bond paper and signed and dated by the Engineer of Record. Signed drawings and a copy of the AutoCAD drawings will be conveyed to the District.

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8 IMPROVEMENT PROGRAM

The purpose of this chapter is to incorporate the District's needs previously identified in other chapters into an improvement program. The capital improvement plan (CIP) presented in this chapter has been developed in accordance with the requirements identified in WAC 246-290-100.

The development of a comprehensive plan and an improvement program provide for orderly maintenance and improvement of the District's distribution system. The population and water demand forecasts and the existing system analyses, which were discussed in previous chapters, were used to formulate the following Capital Improvement Plan. The District's design criteria were also included in the formation of the plan.

The existing piping system was also reviewed to determine the necessity of replacing older water mains. Considerations included material condition, size and capacity. The following sections summarize the Scatchet Head Water District's Improvement Program which is organized in two basic elements; 1) Prioritizing Improvements Projects, and 2) Improvement Schedule.

Planning Phase 1 (6 years; 2020 - 2026)

The Scatchet Head Water District currently has 410 active connections according to documents from the Department of Health. It is anticipated that the system will serve approximately 425 connections by the end of 2026. Based on the approved capacity exceeding the anticipated needs, no specific infrastructure improvements are required during this planning horizon. The District does have projects to address routing and redundancy needs that have been identified. It will be necessary to provide an additional source of water to the Driftwood Drive residences to address necessary watermain replacement in future phases. Other capital projects will consist of maintenance, repair and replacement of the existing facilities, and providing additional source capacity by identifying a potential location for an additional source of water for the system and transferring of water rights from Well 1. The system should also start putting monies aside to address necessary repairs to aging infrastructure in this and future phases.

Planning Phase 2 (20 year horizon; 2026 - 2040)

It is anticipated that the SHWD will potentially reach approximately 455 connections over the next 20-year planning period. It is anticipated that the existing AC water mains will require replacement during this planning horizon. In Phase 2 of the planning cycle (2026-2040), the water system will continue to investigate the development or complete the development of additional water source(s) as the existing sources will have been in place for 50+ years. In addition, replacing/upgrading the distribution system is anticipated to be a priority. Due to the large costs associated with main replacement it is important to initiate the financial plans in Phase 1 that will enable these projects to be completed during Phase 2. The CIP will be re-evaluated during future WSP updates and the CIP can be adjusted at that time.

Planning Phase 3 (20+ years, 2040 and beyond)

The anticipated maximum number of connections that can be serviced by the district is area is estimated around 559 connections. No projection is made in this report as to when build-out will occur. The primary challenge in this phase may be developing additional sources of supply. In Phase 3, replacement/upgrade of the remaining distribution system is anticipated.

8.1 Prioritizing Projects

A three-step process was used to develop the Community's Capital Improvement Plan (CIP). Steps include identification of potential system improvements, evaluation of the alternatives and selection of alternatives. Potential system improvements/needs are identified in Section 3.5 and summarized in

Table 3-20. This Section summarizes projects addressing the potential system improvements/needs, assessment of the improvements alternatives, and selection of improvements.

8.2 Identification of System Improvements Projects

Section 3.5 identifies the potential system needs categorized by system functional group (or component). Each aspect of the water system was analyzed, and a draft list of potential improvements was developed to address existing or anticipated system deficiencies. When applicable, alternative improvements were developed for each deficiency. The alternatives were determined in consideration of meeting DOH and District standards, improving reliability of the water system and minimizing capital and operating costs. The following sections summarize potential improvement projects addressing the needs in the system functional groups.

8.2.1 Source

Two source needs are identified for continued system growth and to provide redundancy within the system. These include the evaluation of locations for an alternative well site. In conjunction with this analysis a analysis for Wells 2 and 3 should be performed to determine any deterioration in capacity. This includes optimizing the installed treatment and/or installing additional treatment or refurbishing Well #1 to return this Source into service.

Analysis of Wells 2 and 3 – Current Planning Period

Well 2 was constructed in 1980 and a new pump was installed in the well during improvements performed in 1999. Well 3 was installed in 1995. Currently both well are functioning properly but a static and dynamic water level analysis should be performed to determine if there has been a deterioration in the capacity of either well.

Alternative Well Analysis – Future Planning Period

Wells 2 and 3 are both located on the same parcel of property owned by the Scatchet Head Water District. Presently Well 3 does not have a separate water right associated with it. The Department of Health approved the connection of Well 3 as a second point of withdrawal to Well 2. Thus, the total withdrawal cannot exceed the water right of 125 gpm associated with Well 2. Currently Well 2 must be throttled and not used concurrently with Well 3. An alternative located of a well should be evaluated that would provide an additional water right that could potentially be transferred over from the abandoned Well 1.

Emergency Generator for Well Field – Current Planning Period

When the pumphouse at the Guemes Avenue Reservoir site was installed, emergency generators were installed to power the booster pumps during power outages. The system has sufficient storage to serve the distribution system for a period of time, but extended power outages raise concerns regarding the ability to provide additional source water to the system. A generator should be installed to allow the wells to be active in case of an extended power outage. The generator switch should meet all applicable electrical codes. The generator fuel supply should meet all applicable codes and especially spill control measures in the vicinity of the well field.

8.2.2 Treatment

The SHWD's filtration facility improves the quality of the water distributed to the District by reducing the content of iron and manganese that exists in the raw source water. The on-site hypochlorite generation injection system currently provides sufficient disinfection and has capacity to meet the current demands through the initial planning period. However, if production is increased from Well 3 the treatment system would be the limiting factor. The district should have a current hypochlorite treatment system analyzed to allow for future increase in production capacity.

Treatment System Functionality and Capacity Analysis – Current Planning Period

The capacity of the treatment system should be analyzed to ensure it has capacity to meet future demand on the system. The hypochlorite treatment system was originally installed in 1997 and 1998 to address iron and manganese levels from the well field. Due to continued problems with management of disinfection and chlorine residual values an ozone treatment facility was designed but never installed. In 2001 a post-filtration hypochlorination was added to the system in order to increase chlorine residuals at the far extents of the system. This system should be evaluated to ensure efficacy and efficiency.

Pumphouse Treatment Building Piping – Current Planning Period

While the Guemes Avenue treatment and pumphouse has experienced leaking and a deterioration of the piping within the building in the past few years. Piping throughout the pumphouse should be assessed and a replacement program scheduled to ensure continued service throughout the system. Replacement pipe should be designed to withstand the damp environment typically experienced in a pumphouse and treatment building. The Management and Operations manual should be updated to provide continued assessment and repair of deterioration of pipes.

Treatment System Backflush Water Disposal – Current Planning Period

Currently the system disposed of water used to backflush treatment media by irrigating a neighboring property. This method has proved to be inefficient during the wet seasons of the year. At some point in the past a treatment swale was abandoned due to impacts to downstream properties. A method for proper treatment and disposal of water used to flush the filter media should be investigated and designed to provide a long-term solution for the District.

Treatment System Piping Configuration – Future Planning Period

While the Guemes Avenue reservoir was off-line for repair and recoating in 2018, the system was able to be served temporarily by the Maple Point reservoir, but it was necessary to by-pass the treatment system due to the piping configuration. The current configuration of the reservoir should be evaluated to ensure that the treatment system can be used and backflushed while the Guemes Avenue reservoir is empty.

8.2.3 Storage

The existing storage capacity is adequate for the system. There are currently no projects proposed to increase storage volume for the system. Refer to Section 8.2.2 and Section 8.2.5 for projects to increase the efficacy of the existing storage.

8.2.4 Distribution

The following projects address the potential distribution needs.

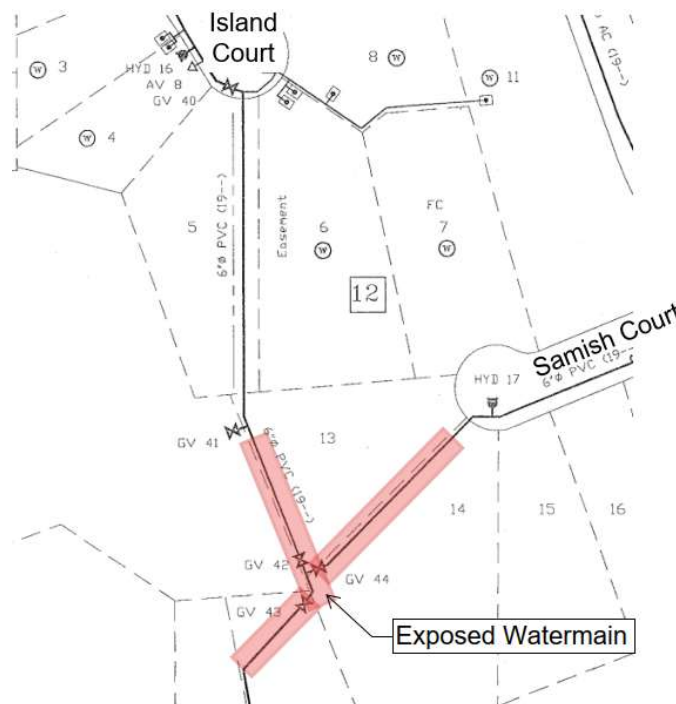
George Drive and Fidalgo Drive Loop

Currently the distribution system is not looping water between George Drive and Fidalgo Drive. Drawing of the water system indicate that there was a connection between these lines previously. Testing of the system serving the sections of Fidalgo Drive and Lopez Drive should be undertaken to determine functionality of the system. In conjunction with the testing potholing of the valve configuration at the Samish Court well field should be conducted to determine the proper configuration of connections that exists on the system. Modifications of the piping and valve configuration should be undertaken to provide service to the Fidalgo Drive loop both from the line from Samish Court and George Drive. As-built drawing should be updated to show the updated configuration.

Exposed 6-Inch Ductile Iron Watermain Replacement – Current Planning Period

Currently there is a 6-inch ductile iron watermain servicing located in an easement west of Samish Court and south of Island Court that are no longer buried a sufficient depth and are exposed in various locations. The general location is identified in Figure 8-1. These exposed pipes present a significant risk form damage from debris, vehicles, and other natural forces. The exposed watermain should be replaced and buried at a minimum depth of 3-feet below the ground surface.

Figure 8-1 Water System Staff Certifications



Periwinkle Road and George Drive Loop – Current Planning Period

Currently Periwinkle Road is serviced by a 2" PVC line that, according to system data, dead ends with a blowout valve on the western side of lot 12 (Parcel S8110-00-13012-0). In the past year

there have been complaints regarding discolored water along the loop from the Periwinkle Road and Mitford Lane. The potential to loop this area could provide additional protection and increased circulation for the system. This connection would connect a pressure zone to the gravity fed line which would likely require an additional pressure reducing vault.

Meter Replacement – Current Planning Period

An evaluation of all meters shall be performed. Any meters that are no longer functioning shall be replaced with a new meter. This work ensures that the system is able to accurately track water usage and charge their customer based on actual water used.

Additional Service to Driftwood Drive – Current Planning Period

Currently the 6" AC gravity main traveling down George Drive is the only point of service for the residences and the community clubhouse located on Driftwood Drive along the shores of Cultus Bay. The existing 6-inch AC mains along George Drive was installed in approximately 1958 and is nearing the end of their useful life. Any break along the 3,750-foot path from Blakely Avenue down to Driftwood Drive will result in a loss of service to all the residences. If this watermain is to be replaced in the future a secondary point of connection will be required. The recommended secondary service would come via a directionally drilled HDPE water main from Hubble Court down the steep slope to the northern end of Driftwood drive. This extension would require the replacement of the 2-inch main down Mitford Lane and Hubble Court with a 4" PVC C-900 pipe and a pressure reducing valve at the end of Hubble Court prior to the transition to an HDPE pipe down to Driftwood Drive. Additionally, the 2" water main from the northern end of Driftwood Drive down to the intersection of Driftwood Drive would need to be replaced with a larger diameter pipe to provide capacity to serve all the residences.

George Drive Water Main Replacement – Current Planning Period/Future Planning Period

The existing 6-inch AC mains along George Drive was installed in approximately 1958 and is nearing the end of their useful life. This water main is a gravity line main that is currently the only point of service for the residences and the community clubhouse located on Driftwood Drive on the shores of Cultus Bay. This water main travels along steep slopes down to Driftwood Drive and a large break in this area could result in significant property damage. The cost estimate provided in Table 3-20 assumes that the replacement would be accomplished with approximately 3,750 linear feet of 6" PVC C-900 pipe or 8" HDPE pipe allowing the existing line to remain in service while a replacement is installed. If an additional source of feeding the parcels on Driftwood Drive is provided alternative forms of trenchless construction should be considered such as pipe bursting or Cured in Place Pipe (CIPP).

Lopez Drive, Orcas Drive, Fidalgo Drive Replacement – Current Planning Period/Future Planning Period

The existing 2-inch and 4-inch mains along Lopez Drive, Orcas Drive, and Fidalgo Drive are insufficient for being able to provide the required fire flow to serve structures in this area. The replaced waterlines should be sized sufficiently at least 6-inches in diameter to provide adequate flow. During the line replacement fire hydrants should be placed in order to provide coverage to all structures in accordance with Island County requirements. The cost estimate provided in Table 3-20 assumes that the replacement would be accomplished with approximately 3,950 linear feet of 6" PVC C-900.

8.2.5 Controls

In 2000 a dedicated fill line with associated controls and electrical components were installed from the well field at Samish Court to the Guemes Avenue reservoir site. Currently the system is controlled via the Guemes Avenue reservoir level with the Maple Point reservoir/standpipe floating on the system. When the Guemes Avenue site is not in service the method to control the system with the level from the Maple Point reservoir/standpipe is complicated and inefficient. The following projects address the potential improvements to the control system:

Maple Point Reservoir Controls – Future Planning Period

The configuration of the piping to the maple point reservoir should be analyzed to determine the most efficient method of using the Maple Point reservoir to control the system. Controls would need to be installed in the Maple Point reservoir and brought up to the Guemes Avenue pumphouse. A top-fill service line should be installed on the Maple Point reservoir to provide additional mixing and turnover.

Upgrading to a SCADA/Control System – Future Planning Period

An analysis should be performed to assess the benefits and cost involved in the installation of a Supervisory Control and Data Acquisition (SCADA) system with associated data logging, reporting, and alarms to monitor the treatment and distribution system. The District should determine with the assistance of the SMA what functionality is desired and beneficial to the long-term management of the system.

8.2.6 Capital Improvements from Previous WSP

These projects identified in the past WSP are shown below:

1. Install a 6-inch C-900 PVC dedicated well supply line to the Guemes Avenue standpipe, complete with direct bury control cables.
2. Construct a booster pump station adjacent to the Guemes Avenue standpipe for the high elevation service area.
3. Install an emergency generator at the booster pump station.
4. Install ozonation and pressure filtration water treatment system to remove iron, manganese and other chemical components that create a chlorine demand. Size the ozone contact tank to provide the primary disinfection. Install a sodium hypochlorinator downstream of filtration as a standby system.
5. Modify the Guemes Avenue standpipe with a separate top entry inlet to provide water circulation and improve treatment system performance.
6. Re-equip Wells 2 and 3 with new pumps to provide adequate pressure to supply the treatment system then discharge into the Guemes Avenue standpipe.
7. Replace the pitless adapter on the new well (Well No. 3) with an extended well casing, a conventional well seal, discharge manifold, probe pipe, well enclosure, etc.
8. Abandon the twin steel tanks at the well site, and associated piping and structures.
9. Install two new pressure reducing valve stations to allow the high elevation service area to supply the Driftwood Drive low elevation service area for domestic and fire flow.
10. Replace the two old pressure reducing valve stations supplying isolated low elevation service areas.
11. Install control monitor at the well site. The controls will monitor water levels in the standpipes (high level alarm, low level alarm, etc.), pressure in the distribution system, etc.

The majority of these items were fully or partially completed, except for the following items:

1. The ozonation treatment system pilot system was removed and ultimately wasn't fully installed after the downstream sodium hypochlorinator was installed.
2. Only one of two pressure reducing valves were installed to supply Driftwood Drive.

Item 2 is listed as an item to be carried as part of this Water System Plan. Item two has been identified as an unnecessary improvement. Further evaluation of the treatment system and process is recommended in this WSP.

8.2.7 Developer Extensions

Developer extensions are listed in the CIP to identify major water main improvements above and beyond normal looped water main improvements that land developments typically construct for the direct benefit of their project. These specific improvements should be incorporated into future land development activities along property frontage or within land development itself. While the proposed Water System Plan shows a straight-line alignment for these improvements, actual alignments may be adjusted to local topography and land use.

These projects are not anticipated to be funded by the District and are not incorporated in the long-term funding and water rate analysis. It is anticipated that these improvements will be incrementally constructed as land use development the following project has been identified as Developer Projects form the WSP:

Headlands Way Western Expansion – Current Planning Period

Over the past couple years there have been inquiries regarding service from the Scatchet Head Water District from residences located off of Headlands Way. Headlands Way is located off of Mortland Drive approximately 350 feet south of the intersection of Orange Street. Headlands Way starts in the located noted at an elevation of 350 and travels southwest for approximately 4,000 feet down to an elevation of 275. With the expanded capacity outlined by this WSP the District has the capacity and water rights to meet the demand from additional customers.

8.2.8 Non-Facilities

Potential non-facility improvements include continued promotion of conservation policies, clarification of the systems Water Rights and updates of the Water System's procedures and policy to ensure that the integrity of the water distribution system is maintained. The following items have been identified for the WSP planning periods:

Water Rights Clarification – Current Planning Period

The District is no longer using Well 1 as a source of water for the system. The existing water rights should be reviewed with an attorney and the DOE to verify that the District has adequate perfected and permitted water rights to meet the future systems anticipated needs and is making satisfactory progress on perfecting the permitted water rights. Adequate water rights are essential to ensuring the long-term viability of the system.

8.3 Selection of Alternatives

The discussions of projects for supply, storage and distribution are contained within Chapter 3 and summarized in Section 8.2 above. The sequence and scheduling of projects was developed by following a general priority outline balanced with the review of the current and projected financial resources of

the District. These financial resources are further detailed in Chapter 9. The considerations in selecting projects included:

- Health Standards
- Land Use
- Quantity
- Reliability
- Costs
- Regional Benefit
- Environmental Effects
- Flexibility
- Implementation
- Life Expectancy
- Risk

8.4 Improvement Schedule

WAC 246-290-100 specifies that the WSP shall plan improvements for at least 20 years into the future with an annual schedule of improvements at least 6 years into the future. The WSDOH Planning Handbook states that the improvement schedule should be based on one or more of the following schedule considerations:

- Identified Deficiencies
- Growth
- Fixed Dates Financial Priority
- Milestones
- Ongoing Programs
- Availability of Outside Funding
- Major Facilities
- Critical Facilities
- Distribution Facilities
- Non-Facilities
- Timing of Improvements
- Location of Improvements

The improvement projects shown in Table 3-20 was developed based on the above factors and the prioritization system presented in Section 3.5.

8.5 Improvement Project Funding

As further detailed in Chapter 9, it is projected that all planned capital improvement projects scheduled for the next 20 years may be funded by projected cash reserves. A table is provided in APPENDIX O which outlines how the funding is separated in the next 20-years. Due to immediate needs that may arise due to failing infrastructure other methods of funding immediate needs may need to be evaluated. Section 9.3 discusses various options for funding improvement projects.

9 FINANCIAL PROGRAM

This Chapter summarizes the Water District’s financial program. The Scatchet Head Water District is an approved water district in the State of Washington. The Water District’s revenue is derived from quarterly service charges, new customer connection charges, miscellaneous fees and charges relating to new connections.

9.1 Past Financial Status

The Water District has seen its yearly net income drop over the past three years from approximately \$7,000 in 2016 to a deficit of approximately \$13,000 in 2018. Total income over this period stayed relatively constant at around \$138,000 while the Water District’s expenses rose from approximately \$128,000 in 2016 to approximately \$150,000 in 2018. The rise in yearly expenses is in large part due to increased costs for water maintenance and repair in 2018 and the cost of hiring professional engineering services in 2017 and 2018. The 2015 operating budget was not included in these numbers because according to the District’s Four-Year Operating Budget shown in Table 9-1, the District did not pay any taxes that year. Therefore, the total expenses for 2015 are considered an anomaly. A copy of the District’s financial information is included in APPENDIX P.

The operations, maintenance, and billing are currently managed by King Water Company. This arrangement provides the system with dedicated staff with specific expertise in water system operations and the billing and accounting functions needed to provide the efficient operation of the system.

Table 9-1 Four Year Operating Budget

	2015	2016	2017	2018
REVENUES				
Water Fees	134,396.46	132,192.15	137,928.41	134,670.49
Late Fees	773.47	420.63	785.14	402.09
Reimbursed Expenses	3,382.00	2,297.35	2,728.00	2,261.00
Total Income	138,551.93	134,910.13	141,441.55	137,333.58
EXPENSES				
Bond				
Transfer to Bond Fund	45,000.00	45,000.00	45,000.00	45,000.00
Direct Salaries and Wages				
Manager Salary	7,200.00	7,200.00	7,200.00	7,200.00
Commissioners Pay	3,648.00	3,762.00	3,534.00	4,186.00
Meter Reading	600.00	600.00	600.00	700.00
Payroll Expenses	1,140.56	1,147.80	1,156.44	1,136.09
Total Direct Salaries and Wages	12,588.56	12,709.80	12,490.44	13,222.09
Water Maintenance				
Water Management	12,348.00	12,348.00	12,348.00	13,058.00
Water Repairs and Maintenance	7,385.06	9,402.05	7,356.54	17,512.05
Water Testing	1,455.50	1,548.00	1,523.00	3,071.00
Chlorine and Chemicals	2,518.53	2,325.60	2,706.46	2,923.83
Reservoir Cleaning	0.00	3,206.65	0.00	0.00

Sanitary Survey	1,142.92	0.00	0.00	0.00
Capital Improvement	2,450.10	0.00	0.00	0.00
Supplies/Parts	0.00	0.00	59.17	262.51
Flushing	0.00	0.00	0.00	1,747.90
Water System Site Maintenance	0.00	0.00	0.00	19.90
Total Water Maintenance	27,300.11	28,830.30	23,993.17	38,595.19
Utilities				
Telephone	214.44	214.44	214.44	214.44
Propane	441.79	189.59	92.40	92.51
Electric	8,886.43	11,319.06	11,145.02	13,566.50
Total Utilities	9,542.66	11,723.09	11,451.86	13,873.45
General and Administrative				
Liability Insurance	4,397.00	4,503.00	4,657.00	5,017.00
Dues and Subscriptions	637.23	651.99	422.70	629.05
Island County NSF Fee	40.00	80.00	240.00	160.00
Licenses and Permits	724.00	724.00	724.00	1,202.76
Office Supplies	248.64	153.30	294.66	85.76
Billing Cards and Stamps	1,329.68	1,083.30	1,451.09	1,545.26
Certified Letter Fees	2,241.59	2,233.79	2,299.03	1,630.50
Mailings	0.00	0.00	0.00	1,946.05
Lien Filing Fees	507.00	154.44	155.44	190.23
Printing and Reproduction	44.46	75.60	234.55	70.51
Professional Development	0.00	152.89	270.40	0.00
Freedom of Information Response	0.00	0.00	0.00	1,395.71
Total General and Administrative	10,169.60	9,812.31	10,748.87	12,477.12
Professional Services				
Engineering	0.00	600.00	13,780.49	6,345.49
Accounting	9,600.00	9,600.00	9,600.00	10,080.00
Audit	0.00	1,391.12	205.44	145.66
Legal Fees	0.00	0.00	0.00	1,890.50
Subcontractor/Maintenance	0.00	0.00	2,282.70	0.00
Total Professional Services	9,600.00	11,591.12	25,868.63	18,461.65
Taxes				
State Utility Tax	-150.55	8,136.59	6,943.22	7,240.78
Property	78.26	78.26	78.26	78.26
Total Taxes	-72.29	8,214.85	7,021.48	7,319.04
Total Expenses	114,128.64	127,881.47	136,574.45	150,344.25
NET				
Total Income	138,551.93	134,910.13	141,441.55	137,333.58
Total Expenses	114,128.64	127,881.47	136,574.45	150,344.25
Net Income	24,423.29	7,028.66	4,867.10	-13,010.67

9.2 Future Budgeting

There is concern about the long-term financial viability of the Water District and its ability raise the funds needed to implement the capital improvements identified in this plan. Due to an increase in expenses, the Water District has seen its net income decline in recent years, to the point of operating with a deficit in 2018. It is suggested that the District implement a new increasing block rate structure and raise its water rates in order to increase its income and ensure these concerns are addressed. As of August 2019, the SHWD Board of Commissioners has adopted a revised rate structure for the system which is reflected in Section 9.5.5.

The new block rate structure includes the following elements:

- Base Rate – A base rate that is which will gradually increase over the next five years.
- Consumption Rate – The District is also increasing the cost associated with increased consumption for usage over 2,000 cubic feet and an additional charge for water in excess of the 3,000 cubic feet metered to a customer. Such a rate structure should encourage water conservation by customers and increases income for the District.

It is suggested that the Water District have a rate study performed to determine a rate and fee structure that will insure the long-term financial viability of the District.

9.3 Potential Methods of Improvement Financing

Most of the SHWD capital improvements projects are to be initiated and paid for by the Water District's water connections fees and reserves currently on hand. The major project initiated by the Water District for this planning term will primarily consist of replacement of aging water mains, main looping and work associated with source water supply improvements. SHWD has aging existing mains so there are plans for main replacement in the current and future planning cycles. Additional system reserves should start to be established now for these future expenses.

Municipal water projects can be financed through one of several methods or quite often through a combination of these methods. The potential methods of funding municipal water projects are discussed in the following sections.

9.3.1 Cash Financing

This method involves setting aside a certain amount of the net income each year to finance improvements. This method of financing is sometimes used for well-developed systems where large capital improvements, new storage facilities or transmission mains are not necessary or have been funded by other means. This system is proactively setting aside monies to be able to self-fund future water system improvements including treatment and main replacement projects.

The 6-Year Capital Improvements Plans (CIP) was developed based upon the District's predicted cash flow and construction cost estimates. The sequencing is based upon the current revenue stream from the sale of additional water connections. Variations in the number of connections sold will influence the District's ability to fund these projects. Higher growth rates will allow an acceleration of the capital improvement plan. Slower growth will slow the implementation of the improvement programs or require a raise in the water rates to provide additional capacity to fund critical projects. In addition, this assessment assumes that the District will raise the water rates to sustain operating expenses.

9.3.2 *Special Assessments*

Special assessments are primarily used for localized improvement projects where the property within the specified area is assessed in accordance with the benefits received. Special assessments are not deductible from an individual's income tax. The ability of the SHWD to use Special Assessments would need to be thoroughly investigated as water and sewer districts are not authorized to levy special assessments in various circumstances, such as on state or federally owned lands.

9.3.3 *State and Federal Loans and Grants*

CIPs such as wells, storage facilities and transmissions mains are sometimes eligible for state or federal matching money when those funds are available. Governmental funds for both loans and grants are diminishing and have become very competitive among public entities. The types and availability of funds vary from month to month. Depending on project and loan/grant program specifics, the State and Federal loans and/or grants will be explored during the pre-design phase capital improvements.

The Water District will continue to make application to all funding sources when available. The Water District sets aside funds to pay the District's share of future capital improvement projects so that if and when grant or loan money becomes available, the Water District will be in the position to proceed immediately with the project; improving the chances of obtaining the grant or loan money. The source of the funds for capital improvements could come from higher water rates, a higher connection charge or a special charge for capital improvements for each new connection, or a combination of the above.

9.4 **Financial Viability Test**

The Department of Health has developed four tests to determine the water system's financial health. Based on the Water District's six-year operating budget the water system passes each of these tests. The financial viability tests are summarized below:

Test 1 – Develop an Operating Budget

The first test requires the utility to develop an operating budget that demonstrates sufficient revenue to meet all of its incurred expenses. The initial operating budget is for a six-year period and the developed budget can be found in Table 9-4. Updates to the budget should be completed at least every three months, including impacts from projects and activities identified in the utility's WSP.

Test 2 – Create and Fund an Operating Cash Reserve

The second test requires the utility to develop and fund an Operating Cash Reserve. The Operating Cash Reserve is essentially the "check-book balance" a utility must maintain to meet its cash flow needs and provide contingency funds for unforeseen operating emergencies. It is recommended that utilities attempt to keep at least 1/8 of their annual operating and maintenance (O&M) and general and administrative (G&A) expenses in an Operating Cash Reserve to prevent potential cash flow problems. This 1/8 annual operating budget figure is established by DOH as Test No. 2.

The District has established a target minimum of \$20,000 which surpasses the recommended 1/8 of the operating budget from the last five years. SHWD will pay off their bond this year which will provide an additional \$45,000 of revenue which will allow the District to pass this test.

Test 3 – Create and Fund and Emergency Reserve

The third test requires the utility to demonstrate its ability to cover the costs of an emergency or the failure of its most vulnerable system component. This can be accomplished by either 1) developing and funding an Emergency Reserve, or 2) obtaining an alternative financing arrangement. Generally, replacement of a production well, the largest pumping equipment, or key transmission lines represent the most expensive and difficult facilities to replace. The replacement costs of these facilities are generally used to estimate the minimum Emergency Reserve amount.

The SHWD has a goal of maintaining a \$100,000 minimum balance in the Reserve Fund, which will cover most repairs or provide the financial flexibility to pursue the necessary funding to address significant

repairs. The District has recently had a Reserve Fund that surpassed this minimum balance which was used to repair the 300,000-gallon reservoir. The additional funds available from the paid bond will allow the District to replace the funds previously used. The District passes Test No. 3 because it has maintained the necessary Reserve Fund and has a financial plan to replace previously used funds.

Test 4 – Conduct Median Household Income Index Analysis

The fourth and final test requires the utility to measure the customer impacts due to increasing water rates required to fund operating and facility expenses. To complete this test, the utility must:

1. Compute 1½ percent of the respective County’s average annual median household income (MHHI). The MHHI is a value computed by the U.S. Census Bureau. The US Census estimated the median annual income for Island County to be \$61,516 (in 2017dollars). 1½ percent of the MHHI would be \$923.
2. Determine the current and projected average annual residential water bill for all six years.
3. Compare the existing and projected average annual residential bill to 1½ percent annual MHHI for all six years.

This analysis provides an indication of a residential customer’s ability to pay the existing and projected water rates. When rates exceed 1½ percent of the MHHI in any year of the budget, it suggests the utility’s rates may not be affordable.

As outlined in Section 9.5.1 currently the average annual charges for water is \$294.08 for approximately 5,000 gallons per month. The District easily passes Test 4.

With the fees far below the 1½ percent threshold it is recommended that the District undertake an in-depth rate analysis to more accurately assess the proper billing approach to more thoroughly fund the District in future phases of the capital improvements program.

9.5 Rates and Charges Structure Analysis

The Water District’s current rate/fee system is summarized in the following sections.

9.5.1 Water Rates Prior to August 2019

Meters are read and billed on a quarterly basis. The base rate prior to this report was \$73.52 for up to 2,000 cubic feet (14,960 gallons) and had a tiered block charge structure to encourage conservation. The block charges were:

- \$0.0511/cubic foot or portion thereof to 3,000 cubic feet (22,441 gallons)
- \$0.0638/cubic foot or portion thereof after 3,000 cubic feet (22,441 gallons)

9.5.2 Main Extensions and Connection Charges

The cost and construction of main extensions are typically the responsibility of the developer. The District would complete recovery contracts for most main extensions fronting properties that are not connecting to the extended main. When the property applies for service, a recovery fee may be collected by the Water District for the benefit of the Water System and/or the private party who paid for the main extension.

9.5.3 Service Installation Fees

New water customers of Scatchet Head Water District must purchase a water share from Water District. The purchase price per share is, as of April 2019, \$5,000. The purchase price for a water share is allocated for capital improvements and is maintained in the District’s banking account. Once the share is sold the base connection charge indicated above, currently \$73.52 quarterly is charged. The Water District should continue to monitor the system capital needs, revenue and facility requirements on an annual basis to help determine if the Share price should be modified. Over the past three years the total

revenue from new installation fees has been \$20,000 with three of the 4 service connections being installed in 2019. Over the next 10-year the District plans on having an additional 20 connections which will bring in an additional \$100,000 in revenue. The rate of expansion in the District is partially dependent on both the number of lots in the service area and the ability for those lots to provide adequate septic systems for single-family residences.

The applicant is responsible for connecting to the downstream side of the meter setter and all service lines and appurtenances located on their private property. The water line installation should be performed by a licensed contractor and all such work should be performed under the inspection and supervision of the Water District or a specified representative.

9.5.4 Other Water Fees

The Water District has set fees for other charges relating to special action or billing problems. The current rates, as of 2019, are shown below:

Table 9-2 Current System Fees

Description	Fee
Late Payment Fee	10% at 60 day 10% at 90 days
Shut-off Fee:	\$50
Reconnection Fee:	\$50
Certified Letter Fee:	\$15

9.5.5 Adopted Water Rate Structure

As discussed in Section 9.2 the Water District Board of Commissioners has implement an new, increased block rate structure until a study can be performed to determine a rate structure that will insure the long term financial viability of the District. The new rate structure adopted at their August 2019 meeting is outlined in Table 9-3 below:

Table 9-3 Interim Increasing Block Rate Structure

	2019	2020 *	2021	2022
Metered Connection**	\$94.52	\$116.58	\$142.31	\$154.39
2,0000 -3,000 CF***	\$0.070	\$0.070	\$0.070	\$0.070
Over 3,000 CF***	\$0.090	\$0.090	\$0.090	\$0.090

* Effective rate as of November 2020.

** Meter connection includes the cost for the first 2,000 cubic feet of water.

*** The cost shown is the cost of water per cubic foot of usage.

As outlined in Section 9.5.1 the metered connection fee would include up to 2,000 cubic feet (14,960 gallons) each quarter. The tiered block charge structure to encourage conservation would still exist for usage up to 3,000 cubic feet (22,441 gallons) and an additional increase in rate for every cubic foot in excess of 3,000 cubic feet. These increases are all outlined in Table 9-3. The projected future rates in 2023 at approximately \$454.08 per year will still remain under the 1½ percent of the current MHHI as directed by Test 4 of the financial viability test.

9.5.6 Capital Improvement Project Budget and Funding

A preliminary budget for the District is provided in Table 9.4. The proposed budget developed by the District shows an increasing profit for the next few years that will stabilize at approximately \$115,000 per year. The Capital Improvement Projects will need to be funded through the District's net profit as those expenditures aren't included in the table below. A preliminary budget for the Capital Improvement Projects over the 20-year planning period which outlines the division of profits to meet the desired Capital Improvement Projects is provided in APPENDIX O. The District may desire, or failing infrastructure may require the use of alternative means to finance the capital improvement projects. Sections 9.3 of this plan outlines various funding alternatives that should be considered by the District as they assess their short-term and near-term goals. The District should continually assess their budget and financial schedule to ensure they are properly managing the short-term and long-term goals for the system.

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Table 9-4 Future Six-Year Operating Budget

	Year 1 2020	Year 2 2021	Year 3 2022	Year 4 2023	Year 5 2024	Year 6 2025
REVENUES						
Water Fees	\$168,000.00	\$201,600.00	\$236,300.00	\$254,100.00	\$254,100.00	\$254,100.00
Late Fees	\$400.00	\$400.00	\$400.00	\$400.00	\$400.00	\$400.00
Reimbursed Expenses	\$2,500.00	\$2,500.00	\$2,500.00	\$2,500.00	\$2,500.00	\$2,500.00
Total Income	\$170,900.00	\$204,500.00	\$239,200.00	\$257,000.00	\$257,000.00	\$257,000.00
EXPENSES						
Direct Salaries and Wages						
Manager Salary	\$7,200.00	\$7,200.00	\$7,700.00	\$7,700.00	\$8,200.00	\$8,200.00
Commissioners Pay	\$4,000.00	\$4,400.00	\$4,600.00	\$4,600.00	\$4,600.00	\$4,800.00
Meter Reading	\$700.00	\$900.00	\$900.00	\$900.00	\$900.00	\$900.00
Payroll Expenses	\$1,150.00	\$1,350.00	\$1,350.00	\$1,550.00	\$1,550.00	\$1,550.00
Total Direct Salaries and Wages	\$13,050.00	\$13,850.00	\$14,550.00	\$14,750.00	\$15,250.00	\$15,450.00
Water Maintenance						
Water Management	\$13,100.00	\$14,000.00	\$14,000.00	\$15,000.00	\$15,000.00	\$15,000.00
Water Repairs and Maintenance	\$10,500.00	\$10,500.00	\$10,500.00	\$10,500.00	\$10,500.00	\$10,500.00
Water Testing	\$2,750.00	\$2,750.00	\$2,750.00	\$3,000.00	\$3,000.00	\$3,250.00
Chlorine and Chemicals	\$3,600.00	\$3,600.00	\$3,600.00	\$3,800.00	\$3,800.00	\$3,800.00
Reservoir Cleaning	\$0.00	\$0.00	\$4,500.00	\$0.00	\$0.00	\$0.00
Sanitary Survey	\$2,000.00	\$0.00	\$0.00	\$3,000.00	\$0.00	\$0.00
Capital Improvement	See Capital Improvements Budget in Appendix O					
Supplies/Parts	\$300.00	\$300.00	\$400.00	\$400.00	\$500.00	\$500.00
Flushing	\$2,000.00	\$2,000.00	\$2,000.00	\$3,000.00	\$3,000.00	\$3,000.00
Total Water Maintenance	\$34,250.00	\$33,150.00	\$37,750.00	\$38,700.00	\$35,800.00	\$36,050.00

Utilities						
Telephone	\$250.00	\$250.00	\$250.00	\$250.00	\$300.00	\$300.00
Propane	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00
Electric	\$14,000.00	\$14,150.00	\$14,600.00	\$14,600.00	\$14,600.00	\$14,900.00
Total Utilities	\$14,400.00	\$14,550.00	\$15,000.00	\$15,000.00	\$15,050.00	\$15,350.00
General and Administrative						
Liability Insurance	\$5,100.00	\$5,100.00	\$5,500.00	\$5,500.00	\$6,000.00	\$6,000.00
Dues and Subscriptions	\$650.00	\$650.00	\$650.00	\$700.00	\$700.00	\$800.00
Island County NSF Fee	\$200.00	\$200.00	\$200.00	\$250.00	\$250.00	\$250.00
Licenses and Permits	\$1,250.00	\$1,250.00	\$1,250.00	\$1,250.00	\$1,250.00	\$1,250.00
Office Supplies	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00
Billing Cards and Stamps	\$1,600.00	\$1,600.00	\$1,600.00	\$1,600.00	\$1,600.00	\$1,600.00
Certified Letter Fees	\$3,000.00	\$3,000.00	\$3,500.00	\$3,500.00	\$3,500.00	\$4,000.00
Mailings	\$1,500.00	\$1,500.00	\$1,500.00	\$2,000.00	\$2,000.00	\$2,000.00
Lien Filing Fees	\$200.00	\$200.00	\$200.00	\$200.00	\$200.00	\$200.00
Printing and Reproduction	\$100.00	\$100.00	\$100.00	\$100.00	\$100.00	\$100.00
Professional Development	\$500.00	\$500.00	\$500.00	\$500.00	\$500.00	\$500.00
Freedom of Information Response	\$1,500.00	\$1,500.00	\$1,500.00	\$1,500.00	\$1,500.00	\$1,500.00
Total General and Administrative	\$15,850.00	\$15,850.00	\$16,750.00	\$17,350.00	\$17,850.00	\$18,450.00
Professional Services						
Engineering	\$15,000.00	\$15,000.00	\$18,000.00	\$18,000.00	\$20,000.00	\$20,000.00
Accounting	\$11,000.00	\$12,000.00	\$12,000.00	\$13,000.00	\$14,000.00	\$14,000.00
Audit	\$1,000.00	\$1,000.00	\$2,000.00	\$2,000.00	\$2,500.00	\$2,500.00
Legal Fees	\$2,000.00	\$2,000.00	\$2,000.00	\$3,000.00	\$3,000.00	\$3,000.00
Subcontractor/Maintenance	\$2,500.00	\$2,500.00	\$2,500.00	\$3,000.00	\$3,000.00	\$3,000.00
Total Professional Services	\$31,500.00	\$32,500.00	\$36,500.00	\$39,000.00	\$42,500.00	\$42,500.00

Taxes						
State Utility Tax	\$8,000.00	\$9,600.00	\$11,300.00	\$12,100.00	\$12,100.00	\$12,100.00
Property	\$100.00	\$100.00	\$100.00	\$100.00	\$100.00	\$100.00
Total Taxes	\$8,100.00	\$9,700.00	\$11,400.00	\$12,200.00	\$12,200.00	\$12,200.00
Total Expenses						
	\$117,150.00	\$119,600.00	\$131,950.00	\$137,000.00	\$138,650.00	\$140,000.00
NET						
Total Income	\$170,900.00	\$204,500.00	\$239,200.00	\$257,000.00	\$257,000.00	\$257,000.00
Total Expenses	\$117,150.00	\$119,600.00	\$131,950.00	\$137,000.00	\$138,650.00	\$140,000.00
Net Income	\$53,750.00	\$84,900.00	\$107,250.00	\$120,000.00	\$118,350.00	\$117,000.00

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10 MISCELLANEOUS DOCUMENTS

This Chapter summarizes supportive documents and agreements that are not otherwise discussed in other sections of the Water System Plan.

10.1 Meeting of the Consumers

This Water System Plan was passed by resolution by the SWHD Board of Commissioners during their monthly meeting on August 8, 2019. This Water System plan was presented to consumers for the SHWD during their public meeting held on Thursday September 5, 2019. Minutes for the SHWD meeting whereupon the Water System plan was presented to the public for comment are included in APPENDIX T.

10.2 County/Adjacent Utility Correspondence

Island County was notified of the updated Water System Plan for the SHWD. In addition to Island County, adjacent Utilities will also be notified as required by the state.

Correspondence that supports the updating of the Plan is provided in APPENDIX U.

10.3 State Environmental Policy Act (SEPA) Determination

A State Environmental Policy Act (SEPA) checklist is not required as the Water District serves less than 1,000 connections. Therefore, the documentation has not been included with the Plan.

10.4 Agreements

The Water District's Service Area Agreement is attached in APPENDIX A.

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APPENDIX A District Documents

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SMA - KING WATER, Co. CONTRACT

King Water Company

Water System Management and Services Agreement

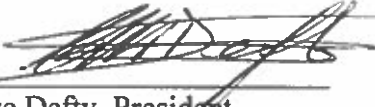
This Agreement is made and entered into as of March 1, 2011, by and between King Water Company (King), a Washington company and Scatchet Head Water District, hereinafter referred to as the "Customer". In consideration of the mutual covenants and representations contained in this Agreement, the parties hereby agree as follows:

- I. Purpose. The purpose of this Agreement is to set out the intent of King and Customer to enter into a relationship whereby King provides water system management, or other services, to Customer. A description of the Customer's water system is set out in Exhibit A.
- II. Scope of Work. The work to be performed by King Water Company under this Agreement is described in Exhibit B. Work on a residential service connection beyond the water meter is not covered by this contract.
- III. Changes/Modifications to Agreement. King shall make a good faith effort to implement any changes or modifications to this Agreement that may be requested by Customer. Customer recognizes, however, that any changes or modifications to the Agreement may cause King difficulties and delays in the fulfillment of its obligations pursuant to this Agreement. King reserves the right, therefore, in its sole discretion, to refuse to incorporate such changes and modifications, or to charge Customer at the current hourly rate published for such services.
- IV. Acceptance of Work. King shall deliver certain portions of the work in accordance with the schedules attached as Exhibits, and hereby incorporated into this Agreement, or as required by Washington State Department of Health regulations.
- V. Payment. In consideration for the services and work described above Customer shall pay to King Water Company an amount in U.S. funds as set out in Exhibit C.
- VI. Termination. Effective each anniversary date, upon thirty (30) days prior written notice, either party may terminate this Agreement for any reason in its sole discretion. Upon termination, each party shall be fully and forever released and discharged from any and all obligations, covenants or liabilities of whatsoever kind or nature in law, or equity, or otherwise, arising out of, or in connection with, the Agreement, or any other agreements by and between King Water Company and Customer, except for any obligation or liability accrued before the date of termination.
- VII. Agreement Period. The term of this Agreement is for a minimum period of one (1) year, which will automatically be renewed unless terminated by either party as set out in paragraph VI above.
- VIII. Warranties and Representations. Each party hereby represents and warrants as follows:
 - Corporate Power. Each party is duly organized and validly existing under the laws of the state of its incorporation and has full corporate power and authority to enter into this Agreement and to carry out the provisions hereof.
 - Due Authorization. Such party is duly authorized to execute and deliver this Agreement and to perform its obligations hereunder.

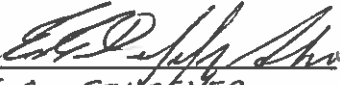
The representations and warranties and covenants in this Section are continuous in nature and shall be deemed to have been given by each party at execution of this Agreement and at each stage of performance hereunder.

- IX. Binding Agreement. This Agreement is a legal and valid obligation binding upon it and enforceable with its terms. The execution, delivery and performance of this Agreement by such party does not conflict with any agreement, instrument or understanding, oral or written, to which it is a party or by which it may be bound, nor violate any law or regulation of any court, governmental body or administrative or other agency having jurisdiction over it.
- X. Compliance With Law. Each party's operations will be conducted in compliance with all applicable laws and regulations of the State of Washington.
- XI. Indemnification and Limitation of Liability.
- **Indemnification by King Water Company.** King shall, at its expense and at Customer's request, defend any third-party claim or action brought against Customer, and Customer's officers (i) relating to the work performed by King pursuant to this Agreement, and (ii) to the extent it is based upon a claim that, if true, would constitute a breach of a King warranty, representation or covenant set forth in this Agreement. King shall indemnify and hold Customer harmless from any costs, damages and fees reasonably incurred by Customer, including but not limited to attorney and other professional fees, that are attributable to such claims. Customer shall provide King prompt notice in writing of any such claim and provide King with reasonable information and assistance, at King's expense, to help in King's defense.
 - **Indemnification by Customer.** Customer shall, at its expense and at King's request, defend any third-party claim or action brought against King, and its officers, employees, licensees, and independent contractors, (i) relating to Customer's negligent or intentional misconduct, and (ii) to the extent it is based upon a claim that, if true, would constitute a breach of a Customer warranty, representation or covenant set forth in this Agreement. Customer shall indemnify and hold King harmless from and against any costs, damages and fees reasonably incurred by King, including but not limited to attorney and other professional fees that are attributable to such Customer claims. King shall provide Customer reasonably prompt notice in writing of any such claims and provide Customer with reasonable information and assistance, at Customer's expense, to help Customer defend such claims.
- XII. Applicable Law: Jurisdiction: Venue. The Agreement shall be governed and construed in accordance with the laws of the State of Washington. The parties agree that Island County in the State of Washington shall be the proper venue for any action brought under the Agreement.
- XIII. Modifications, Amendments or Waivers. No modifications or amendments to the Agreement, and no waiver of any provisions hereof shall be valid unless in writing signed by duly authorized representatives of the parties.
- XIV. Force Majeure. King shall not be responsible for any failure to perform due to unforeseen circumstances or due to a cause beyond King's control, including but not limited to acts of God, war, riot, embargoes, acts of civil or military authorities, fire, floods, accidents, strikes, or shortages of transportation facilities, fuel, energy, labor or materials.

- XV. Independent Contractor Relationship. Nothing contained herein shall be construed to imply a joint venture, partnership, or employer and employee relationship between the parties. Neither party shall have any right, power or authority to create any obligation, express or implied, on behalf of the other except as defined in the Agreement or as mutually agreed to under the terms of the Agreement. The employees or agents of one party shall not be deemed or construed to be the employees or agents of the other party for any purpose whatsoever.
- XVI. Binding Effect. Subject to the limitations herein before expressed, this Agreement will inure to the benefit of, and be binding on, the parties, their successors, administrators, heirs, and permitted assigns.
- XVII. Compliance/Government Approvals. King and Customer will, at its own expense, obtain and arrange for the maintenance in full force and effect of all government approvals, consents, licenses, authorizations, declarations, filings and registrations as may be necessary or advisable for the performance by such party of all of the terms and conditions of the Agreement.
- XVIII. Entire Agreement; Modification; No Offer. The parties hereto agree that this Agreement constitutes the entire agreement between the parties with respect to the subject matter hereof. It shall not be modified except by a written agreement dated subsequent hereto signed on behalf of King and Customer by their duly authorized representatives. Neither this Agreement nor any written or oral statements related hereto constitute an offer, and this Agreement shall not be legally binding until executed by both parties hereto.

By: 
Clive Defty, President
King Water Company
P.O. Box 2243
Oak Harbor, WA 98277
1-360-678-5336

February 10, 2011.
Date

By: 
F.C. SCHAEFER
Scatchet Head Water District
7906 Guemes Avenue
Clinton, WA 98236

2/10/11
Date

King Water Company

Water System Management and Services Agreement

Description of System

General

- | | |
|---|-----------------------------------|
| a) Group | A. |
| b) No. of wells | Two |
| c) Well pump information | Already provided |
| d) Reservoir size | Two – 300,000 and 120,000 gallons |
| e) Pressure tank(s). | 1,000 gallon hydro-pneumatic tank |
| f) Booster pump(s). | Four – 7.5 hp |
| g) Main & distribution lines | See as-built drawings |
| h) Valves and other appurtenances necessary for the operation of the water distribution system. | See as-built drawings |
| i) # of service connections | 412 |
| j) Other information | _____ |

Chlorination System

Yes

Filtration System

Yes – air induction and BIRM filters.

King Water Company

Water System Management and Services Agreement

Description of Services Provided

Operations

Oversight by Certified Water Manager who will ensure that all of the system's daily operational and maintenance activities are completed according to acceptable public health practices and water industry standards. Specific activities include:

- Frequency of routine service calls – 3 times a week, more often if necessary.
- Maintain pump house log documentation for all activities.
- Regular inspection of distribution system for leaks.
- Water usage monitoring during each visit – plus monthly reports.
- Implement preventative maintenance programs.
- Perform water quality monitoring.
- Emergency call out – available 24/7 via answering service.
- Regularly monitoring of pumping rates and system pressures.
- Maintain system documentation, testing results, and compliance with appropriate regulations.
- Communications with State and/or County Health Departments, as necessary.
- Response to, and handling of, customer complaints.
- Coordination of any specialized needs of the system, as approved by Customer, and arrangements with other independent contractors.

Treatment System Maintenance (to be added, where appropriate).

Monitor proper operation of chlorination system. Take high and low chlorine readings during each visit. Ensure that chlorine vat has adequate levels of sodium hypochlorite at all times, reorder and deliver, as necessary (see charges at Exhibit C). Perform regular preventative maintenance, such as regularly cleaning of the chlorine vat, and inspection of chlorine pumps and injectors. Regularly adjust chlorination rates to maintain an approximate 0.2 ppm residual level of chlorine in the system. Daily monitoring of the chlorine levels to be continued by designated resident on the days we do not visit.

Monitor proper component operation of filtration system. Take weekly manganese samples and monitor performance of the filters. Performance of regular preventative maintenance, such as air scrubbing and overnight soaking of the filters with potassium permanganate, when required, and equipment repairs will be subject to time and material charges.

Documentation and Reports

Prepare annual Consumer Confidence Report.
Prepare and submit necessary reports to State and County Departments of Health.
Submit monthly chlorination report to State.
Maintain records of operating logs and other documentation, as required.
Provide operating reports to Customer, as requested.
Provide and monitor “unaccounted for water” at each billing cycle.

Water billing and administrative services:

The following services will be provided each month:

1. Prepare vouchers for the Commissioners and, when approved, submission to the County's Auditors, based on invoices provided in a timely manner;
2. Pick up completed warrants from the County and mail them to the respective vendors;
3. Prepare quarterly payroll and excise tax returns;
4. Prepare annual W 2, 1099 or other tax returns;
5. Prepare a quarterly billing to water users, based on meter readings.
6. Prepare and send out billings with return envelope, collect funds and deposit all monies received into Customer's bank account;
7. Provide a quarterly report on water used by customer and for the district as a whole;
8. Provide quarterly reports on water billings and a monthly report on balances due;
9. Reconcile funds received and disbursed with the County reports; and
10. Provide monthly statements of activities in the operating & maintenance, bond and construction and emergency accounts;
11. Answer customer billing questions, fill out paperwork for title companies on the sale of homes, work with the Commissioners on overdue debt collection and provide such other information as may be requested.
12. Water bill collection services – a fee is charged for sending out each certified letter. Excessive time spent in account analysis and other activities associated with collection of balances due will be billed based on actual time expended.

Financial and Administrative Services (may be subject to additional charges, see Exhibit C for current labor costs):

- Assist in the development of annual budget.
- Assist in repair and maintenance planning
- Assist in capital project planning.

Additional Services (may be subject to additional charges, see Exhibit C for current labor costs):

System repair and maintenance

Well deeping, if requested and feasible. If no well deeping tube and damage to King Water equipment occurs as a result, customer is liable to reimburse King for repair to equipment.

Implementation of system-wide flushing program, if necessary.

Installation and replacement of meters, as required.

Meter reading, as required.

Reservoir cleaning.

Oversight of cross connection control program.

Assistance with sanitary surveys and in responding to DOH report thereon.

King Water Company

Water System Management and Services Agreement

Fees

For the services listed in Exhibit B, this Agreement's first year fees will be, as follows:

A monthly fee of \$970.00 for Operations, Treatment System Maintenance and Documentation and Reports; the fees are due 30 days from date of billing.

Bacteria testing is \$28 per test, which includes a sampling fee, and \$28 for any repeat testing that may be required. Nitrate testing is \$25; other tests will be rebilled to Customer at the current rates, which will be dependant on the third party cost of each type of test being conducted.

The current charge for chlorine is \$47.35 per barrel.

Labor rates:

- Emergency call-outs on weekends and holidays will be billed at \$80.00 per person, per hour.
- Emergency call-outs during weekdays, which cannot be accommodated as part of our normal round schedule, will be billed at \$70.00 per person, per hour, for field staff.
- Our normal hourly rate is \$53.00 per hour for field personnel and \$73.50 per hour for our Operations Manager.
- Repairs requiring the use of the backhoe will be billed at \$90 per half day, plus labor.
- Reservoir cleaning is based on the amount of time to set up and leave a site, plus the time to clean the reservoir. For safety reasons, two personnel must be on site while the reservoir is being cleaned. Use of the pressure washer is charged at \$60.00 per day.

Meter reading services are \$1.60 per meter read, currently read at the end of each calendar quarter. There will be a one-time charge, based on time and materials, for setting up a meter reading book.

Charges for water billing and administrative services will be \$775.00 per month for a quarterly billing. A fee of \$15.00 is charged for sending out each certified letter and \$0.65 per water bill (\$0.71 if printed on back also) mailed to cover the costs of postage and stationary. Time spent in excessive account analysis and other activities associated with collection of balances due will be billed at \$52.00 per hour, based on time expended. A one-time set up charge, based on time spent, may be charged for account set up if the time exceeds one hour.

Labor rates and other fees will be subject to annual reviews on January 1st. Price increases from independent third parties, such a certified laboratories and suppliers, will be passed on as and when incurred.

Scatchet Head Water District

Job Title:	Facilities Maintenance Manager	Job Category:	Onsite
Department/Group:		Job Code/ Req#:	
Location:	Scatchet Head Water District 7906 Guemes Clinton WA	Travel Required:	some
Level/Salary Range:	\$20.00/hour	Position Type:	Part time – 30 hours/month
HR Contact:		Date Posted:	
Will Train Applicant(s):		Posting Expires:	
External Posting URL:			
Applications Accepted By:			
FAX OR EMAIL:		MAIL:	
Job Description			
<p>ROLE AND RESPONSIBILITIES</p> <p>Water: Reads District Water meters Reports Leaks to SMA Delivers Notices to District Customers Assist SMA on Customer service calls as requested</p> <p>Maintenance: Cleans District buildings Minor repairs / painting as needed Painting of buildings as needed Provide oversight of onsite contractors</p> <p>Landscaping: Maintains landscape at the District properties Keeps water meter boxes clear Keeps line valves clear Keeps water vaults, blow offs and air-vac boxes clear Maintains Irrigation system from backwash pond</p> <p>Safety- Follows all OSHA Safety regulations</p> <p>(SMA- Satellite Management Agency)</p>			
Reviewed By:	Name	Date:	Date
Last Updated By:	Name	Date/Time:	Date/Time

ISLAND COUNTY - FRANCHISE AGREEMENT RENEWAL FILES

ISLAND COUNTY PUBLIC WORKS DEPARTMENT

P.O. Box 5000
Coupeville, WA 98239-5000



Phone: 360/679-7331
From Carnation: 360/629-4322
From S. Whidbey: 360/321-5111
FAX: 360/678-4550

ROADS DIVISION

William E. Oakes, P.E., Director/County Engineer

Steve Marx, Asst. Director

Connie Bowers, P.E., Asst. County Engineer

February 8, 2018

Scatchet Head Water District
7906 Guemes Avenue
Clinton, WA 98236

RE: Renewal of Franchise No. 010(1)
Scatchet Head Water District

To Whom It May Concern;

This is to advise you that the referenced franchise which covers the water lines located in the right-of-way of all County roads in the Plat of Scatchet Head, all existing divisions will expire on February 22, 2018. Please execute the enclosed renewal application for franchise and return it to the Island County Engineering Department. We will need copies of the following documents submitted with your renewal application:

1. Articles of Incorporation > None
2. By-laws of organization > None
3. Listing of Board members, including phone numbers ✓
4. Name and phone number of person/company responsible for maintaining system ✓
5. Engineered asbuilt drawings of existing system, on file ✓
6. Certificate of Liability naming Island County as an additional insured, and ✓
7. Renewal application fee and recording fee. ✓

A review of the application by various departments and a public hearing before the Board of Island County Commissioners will be necessary prior to approval of the franchise. If you have any questions, you may contact me at (360) 360-678-7960.

Sincerely,

WILLIAM E. OAKES, P.E.
Director/County Engineer
Island County Public Works

By: 
CECILIA A. HERRERA
Senior Office Specialist

/cah

Enclosure: Franchise Renewal Application
Expired Franchise

APPLICATION FOR FRANCHISE

Board of County Commissioners
P.O. Box 5000
Coupeville, Washington 98239



Commissioners:

The undersigned hereby makes application for a Franchise to construct, operate and maintain a water system including pipes, valves, hydrants, flow-offs, controls, cables & other associated appurtenances. along and/or across a following County Road(s) in Island County, Washington all county right-of-ways located within the District boundaries as described on Exhibit A.

This franchise is requested to extend for a period of time as deemed appropriate by the Board of Island County Commissioners.

360-678-5336
Phone

360-579-7044
Phone

E-Mail Address (if available)

3/8/18
Date

Scatchet Head Water District
Corporation / Association / Name

Duffy Schoeler
Contact Name

Po Box 2243
Address

Oak Harbor, WA 98277
Address

[Signature]
Signature



NOTE: If applicant is a corporation, corporate name should be stated. Application shall be signed by an officer of the corporation. This application is to be executed by the owner(s) of the proposed facility. One copy of any exhibits or maps should be attached to the application.

APPLICATION & PROCESSING FEE: (Make Checks payable to Island County Public Works)

- _____ \$527.36 for New / Expanding Water / Sewer / Gas / Utility Line
- _____ \$618.00 for Cable System
- _____ **\$403.76 for Renewal of Franchise**
- _____ \$154.50 for Assignment/Transfer of Franchise
- \$75.00 for Recording Fees (All Franchises subject to Recording Fees)

Saratoga Water District Franchise Renewal; No. 010(1)

Commissioners:

Duffy Schoeler (360) 579-7044

Dave Mullins (206) 794-4747

Loretta Collar (360) 579-4435

Water Manager:

King Water Company (360) 678-5336

Bill Benshoof – District Manager (360) 579-2462

Enduris
EVIDENCE OF COVERAGE

INSURED/PARTICIPANT:
Scatchet Head Water District
PO Box 2243
Oak Harbor, WA 98277

MEMORANDUM#: 2018-00-455

EFFECTIVE: September 1, 2017 through August 31, 2018
This is to certify that the Memorandum of Coverage has been issued to the Insured/Participant for the period indicated.

CERTIFICATE HOLDER:
Island County Public Works Department
PO Box 5000
Coupeville, WA 98239-5000

The Evidence of Coverage does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.

COVERAGE:

	OCCURANCE	AGGREGATE
COMPREHENSIVE GENERAL LIABILITY		
<i>Professional Liability</i>	\$1,000,000	\$1,000,000
<i>Personal Liability</i>	\$1,000,000	\$1,000,000
<i>Products – Complete Operation</i>	\$1,000,000	\$1,000,000
AUTO LIABILITY		
<i>Combined Single Limit; Hired and Non-Owned; Temporary Substitute</i>	N/A	N/A
CRIME BLANKET COVERAGE WITH FAITHFUL PERFORMANCE OF DUTY		
<i>Per Occurrence Aggregate</i>	N/A	N/A
PROPERTY/MOBILE EQUIPMENT/BOILER AND MACHINERY		
<i>Property</i>		
<i>Mobile Equipment</i>	N/A	N/A
AUTOMOBILE PHYSICAL DAMAGE	N/A	N/A
OTHER	N/A	N/A

CANCELLATION:

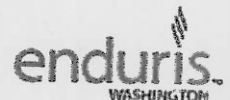
Should any of the above described coverage be cancelled before the expiration date of thereof. Notice will be delivered in accordance with the provisions of the MOC.

MEMO:

Island County is an additional covered party in respects to the Franchise Agreement, No. 010(1).



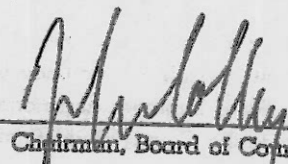
Authorized Representative
3/9/2018




6. Upon failure, neglect or refusal of the holder to immediately do and perform any change, removal, relaying or relocating of said water line, or any repairs or reconstruction of said highway herein required of the holder, the County may undertake and perform such requirement and the cost and expense thereof shall be immediately repaid to the County by the holder.
7. Any breach of any of the conditions and requirements herein made, or failure on the part of the holder of this franchise to proceed with due diligence and in good faith after its acceptance, with construction work hereunder, shall subject this franchise to cancellation after a hearing before the County Commissioners, of which said hearing the holder shall be given at least ten days written notice, if at that time the holder is a resident and doing business in the State of Washington, otherwise by publishing a notice of said hearing once a week for two consecutive weeks in a newspaper of general circulation in Island County, Washington, the last publication to be at least ten days before the date fixed for said hearing.
8. This franchise is not exclusive and the County reserves the right to grant franchises to other persons or companies to use the highway or any part thereof covered by this franchise for the same purpose as herein authorized, or for any other purpose authorized by law.
9. The granting of this franchise shall place no obligation upon the County Road Engineer and/or the County Commissioners to warrant or defend the rights hereby granted.
10. In constructing, operating, maintaining and repairing said water line the holder shall conform to any requirements made by the County Road Engineer, or any County department or officers authorized to supervise and regulate such work and utility for the protection and safety of the public.
11. The construction that is authorized through the granting of this franchise shall be commenced within one year from the date hereof; otherwise the franchise shall be null and void and terminated upon notice as provided by law. Time is the essence of this provision.
12. This franchise is granted under the provisions and subject to the conditions and requirements of Chapter 53, Session Laws of the State of Washington for the year 1937, as amended.
13. No assignment or transfer of this franchise in any manner whatsoever shall be valid nor vest any rights hereby granted until the County Road Engineer shall have been furnished with written evidence of such transfer or certified copies thereof, together with written acceptance of the terms of the franchise by the Assignee, and unless and until the County Commissioners shall have granted their consent in writing to such assignment or transfer. Failure to comply with this provision shall be cause for cancellation as herein provided.
14. The holder shall, within twenty (20) days from receipt of a copy of this order, file with the County Road Engineer at Coupeville his written acceptance of the terms and conditions of this franchise.
15. The Grantee of this Franchise, when contemplating work upon, along, over, under or across county right-of-way, shall first file with the County Engineer his application for permit to do such work. Such applications shall be accompanied by drawings and information as required by the County Engineer.

** See Below

DATED at Coupeville, Washington, this 22nd day of FEBRUARY, 1993


 Chairman, Board of County Commissioners

ATTEST:


 County Auditor and Ex-Officio Clerk of the Board

**16. All construction of the water system must meet the requirements of the County Ordinances and Resolutions for Water Systems current at the time of construction.

Page 2 of 2

17. Vegetation control, all hydrants will be kept clear of brush (suggest a five foot radius) or grass at all times.

FRANCHISE

FRANCHISE NO. 10(1)

In the Matter of the Application of

**THIS FRANCHISE SUPERCEDES
AND CONSOLIDATES FRANCHISE
#10**

Scatchet Head Water District

a corporation, for a franchise to construct, operate and maintain

a water distribution

line along and/or
all County roads in the

across portion(s) of County Road: Plat of Scatchet Head, Div. #1/#3

(there is no Div. #2)

in Sec. 10/15 Twp 28 N. Range 3E W/M, Island

County, Washington.

The application of Scatchet Head Water District

a corporation, its successors and assigns, for a franchise to construct, operate and maintain a water line upon

portion (s) of County Road: all County roads in the Plat of Scatchet Head, all existing divisions

Island County, Washington, having come on regularly for hearing on the 22nd day of February, 1993, before the County Commissioners of Island County, Washington under the provisions of Chapter 53, Laws of 1937, as amended, and it appearing to the County Commissioners that notice of said hearing, as required by law, has been duly given and that it is for the public interest to grant the franchise herein granted; it is

ORDERED that a franchise be and the same hereby is given and granted to Scatchet Head Water District

%Rodgers Sweetland 3662 E. Orcas Dr. Clinton WA 98236

a corporation, its successors and assigns (hereinafter referred to as "the holder") to construct, operate and maintain a water line, together with the necessary laterals and service connections along, and/or across the following described portion of Island

County Road all County roads in the Plat of Scatchet Head, all existing divisions

Name of Road

General Description

Island County, Washington, for a period of ~~(25 years)~~ OR (time to expire on the 22nd day of February, ~~2018~~), subject to the terms and conditions hereinafter enumerated.

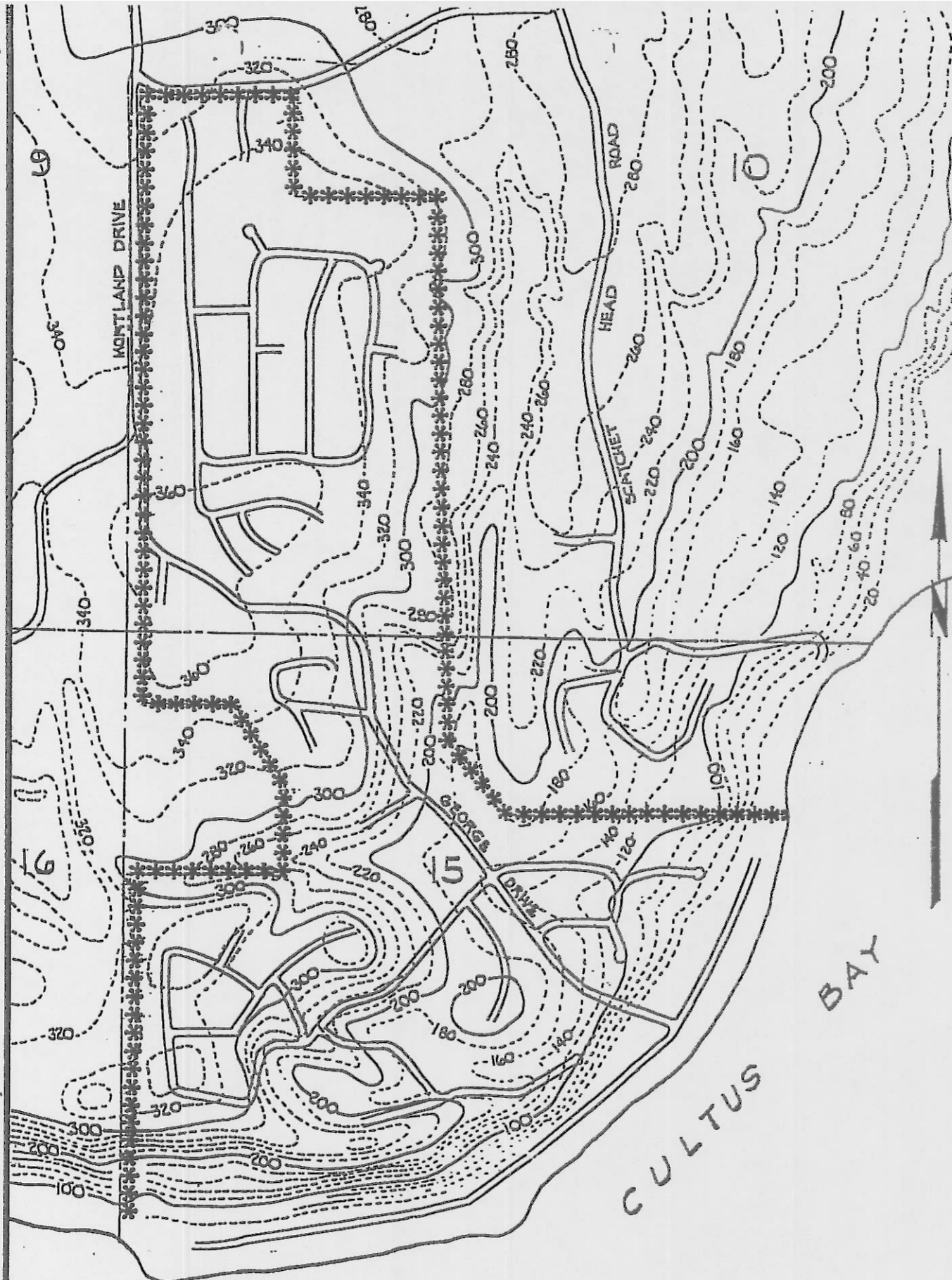
1. Said water line shall at all times be constructed and maintained so as not to interfere with the use of the highway for travel or maintenance.

2. Whenever necessary for the construction, repair, improvement, alteration or relocation of all or any portion of said highway as determined by the County Road Engineer, any or all of said water line shall be immediately removed from said highway, relaid or relocated thereon as required by the County Road Engineer.

3. The work of constructing, removing and relocating any and all of said water line shall be done at the expense of the holder, and with the least possible interference with travel upon the said highway, and to the entire satisfaction and under the supervision of the County Road Engineer and none of such work shall be undertaken or carried on without ten days written notice having been first given to the County Road Engineer.

4. Any and all damage or injury done or caused said highway or any portion thereof in the construction, operation, maintenance or repair of said water line shall be immediately repaired and reconstructed under the supervision and to the satisfaction of the County Road Engineer; and in the event the holder shall fail, neglect or refuse to immediately repair and reconstruct said damage, or injury to said highway, the same may be done by the County and the expense and cost thereof shall immediately be repaid by the holder to the County.

5. The said grantee, its successors and assigns, shall be liable for all damages for which it, they, or the County of Island can become liable for, resulting to any person, persons, associations, corporations or property of any kind by reason of the construction, operation and maintenance of (water system, telephone lines, power lines, etc.) and that the said grantee, its successors and assigns, shall hold the County of Island harmless and free from any and all claims or causes of action of any kind for any and all of said damages, and upon its failure to do so, this franchise shall at once cease and terminate.



SCATCHET HEAD

SCATCHET HEAD WATER DISTRICT
DISTRICT MAP FIGURE

Div #1/#3
(NO DN 2)

Chapter 36.55 RCW
Franchises on roads and bridges

RCW Sections

- 36.55.010 Pipe line and wire line franchises on county roads.
- 36.55.020 Cattleguards, tramroad, and railway rights.
- 36.55.030 Franchises on county bridges.
- 36.55.040 Application — Notice of hearing.
- 36.55.050 Hearing — Order.
- 36.55.060 Limitations upon grants.
- 36.55.070 Existing franchises validated.
- 36.55.080 Record of franchises.

36.55.010
Pipe line and wire line franchises on county roads.

Any board of county commissioners may grant franchises to persons or private or municipal corporations to use the right-of-way of county roads in their respective counties for the construction and maintenance of waterworks, gas pipes, telephone, telegraph, and electric light lines, sewers and any other such facilities.

[1983 c 4 § 36.55.010. Prior: 1961 c 55 § 2; prior: 1937 c 187 § 38, part; RRS § 8450-38, part.]

36.55.020
Cattleguards, tramroad, and railway rights.

Any board of county commissioners may grant to any person the right to build and maintain tramroads and railway-roads upon county roads under such regulations and conditions as the board may prescribe, and may grant to any person the right to build and maintain cattleguards across the entire right-of-way on any county road, under such regulations and conditions as the board may prescribe; PROVIDED, That such tramroad or railway road shall not occupy more than eight feet of the county road upon which the same is built and shall not be built upon the roadway of such county road nor in such a way as to interfere with the public travel thereon.

[1983 c 4 § 36.55.020. Prior: 1941 c 138 § 1; 1937 c 187 § 39; Rem. Supp. 1941 § 8450-39.]

36.55.030
Franchises on county bridges.

Any board of county commissioners may grant franchises upon bridges, trestles, or other structures constructed and maintained by it, severally or jointly with any other county or city or town of this state, or jointly with any other state or any county, city or town of any other state, in the same manner and under the same provisions as govern the granting of franchises on county roads.

[1983 c 4 § 36.55.030. Prior: 1937 c 187 § 40; RRS § 8450-40.]

36.55.040
Application — Notice of hearing.

On application being made to the county legislative authority for franchise, it shall fix a time and place for hearing the same, and shall cause the county auditor to give public notice thereof at the expense of the applicant, by posting notices in three public places in the county seat of the county at least fifteen days before the day fixed for the hearing. The county legislative authority shall also publish a like notice two times in the official newspaper of the county, the last publication to be not less than five days before the day fixed for the hearing. The notice shall state the name or names of the applicant or applicants, a description of the county roads by reference to section, township and range in which the county roads or portions thereof are physically located, to be included in the franchise for which the application is made, and the time and place fixed for the hearing.

[1985 c 489 § 48; 1983 c 4 § 36.55.040. Prior: 1981 c 55 § 3; prior: 1937 c 187 § 38, part; RRS § 6450-38, part.]

36.55.050

Hearing — Order.

The hearing may be adjourned from time to time by the order of the board of county commissioners. If, after the hearing, the board deems it to be for the public interest to grant the franchise in whole or in part, it may make and enter a resolution to that effect and may require the applicant to place his or her utility and its appurtenances in such location on or along the county road as the board finds will cause the least interference with other uses of the road.

[2009 c 549 § 4094; 1983 c 4 § 36.55.050. Prior: 1981 c 55 § 4; prior: 1937 c 187 § 38, part; RRS § 6450-38, part.]

36.55.060

Limitations upon grants.

(1) Any person constructing or operating any utility on or along a county road shall be liable to the county for all necessary expense incurred in restoring the county road to a suitable condition for travel.

(2) No franchise shall be granted for a period of longer than fifty years.

(3) No exclusive franchise or privilege shall be granted.

(4) The facilities of the holder of any such franchise shall be removed at the expense of the holder thereof, to some other location on such county road in the event it is to be constructed, altered, or improved or becomes a primary state highway and such removal is reasonably necessary for the construction, alteration, or improvement thereof.

(5) Counties shall, in the predesign phase of construction projects involving relocation of sewer and/or water facilities, consult with public utilities operating water/sewer systems in order to coordinate design.

[2007 c 31 § 6; 1983 c 4 § 36.55.060. Prior: 1981 c 55 § 5; prior: 1937 c 187 § 38, part; RRS § 6450-38, part.]

36.55.070

Existing franchises validated.

All rights, privileges, or franchises granted or attempted to be granted by the board of county commissioners of any county prior to April 1, 1937, when such board of county commissioners was in regular or special session and when the action of such board is shown by its records, to any person to erect, construct, maintain, or operate any railway or poles, pole lines, wires, or any other thing for the furnishing, transmission, delivery, enjoyment, or use of electric energy, electric power, electric light, and telephone connection therewith, or any other matter relating thereto; or to lay or maintain pipes for the distribution of water, or gas, or to or for any other such facilities in, upon, along, through or over any county roads, are confirmed and declared to be valid to the extent that such rights, privileges, or franchises specifically refer or apply to any county road or county roads, or to the extent that any such county road has prior to April 1, 1937, been actually occupied by the bona fide construction and operation of such utility, and such rights, privileges, and franchises hereby confirmed shall have the same force and effect as if the board of county commissioners prior to the time of granting said rights, privileges, and franchises, had been specifically authorized to grant them.

[1983 c 4 § 36.55.070. Prior: 1937 c 187 § 41; RRS § 6450-41.]

36.55.080

Record of franchises.

The board of county commissioners shall cause to be recorded with the county auditor a complete record of all existing franchises upon the county roads of its county and the auditor shall keep and maintain a currently correct record of all franchises existing or granted with the information describing the holder of the franchise, the purpose thereof, the portion of county road over or along which granted, the date of granting, term for which granted, and date of expiration, and any other information with reference to any special provisions of such franchises.

[1983 c 4 § 36.55.080. Prior: 1937 c 187 § 42; RRS § 6450-42.]

STATE OF WASHINGTON
COUNTY OF ISLAND

REGARDING UTILITY FRANCHISE APPLI- }
CATIONS - WATER & SEWER

RESOLUTION NO. R-45-84

WHEREAS, R.C.W. 36.55 regulates utility franchises on county roads; and

WHEREAS, upon receipt of an application for franchise, the Board of Commissioners is to fix a time and place for hearing same; and

WHEREAS, it is within the authority of the Board of Commissioners to determine/specify the contents of a complete application as a prerequisite of scheduling the hearing required by R.C.W. 36.55.040; and

WHEREAS, it is in the public's interest for the Board of Commissioners to have before them all pertinent data/plans/approvals prior to their consideration of the approval of a water or sewer franchise;

NOW, THEREFORE, BE IT HEREBY RESOLVED by the Board of County Commissioners that application for franchise for water or sewer facilities will not be deemed complete for processing without the attendant information specified on the attached Exhibit "A".

ADOPTED this 7TH day of MAY, 1984.

BOARD OF COUNTY COMMISSIONERS
ISLAND COUNTY, WASHINGTON

ATTEST:
County Auditor & Ex-Officio
Clerk of the Board

RE: Resolution No. R-45-84
Utility Franchise Applications
(Water & Sewer)

E X H I B I T " A "

1) Water System Application Requirements (Consistent with I.C.C. 13.03 & I.C.C. 11.01):

- a) Approvals and certifications specified in I.C.C. 13.03.040.
- b) Well site approval, per I.C.C. 13.03.050.
- c) Water system design/location considerations specified in I.C.C. 11.01.080, 11.01.090(m), & 13.03.060.
- d) Engineering information specified in I.C.C. 13.03.070.
- e) Statement of responsibility, consistent with I.C.C. 13.03.080.

In the case of existing systems which have operated without a franchise, a waiver from any of the above may be granted (upon recommendation of the County Engineer) at the discretion of the Board of Commissioners.

2) Sewer System Application Requirements:

- a) Health agency approvals/permits consistent with I.C.C. 8.07B.120, 8.07B.280 and W.A.C. 248-96-075, 248-96-080.
- b) Submittal of approved engineering reports/system design plans.
- c) Management agreements required by law/statements of responsibility.

3) Fulfillment of the requirements of the State Environmental Policy Act, as applicable.

Chapter 12.16

Franchises for Use of County Rights-of-Way³

Sections:

- 12.16.010 Permit for Short Distances
- 12.16.020 Standards for Granting Franchises
- 12.16.030 Standards of Construction
- 12.16.040 Penalty

12.16.010 Permit for Short Distances

The Board of County Commissioners, in lieu of requiring a franchise, may grant a permit to construct or maintain on, over, under, across, or along any county road any water pipe, gas pipe, oil pipeline, telegraph, CATV cable, electric light, power lines, sewer, tram, railway, or other such facilities when the same does not extend along such county road for a distance of greater than five-hundred (500) feet and the system is less than one (1) mile in total length, whether on public and/or private property. The Board of County Commissioners through their agent, the county engineer, may require such information as it deems necessary in the application for any such permit and may grant or withhold the permit within its discretion. Any permit granted may be cancelled at any time and any facilities remaining on the right-of-way of such county road after thirty (30) days' written notice of such cancellation shall be an unlawful use and obstruction.

(Ord. 916, February 1, 1971, vol. 13, p. 421; amended by Ord. R-25-91, July 1, 1991, vol. 32, p. 452)

12.16.020 Standards for Granting Franchises

No franchise shall be granted unless it is in the public interest which includes consistency of the proposed use with the Island County Comprehensive Plan.

(Ord. R-25-91, July 1, 1991, vol. 32, p. 452)

12.16.030 Standards of Construction

All construction or maintenance of facilities pursuant to franchises and permits issued pursuant to RCW 36.55 and this chapter shall be done in accordance with standards and regulations in force in this county at the time of the granting of the franchise or permit.

(Ord. 916, February 1, 1971, vol. 13, p. 421)

12.16.040 Penalty

- A. Any person, firm, or corporation who shall construct or maintain on, over, under, across, or along any county road any water pipe, flume, gas pipe, oil pipeline, telegraph, telephone, CATV cable, electric light, or power lines, sewer, tram,

³ For statutory provisions authorizing the grant of franchise, see RCW 36.55.

railway, or other such facilities, without having first obtained and having at all times

12.16.040

ROADS AND BRIDGES

in full force and effect a franchise or permit to do so in the manner provided by law, shall be guilty of a misdemeanor. Each day of violation shall be a separate and distinct offense.

- B. Any person, firm, or corporation failing to remove the facilities after receipt of a written notice of cancellation of a franchise or permit shall be guilty of a misdemeanor. Each day of violation shall be a separate and distinct offense.

(Ord. 916, February 1, 1971, vol. 13, p. 421; amended by Ord. R-25-91, July 1, 1991, vol. 32, p. 452)

Chapter 12.17

(Reserved)

Chapter 12.18

(Reserved)

Chapter 12.19

(Reserved)

Chapter 12.20

Road Closures and Restrictions⁴

Sections:

12.20.010 Authority to Close or Restrict County Roads

12.20.020 Load Restrictions

12.20.030 Posting

12.20.010 Authority to Close or Restrict

The Island County Engineer and/or the county road supervisors within their separate road districts are authorized to determine that an emergency exists as provided in RCW 47.48.010 and 47.48.020.

(Res. 917, January 4, 1971, vol. 13, p. 410)

⁴ For statutory provisions regarding road restrictions, see RCW 47.48.010-.020.

SCATCHET HEAD WATER DISTRICT - COVENANTS

RETURN ORIGINAL DOCUMENT TO:

NAME (Print) _____

MAILING ADDRESS _____

DECLARATION OF COVENANT

Know all men by these presents that I (we) the undersigned, owner(s) in fee simple of the land described herein, hereby declare this covenant and place same on record.

I (we), the grantor(s) herein,

_____ am (are) the owner(s) in fee simple of (an interest in) the following described real estate situated in _____ County, State of Washington, to wit:

on which the grantor(s) owns and operates a well and waterworks supplying water for public use located on said real estate, to wit:

_____ and grantor(s) is (are) required to keep the water supplied from said well free from impurities which might be injurious to the public health.

It is the purpose of these grants and covenants to prevent certain practices hereinafter enumerated in the use of said grantor(s) land which might contaminate said water supply.

NOW, THEREFORE, the grantor(s) agree(s) and covenant(s) that said grantor(s), his (her) (their) heirs, successors and assigns will not construct, maintain, or suffer to be constructed or maintained upon the said land of the grantor(s) and within 100 (one hundred) feet of the well herein described, so long as the same is operated to furnish water for public consumption, any of the following: structures, residences, cesspools, sewers, privies, septic tanks, drainfields, manure piles, garbage of any kind or description, barns, chicken houses, rabbit hutches, pigpens, or other enclosures or structures for the keeping or maintenance of fowls or animals, or storage of liquid or dry chemicals, herbicides, or insecticides.

These covenants shall run with the land and shall be binding on all parties having or acquiring any right, title, or interest in the land described herein or any part thereof, and shall inure to the benefit of each owner thereof.

WITNESS _____ hand _____ this _____ day of _____, 20_____

_____ (Seal)

_____ (Seal)

Grantor(s)

State of Washington

County of _____) ss

I, the undersigned, a Notary Public in and for the above named County and State, do hereby certify that on this _____ day of _____, 20_____, personally appeared before me _____ to me known to be the individual _____ described in and who executed the within instrument, and acknowledge that he (they) signed and sealed the same as _____ free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal the day and year last above written.

(SIGNATURE) _____

(NAME - PRINTED) _____

Notary Public in and for the

State of Washington residing at _____

My Commission Expires: _____

RETURN ORIGINAL DOCUMENT TO:

NAME (Print) _____

MAILING ADDRESS _____

RESTRICTIVE COVENANT

The grantor(s) herein, _____
is (are) the owner(s) of (an interest in) the following described real estates situated in
_____ County, State of Washington, to wit:

The grantee(s) herein, _____ own(s) and operate(s) a well and
waterworks supplying water for public use, located upon the following described real estates situated in
_____ County, State of Washington, to wit:

which well and waterworks is in close proximity to the land of the grantor(s), and said grantee(s) is (are)
required to keep the water supplied from said well free from impurities which might be injurious to the public
health.

It is the purpose of these grants and covenants to prevent certain practices hereinafter enumerated in the use
of the said grantor(s) land which might contaminate said water supply.

NOW, THEREFORE, the grantor(s), agree(s) and covenant(s) that said grantee(s), its successors and assigns,
said covenants to run with the land for the benefit of the land of the grantee(s), that said grantor(s), its (their)
heirs, successors and assigns will not construct, maintain or suffer to be constructed or maintained upon the
said land of the grantor(s) and within 100 (one hundred) feet of the well of the grantee(s), so long as the same
is operated to furnish water for public consumption, any of the following: structures, residences, cesspools,
sewers, privies, septic tanks, drainfields, septic transport lines, manure piles, garbage of any kind or
description, barns, chicken houses, rabbit hutches, piggpens, or other enclosures or structures for the keeping
or maintenance of fowls or animals, or storage of liquid or dry chemicals, herbicides, or insecticides.

WITNESS _____ hand this _____ day of _____, 20____

_____ (Seal)

_____ (Seal)

Grantor(s)

State of Washington

County of _____)ss

I, the undersigned, a Notary Public in and for the above named County and State, do hereby certify that on this
_____ day of _____, 20____, personally appeared before me

_____ to me known to be the individual _____ described in and who executed the within instrument, and
acknowledge that he (they) signed and sealed the same as _____ free and voluntary act and deed, for
the uses and purposes therein mentioned.

GIVEN under my hand and official seal the day and year last above written.

(SIGNATURE) _____

(NAME - PRINTED) _____

Notary Public in and for the State of Washington, residing at

_____ My Commission Expires: _____

SCATCHET HEAD WATER DISTRICT - RESOLUTIONS AND WATER SYSTEM FILES

RESOLUTION NO. 98-5

RE: Accept Scatchet Head Water District's Management and Operations Manual

A **RESOLUTION** of the Board of Commissioner of Scatchet Head Water District, Island County, Washington, Commissioners David Morphew, E. C. Duffy Schoeler, and Joachim Gerlach; being present at the regular water district meeting held this day Thursday October 1st, 1998 moved to accept and adopt the Management and Operations Manual for Scatchet Head Water District;

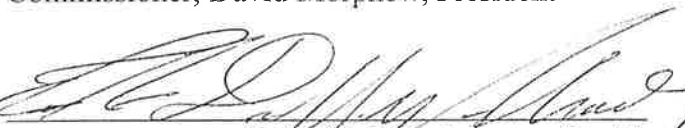
WHEREAS; the Commissioners did unanimously agree to accept and adopt the Management and Operations Manual for Scatchet Head Water District;

NOW, THEREFORE; it is hereby resolved by the Board of Commissioners of Scatchet Head Water District that the Management and Operations Manual for Scatchet Head Water District is adopted and will be sent to Washington State Department of Health;


UNANIMOUSLY APPROVED by the Board of Commissioners of the Scatchet Head Water District, Island County, Washington, at a regular meeting held on this 1st day of October 1998.



Commissioner; David Morphew, President




Commissioner; E. C. Duffy Schoeler, Vice President



Commissioner; Joachim Gerlach, Secretary

CERTIFICATION

I, Terri Campbell, Auditing/financial Officer of Scatchet Head Water District, do hereby certify that the document attached hereto is a true and correct copy of Resolution No. 98-5 of the said Board, duly adopted at a regular meeting thereof held on the 1st day of October 1998.



Terri Campbell, Auditing/Financial Officer
Scatchet Head Water District

ARTICLE

III

F

MISSISSIPPI

Div. 1, and Scratch Head Div. 2

W. E. E. E.

Washington

Dedication

KNOW ALL MEN BY THESE PRESENTS that we the undersigned, owners in fee simple of the land hereby platted, do hereby declare this plat and dedication to the public use of the "Community" forever all streets shown thereon and the use thereof for any and all "Community" purposes not inconsistent with the use thereof for "Community" highway purposes also the right to make all necessary slopes for cuts and fills on the lots shown upon this plat in the original reasonable grading of the streets hereon; also the right to drain all streets over and across any lot or lots where water might take its natural course after streets are graded.

All LOTS are subject to a five (5) ft. easement along all interior lot lines for drainage and utility purposes. TRACT 'A' access road to beach lots and Tract 'C' park are hereby dedicated to Scratch Head Community Club, for purposes not inconsistent with the use thereof, and SUBJECT to the Articles of Incorporation and By Laws of said Community Club, and the regulations, restrictions, and reservations contained therein.

IN WITNESS WHEREOF we have hereunto set our hand and seal this 20th day of September, A.D. 1965.

Scratch Head Inc.
 Pres. Gordon J. Erickson

Acknowledgment

STATE OF WASHINGTON }
 COUNTY OF ISLAND }
 THIS is to CERTIFY that on this 20th day of September A.D. 1965, before me the undersigned, a Notary Public in and for the State of Washington, D. C.

Water System File Report

SCATCHET HEAD WATER DISTRICT

ID# 76470 ISLAND COUNTY

Contact: SANDRA BODAMER, CONTACT

Ph: (360) 678-5336 (Current as of 9/11/2017)

Print Date: September 11, 2017

Type	Project Name	Sub Date	Approval Date	Construct Date	Sub #	Lots Created	Comments
	SCATCHET HEAD - WATER SYSTEM		08/20/65	06/24/66	65-1352		Recreational development. Provisional approval: "that it can be shown that . . . minimum 350gal per lot per day; further . . . no FF, peak service nor irrigation." 401 or 569 platted lots?
	ENGINEERING REPORT		05/21/74		74-1306		Archived?
	TREATMENT & DIST'N IMPROVEMENTS		04/02/75		75-1305		No const report.
	COMPREHENSIVE PLAN		05/15/78		78-1303		Archived.
	WELL #2		08/14/79	06/11/80	79-1306		Archived.
	300,000 GAL RESERVOIR		09/06/79		79-1307		Ref 38 project. Completed. Archived.
	IMPROVEMENTS		08/04/80	03/04/81	80-1303		Archived.
WP	WATER SYSTEM PLAN & AMENDMENT 5/12/94	03/20/92	07/29/94	07/29/94	92-0316		Source: Well#1- emergency use only; Well#2- 125gpm. Treatment: Gas chlorination. Storage: 2- 7,000gal steel tanks + 300,000gal standpipe. Distn: "Low Zone": gravity from steel tanks. "Intermediate Zone": gravity from Guemes tank w/ PRV stn. "High Zone": gravity from 300K tank. 2- 125gpm transfer pump from 7K tank to 300K. 310+/- = existing connects.
PS	MAIN REPLACEMENTS	10/31/94	01/17/95	02/13/96	94-1021		Dist'n: Replace 2" PVC w/ 6" PVC on - Island Ct, Samish Ct, portion of Orcas Dr.
PS	SCATCHET HILLS DEVELOPMENT	01/25/95	06/01/95	02/24/97	95-0113a		Storage: add 100,000gal (of 443' elev) at Maple Point. Distn: 8" PVC to new lots. 26 new lots
	ENGINEERING CAPACITY		02/25/97	02/25/97	95-0113b		Design: PDD=600gpd/connect Source: Well#2- 146gpm. Treat: Chlorination is flow proportional. Storage: 400,000gal total (230,000gal is needed to maintain 20 psi at highest service). Dist'n: see WSP. 350 = eng capacity
ER	WELL#3	04/04/96	02/25/97	02/25/97	96-0406		Source: Well#3- 246', 66gpm concurrent w/ Well#2- 125gpm; Fe=0.3, Mn=0.127ppm. (Approved based on water right self assessment). Treat: Chlorination; (Fe/Mn at later date).
	WILLIAMSON CONNECTION		03/11/98	03/11/98	98-0003		1 additional connection to an existing platted lot beyond current 350 connection limit due to extenuating circumstances see district's 03/2/98 letter.

SCATCHET HEAD WATER DISTRICT

Print Date: September 11, 2017

ID# 76470 ISLAND COUNTY

Contact: SANDRA BODAMER, CONTACT

Ph: (360) 678-5336 (Current as of 9/11/2017)

Type	Project Name	Sub Date	Approval Date	Construct Date	Sub #	Lots Created	Comments
ER	TEMPORARY HYPOCHLORINATION FACILITY	03/11/98	03/27/98	03/27/98	98-0309a		Source: wells 2 & 3 currently pump thru 2- 7,000gal steel tanks then directly to dist'n. TREAT: Gas chlorination system has been abandoned. New hypochlorinator feed pump injects flow prop (125gpm concurrent well pumping) prior to 2- 3.5k tanks. Target free Cl2 residual 0.35ppm.
	HYPOCHLORINATION				98-0309b		Source: wells 2 & 3 above pump thru dedicated supply line to Guemes Ave 300k standpipe.
	FLUSHING PROGRAM		01/06/98		98-0309c		Until dedicated line to storage is installed, flush system as needed to maintain 0.2ppm in all parts. Include "Performance Report" with monthly Chlorination Report. Refer to 02/20/98 & 09/1/98 letters.
WP	1998 WATER SYSTEM PLAN	11/09/98	03/24/99		98-1103	533	Design: PDD=600gpd/connect. Source: Well#2-125gpm. Well#3-66gpm. Concurrent pumping. (WR limits). Treatment: Hypochlorination- flow prop, injected prior to 2- 7k steel tanks [of=210'] & 2- 125gpm transfer pumps to Guemes tank. Storage: 300k Guemes standpipe [of=445']. 119k Maple Pt standpipe [of=445'](standby). Distn: "High Zone" [220-375'] gravity from Guemes tank. "Intermediate Zone" [140-220'] gravity from Guemes tank w/ PRV stns. "Low Zone" [0-140'] gravity from 2-7k steel tanks. 494=buildable lots (533 total).
	STANDARD WATER MAIN SPECIFICATIONS		03/24/99		98-1103b		AWWA C-104 DI or C-900 PVC pipe.
ER	1999 CAPITAL IMPROVEMENTS	03/05/99	04/13/99		99-0309a		Source: Well#2- new 148gpm pump. Well#3- new 67gpm pump; 215gpm concurrent operation. New 6"D dedicated line to storage. Storage: Guemes Ave reservoir- modify inlet to top of tank. Abandon twin 7,000gal steel tanks. 119Kgal Maple Point Dr reservoir off-line- for emergency use only. Distn: "Main Pressure Zone" Guemes Ave Pump Stn: 4- 5hp bpumps 220gpm ea; FF capacity, 2,120gal ptank, 35/55psi. 2 new PRV stns & replace existing PRV stns.
B	AERATION / FILTRATION / DISINFECTION	03/05/99	04/13/99	08/06/01	99-0309b		Construction chages: Ozone proposed but not installed (Air only); Pre and post chloriation installed to control iron and sulfate reducing bacteria. Approved design included ozonation / filtration / disinfection- Q=240gpm: Venturi injector, 2- 48"D contact tanks, 4- 48"D pressure filters, Birm media. Backwash from bpumps. Hypochlorination: 1 feed pump injects post filtration 50gal soln tank.
	ENG CAPACITY		05/10/00	05/10/00	99-0309c		12/14/05 - approval for 451 connects 5/10/00 - Acknowledge completion of dedicated line to storage & Guemes Ave pump Stn & PRV Stns. 125gpm water right limits well field capacity. Revised capacity calcs based on peak 4 days with additional equalizing storage. 400 = eng capacity. 05/10/2000 letter. 10/22/2002 add'l water right & revised calcs: eng capacity=410

SCATCHET HEAD WATER DISTRICT

Print Date: September 11, 2017

ID# 76470 ISLAND COUNTY

Contact: SANDRA BODAMER, CONTACT

Ph: (360) 678-5336 (Current as of 9/11/2017)

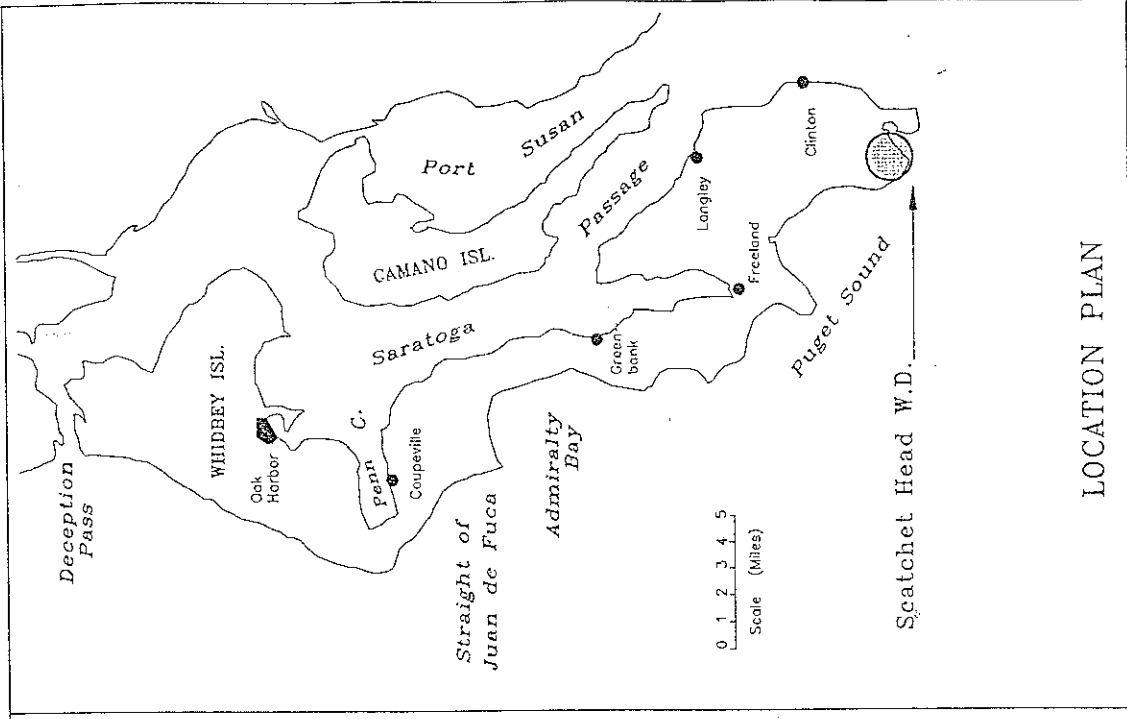
Type	Project Name	Sub Date	Approval Date	Construct Date	Sub #	Lots Created	Comments
B	NEW PRESSURE REDUCING VALVE @ GEORGE/DRIFTWOOD	10/30/06	02/05/07	10/18/07	06-1015		Dual PRV with pressure sustaining valve - located at George Dr and Driftwood Dr. 4" Cla-val (800 gpm / 50 psi) with 100 psi pressure sustaining valve and 1.5" Cla-val (125 gpm / 55 psi).
B	MAPLE POINT RESERVOIR MODIFICATIONS	10/09/09	12/01/09	02/10/11	09-1007		To help move water out of the Maple Point reservoir, a 7 gpm pump with 531 LF of 2" PVC pipe will be used to transfer water from the reservoir into the distribution system. The pump will operate for 12 hours a day, which roughly correlates to 5% of the average daily demand for the system. A pressure switch will also be used to insure that the system pressure remains within acceptable parameters.

- B Engineering Report AND Plans and Specs
- CC Corrosion Control
- CT Contact Time Study
- ER Engineering Report
- GROUP B Group B Approval
- GWI Groundwater under the influence of surface water
- OM Operations and Maintenance Manual

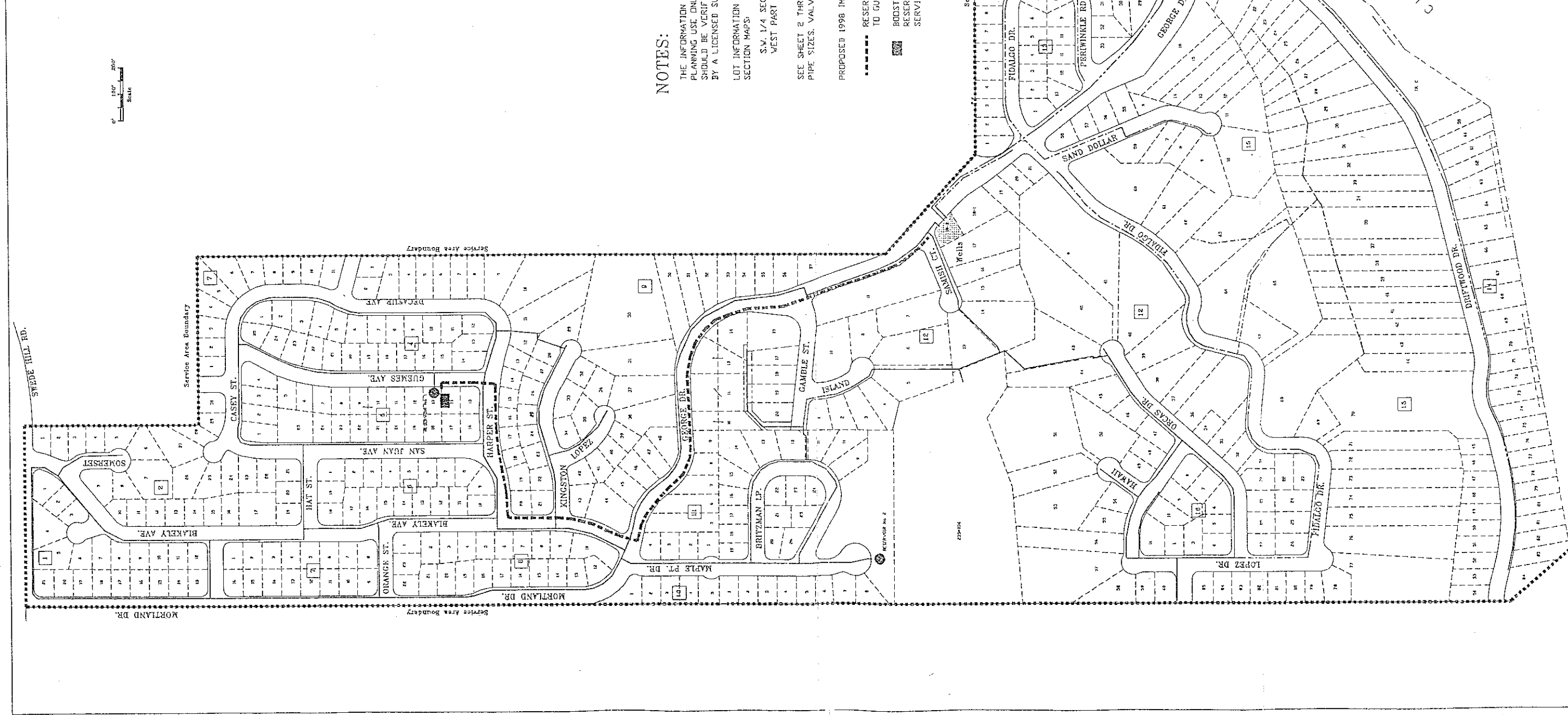
Approved Capacity: 451 Existing Connections: 410 Total Lots Created: 533

APPENDIX B Water System Maps

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LOCATION PLAN



NOTES:

THE INFORMATION GIVEN ON THIS MAP IS INTENDED FOR PLANNING USE ONLY. FOR OTHER USES, THE INFORMATION SHOULD BE VERIFIED BY ISLAND COUNTY RECORDS OR BY A LICENSED SURVEYOR.

LOT INFORMATION COPIED FROM THE FOLLOWING ISLAND COUNTY SECTION MAPS:
 S.W. 1/4 SEC. 10, TWP. 28 N., R. 3 E., V.M.
 WEST PART SEC. 15, TWP. 28 N., R. 3 E., V.M.

SEE SHEET 2 THROUGH 8 FOR 1" = 100' SCALE PLANS SHOWING PIPE SIZES, VALVES, HYDRANTS, ELEVATION CONTOURS, ETC.

PROPOSED 1998 IMPROVEMENTS

- RESERVOIR SUPPLY LINE FROM WELLS TO GUEMES AVE. RESERVOIR
- BOOSTER PUMP STATION AT THE GUEMES AVE. RESERVOIR SITE TO SUPPLY HIGH ELEVATION SERVICE AREA

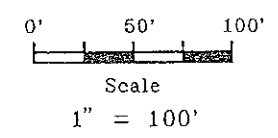
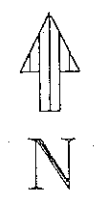
LATEST REVISION: 1/27/98

SCATCHET HEAD WATER DISTRICT
 3792 EAST HUBBLE COURT
 Clinton, Washington 98236

WATER DISTRIBUTION SYSTEM
 COMPREHENSIVE MAP
 Water Service Area
 Proposed 1998 Improvements

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 Job 297 November 1997

SWEDE HILL RD.



Notes:

(COMMON TO ALL SHEETS)

THE INFORMATION GIVEN ON THIS MAP IS INTENDED FOR PLANNING USE ONLY, FOR OTHER USES, THE INFORMATION SHOULD BE VERIFIED BY ISLAND COUNTY RECORDS OR BY A LICENSED SURVEYOR.

LOT INFORMATION COPIED FROM THE FOLLOWING ISLAND COUNTY SECTION MAPS:

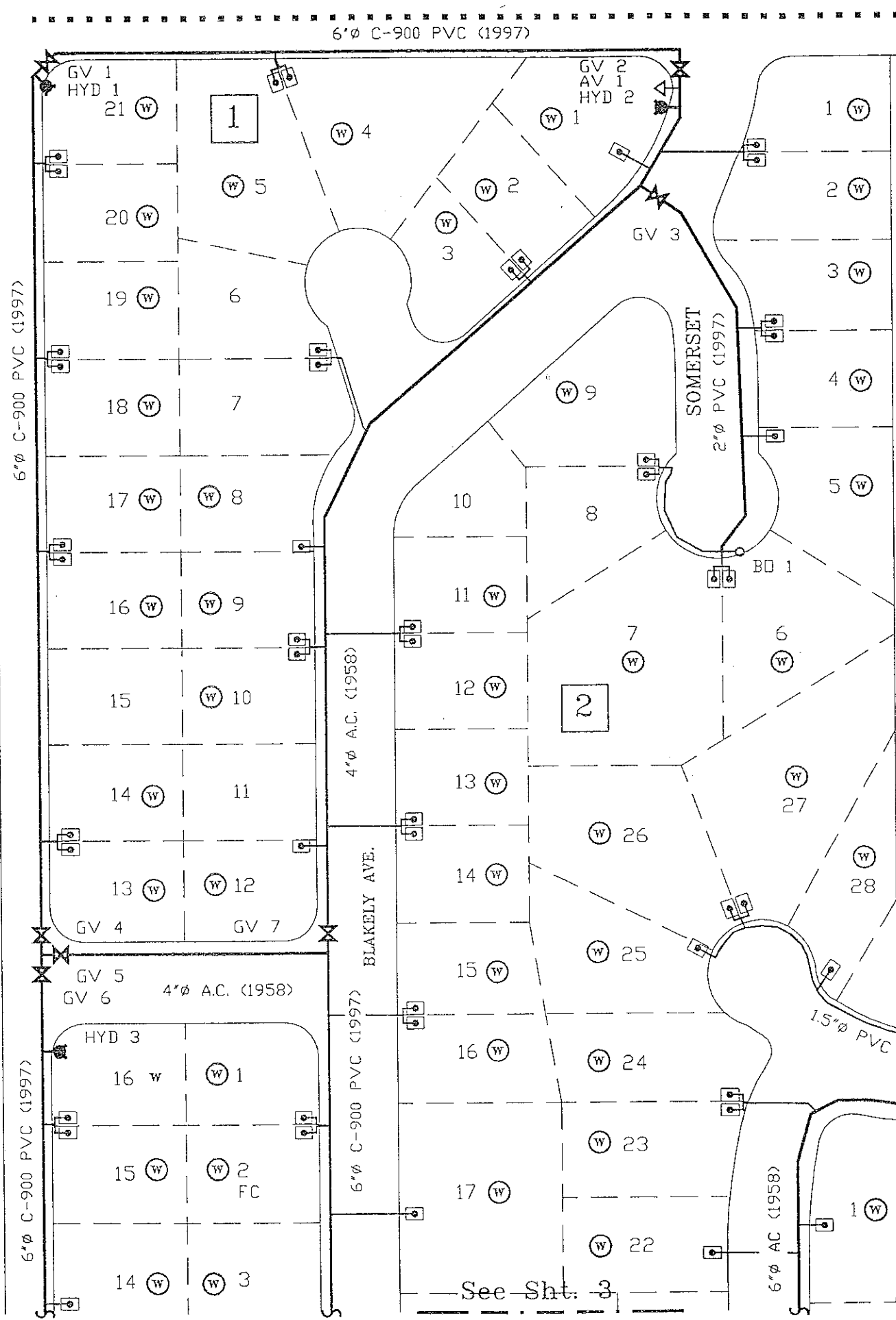
S.W. 1/4 SEC. 10, TWP. 28 N., R. 3 E., W.M.
WEST PART SEC. 15, TWP. 28 N., R. 3 E., W.M.

Legend:

(COMMON TO ALL SHEETS)

- Lot with active water service.
- Lot with inactive water service.
- Service area boundary.
- Water main.
- Water service.
- Water service c/w shutoff and meter setter.
- Gate valve.
- Standpipe / Blow-off.
- Fire hydrant (c/w isolating valves).
- Air release valve.
- Water sample station.
- Field chlorine measurement at house tap by customer.
- Pressure reducing valve in vault.

MORTLAND DR.



See Sht. 3

Latest Revision: 1/27/98

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Coupeville, Washington 98239
Job 297 November 1997

WATER DISTRIBUTION SYSTEM
COMPREHENSIVE MAP

SCATCHET HEAD WATER DISTRICT
3792 EAST HUBBLE COURT
Clinton, Washington 98236

MORTLAND DR.

Service Area Boundary

6"Ø PVC (19--)

6"Ø PVC (19--)

VSS # 1

See Sht. 2

19 20 21

6"Ø AC (19--)
HAT ST.

GV 13
GV 14

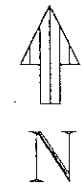
W 5

W 7 FC

VSS # 2

BD 5
(in box)

1" = 100'



Service Area Boundary

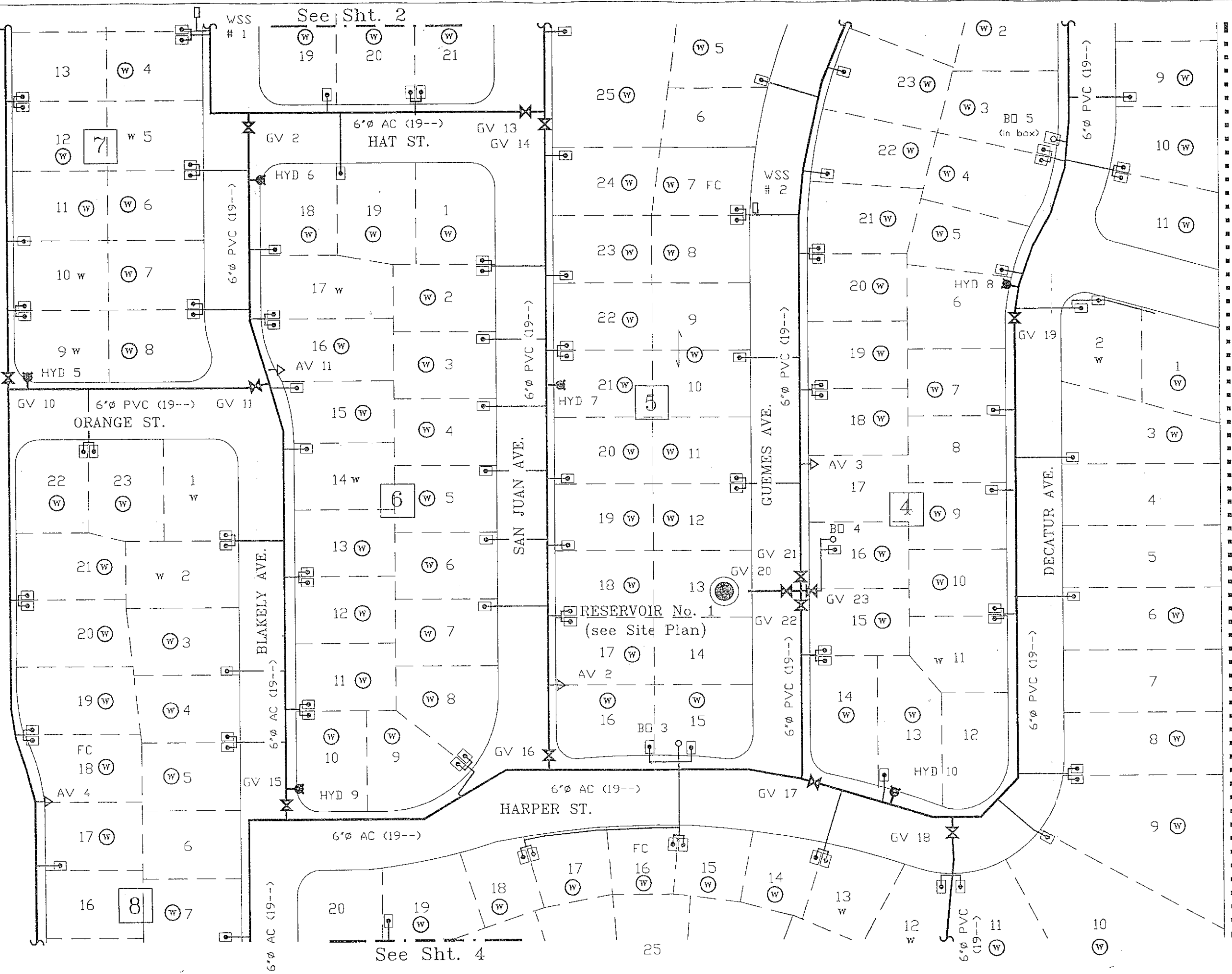
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Job 297 November 1997

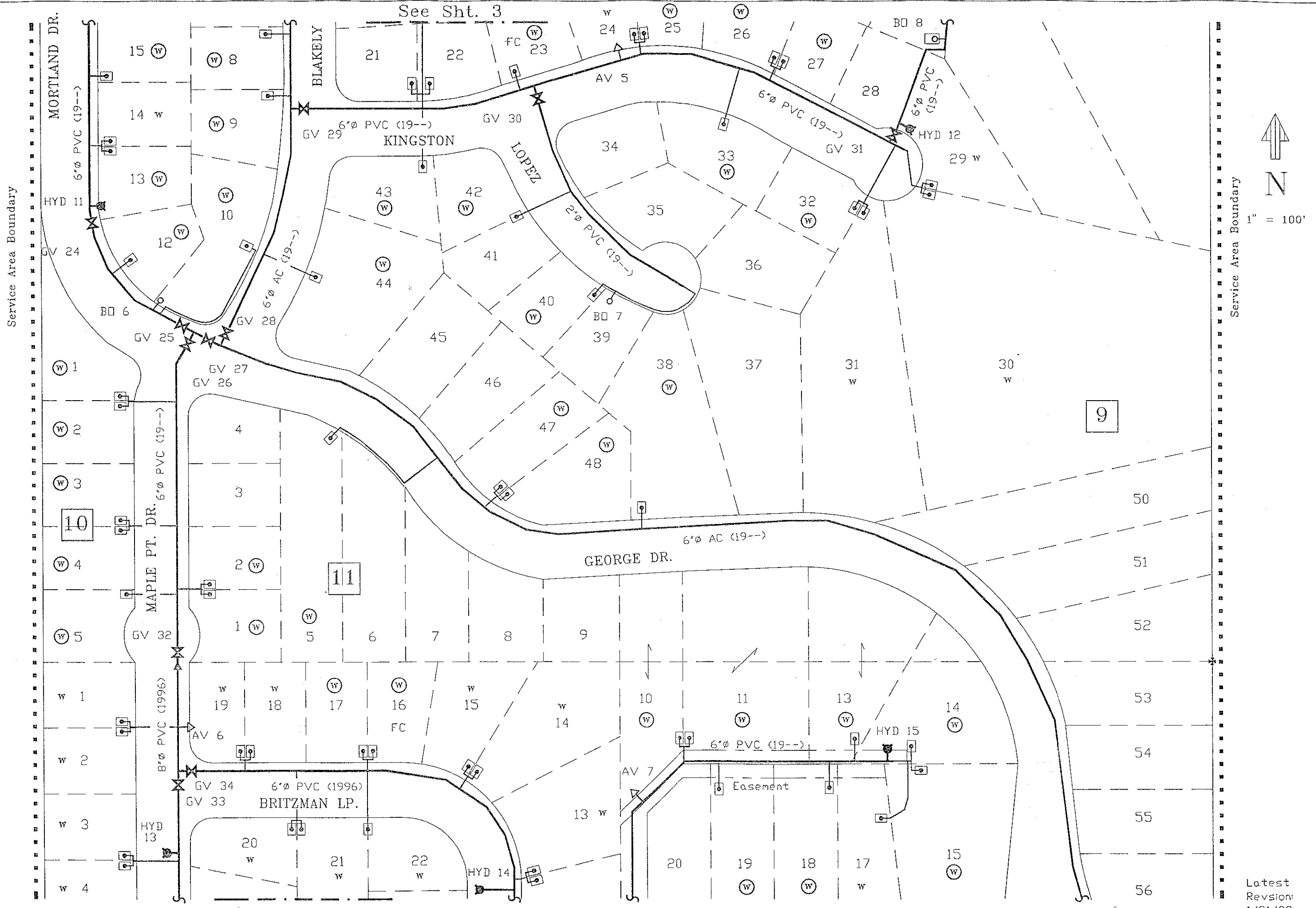
WATER DISTRIBUTION SYSTEM
COMPREHENSIVE MAP

SCATCHET HEAD WATER DISTRICT
3792 EAST HUBBLE COURT
Clinton, Washington 98236

Latest
Revision:
1/31/98

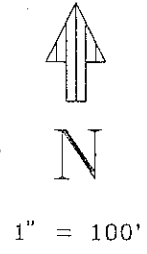
Sht. 3 of 10





See Sht. 5

See Sht. 3

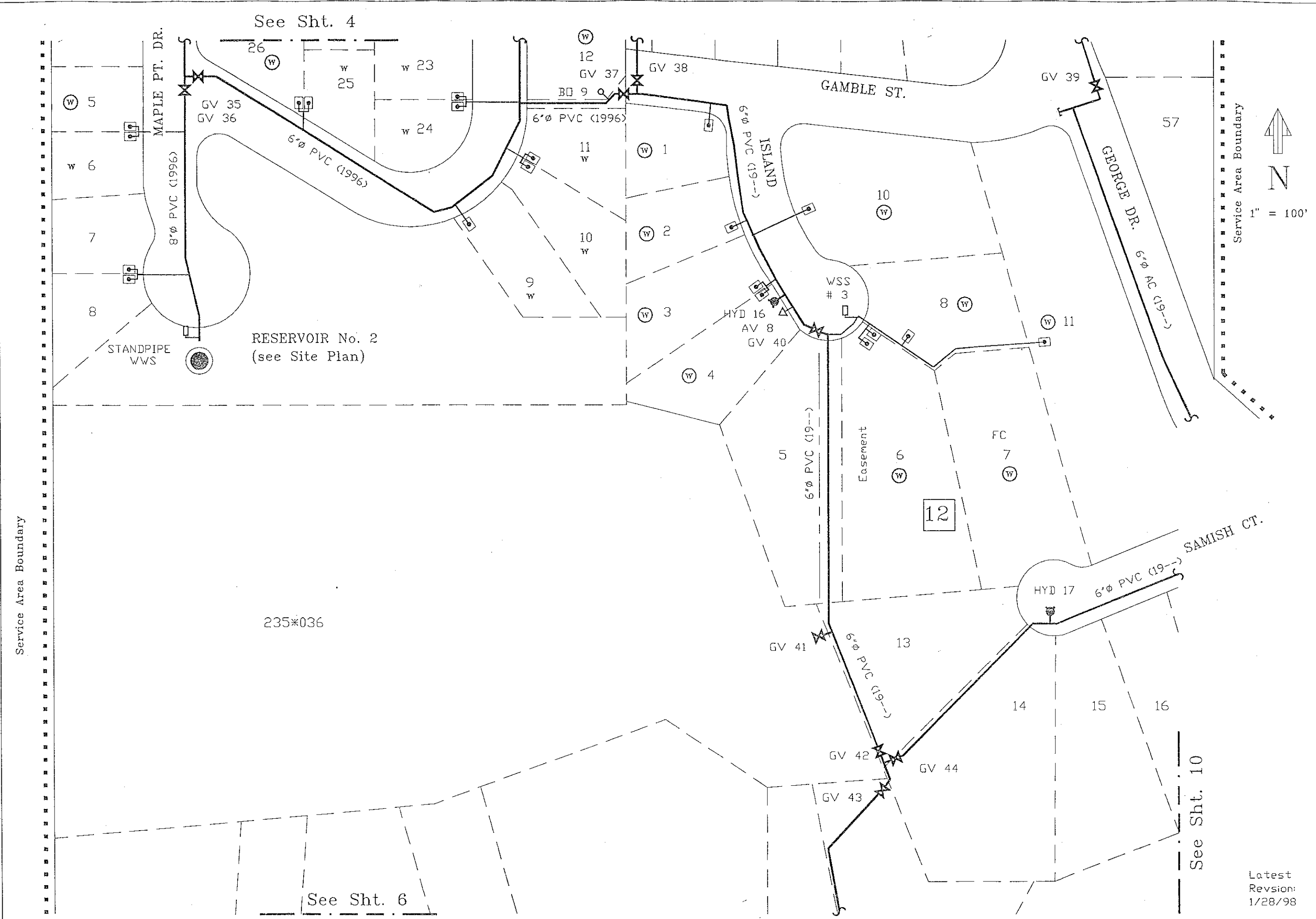


Latest Revision: 1/31/98

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Job 297 November 1997

WATER DISTRIBUTION SYSTEM
COMPREHENSIVE MAP

SCATCHET HEAD WATER DISTRICT
3792 EAST HUBBLE COURT
Clinton, Washington 98236



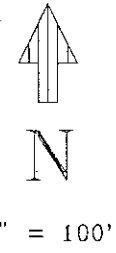
See Sht. 4

RESERVOIR No. 2
(see Site Plan)

235*036

See Sht. 6

See Sht. 10



1" = 100'

Service Area Boundary

Service Area Boundary

Latest
Revision:
1/28/98

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Job 297 November 1997

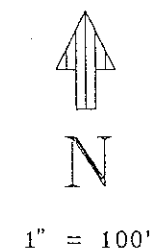
WATER DISTRIBUTION SYSTEM,
COMPREHENSIVE MAP

SCATCHET HEAD WATER DISTRICT
3792 EAST HUBBLE COURT
Clinton, Washington 98236

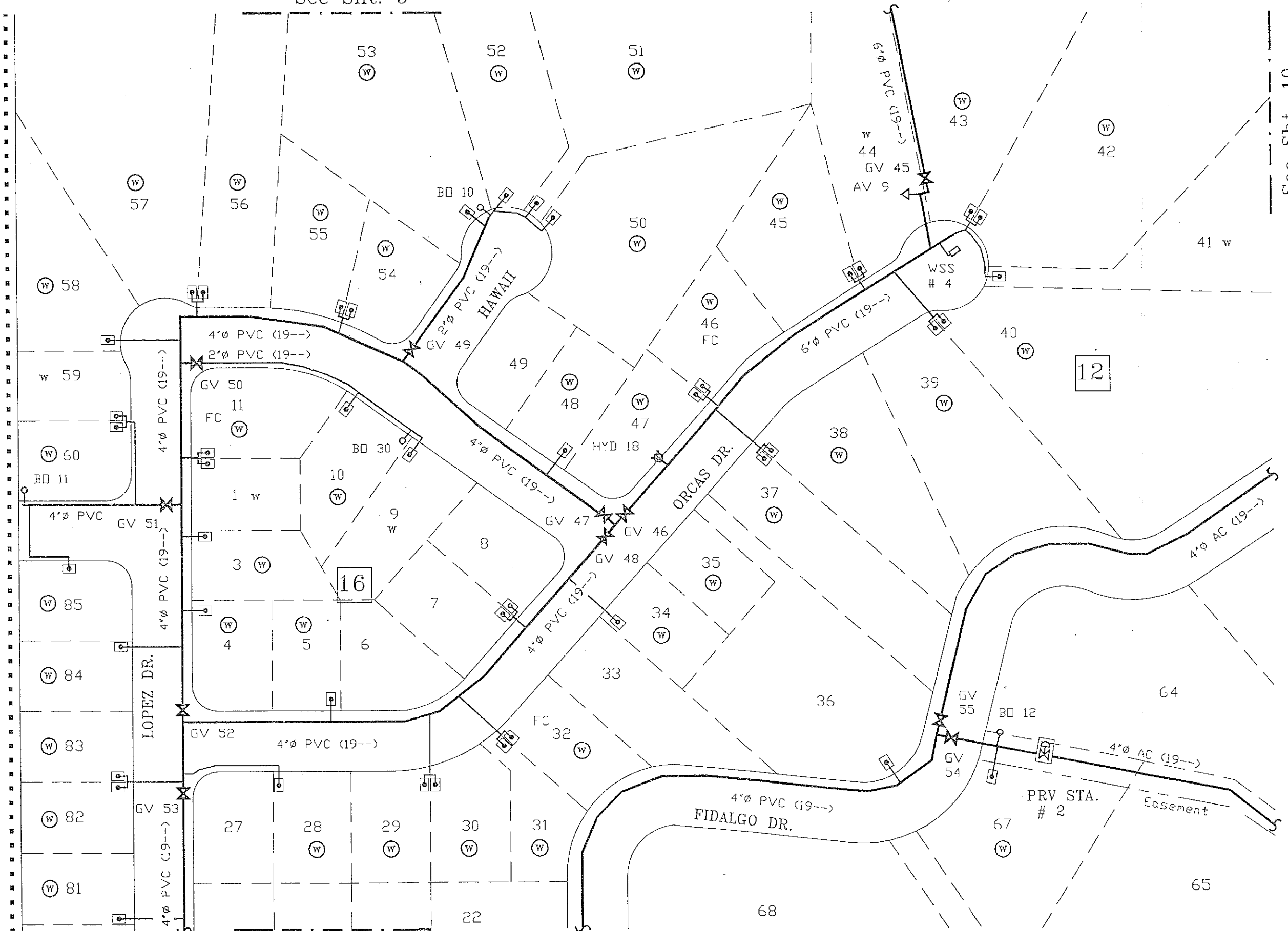
Service Area Boundary

See Sht. 5

See Sht. 10



Latest Revision: 1/31/98



See Sht. 7

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WATER DISTRIBUTION SYSTEM
COMPREHENSIVE MAP

SCATCHET HEAD WATER DISTRICT
3792 EAST HUBBLE COURT
Clinton, Washington 98236

Sht. 6 of 10

Service Area Boundary

See Sht. 6



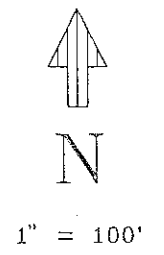
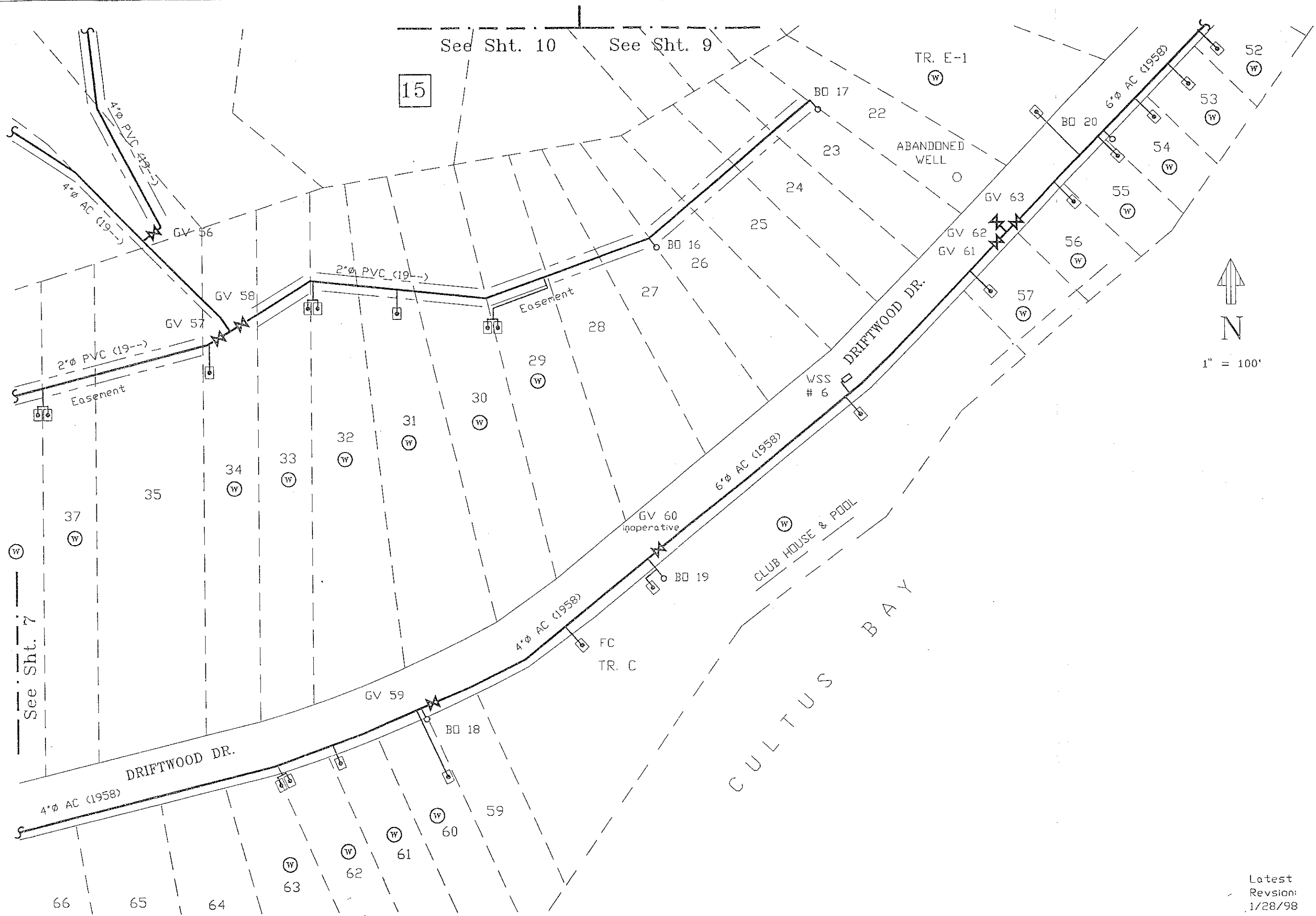
See Sht. 8

Latest Revision: 1/31/98

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WATER DISTRIBUTION SYSTEM
 COMPREHENSIVE MAP

SCATCHEL HEAD WATER DISTRICT
 3792 EAST HUBBLE COURT
 Clinton, Washington 98236



See Sht. 10 See Sht. 9

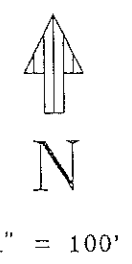
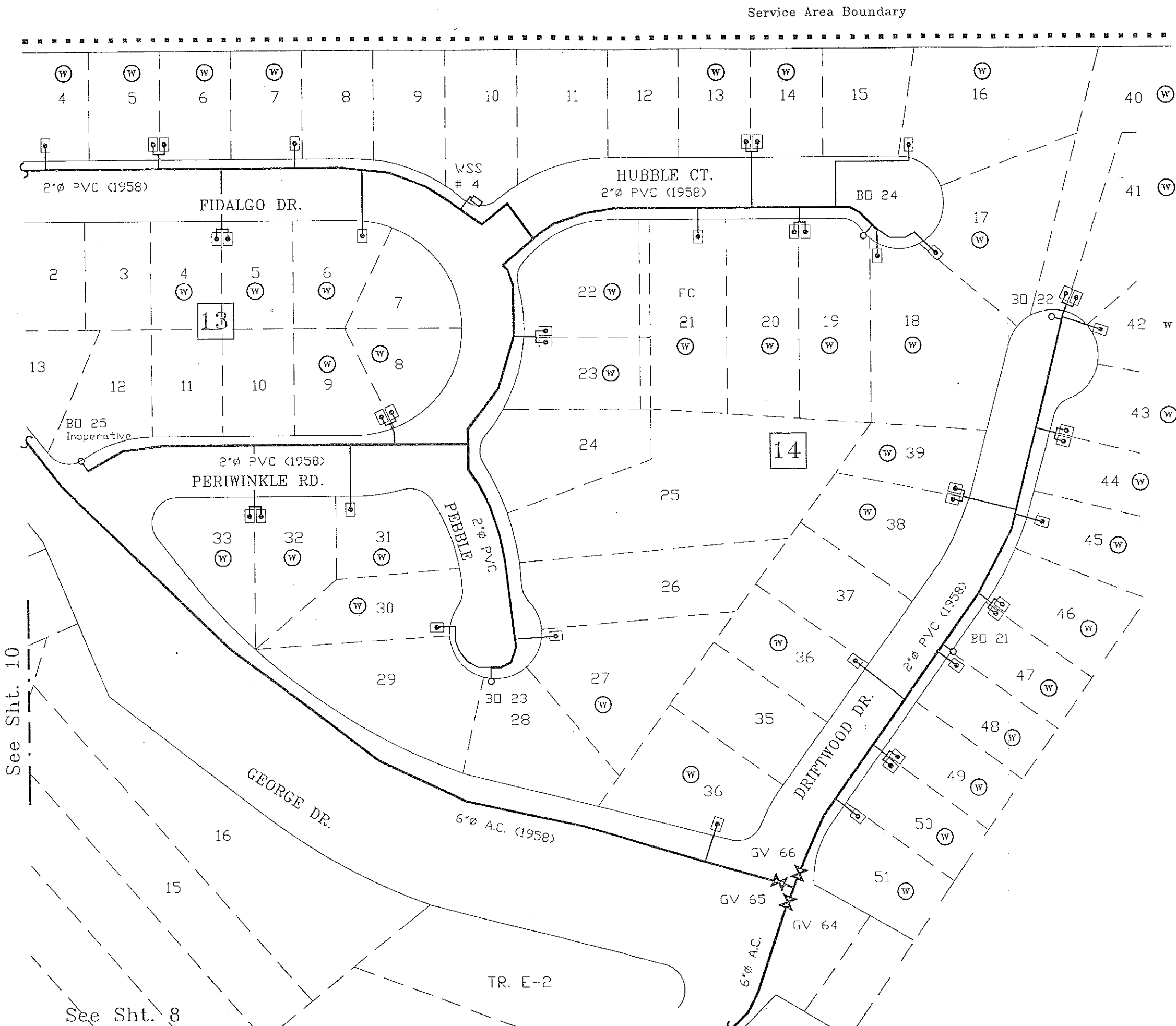
See Sht. 7

Latest
Revision:
1/28/98

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Job 297 November 1997

WATER DISTRIBUTION SYSTEM
COMPREHENSIVE MAP

SCATCHET HEAD WATER DISTRICT
3792 EAST HUBBLE COURT
Clinton, Washington 98236



See Sht. 10

See Sht. 8

Latest Revision: 1/28/98

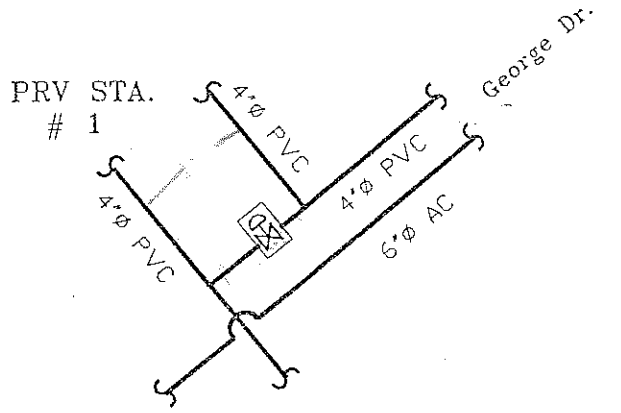
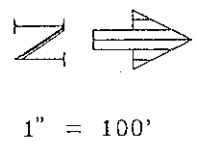
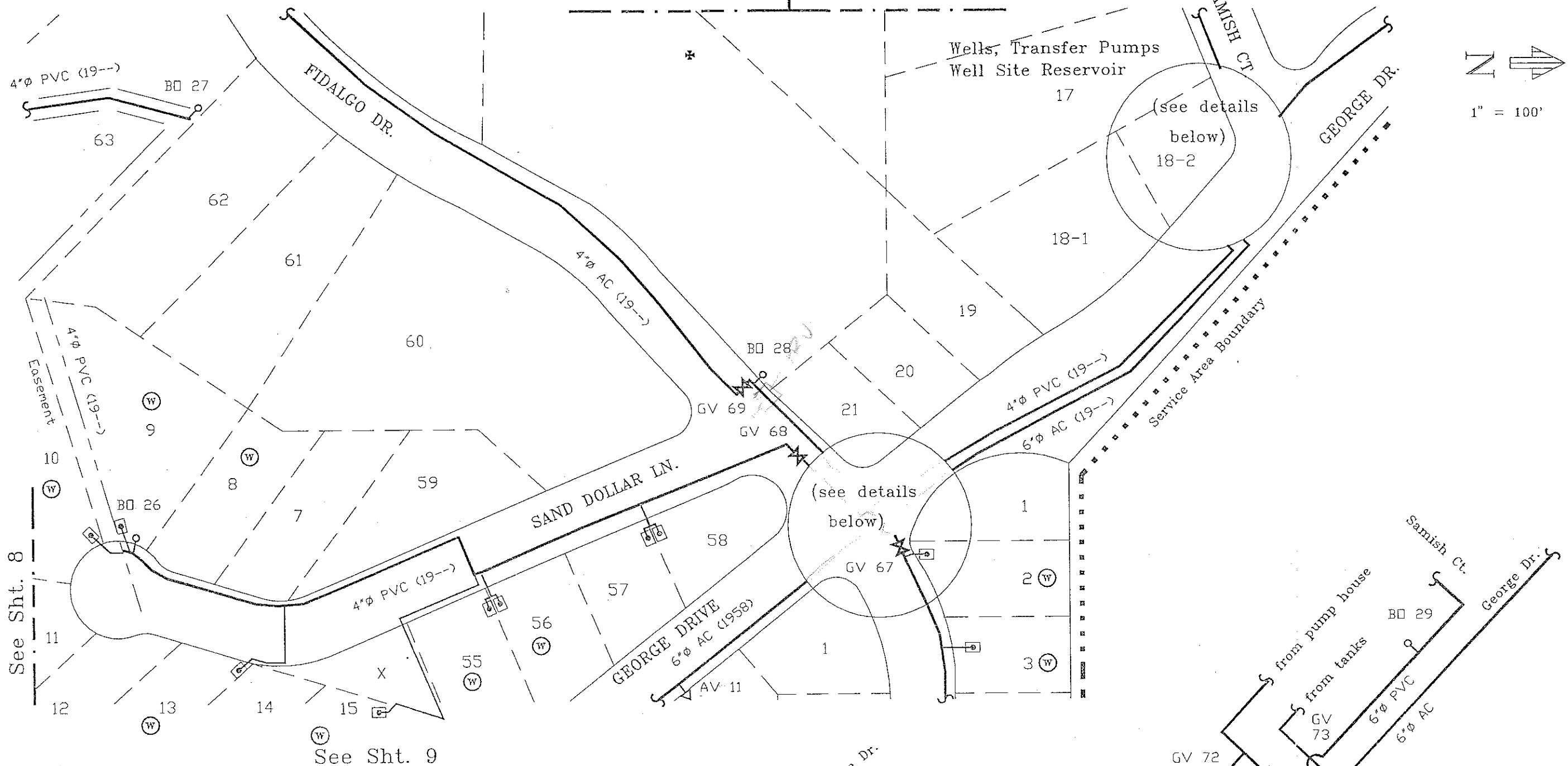
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WATER DISTRIBUTION SYSTEM
 COMPREHENSIVE MAP

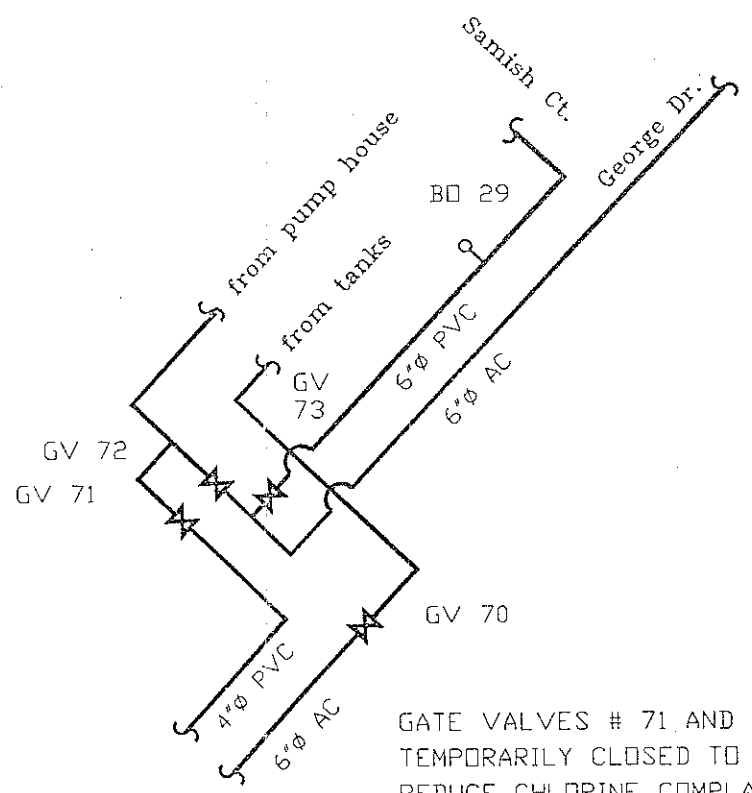
SCATCHET HEAD WATER DISTRICT
 3792 EAST HUBBLE COURT
 Clinton, Washington 98236

See Sht. 6

See Sht. 5



Fidalgo Dr. & George Dr.
Piping Diagram
n.t.s.



George Dr. Well Site
Piping Diagram
n.t.s.

GATE VALVES # 71 AND #73
TEMPORARILY CLOSED TO
REDUCE CHLORINE COMPLAINTS

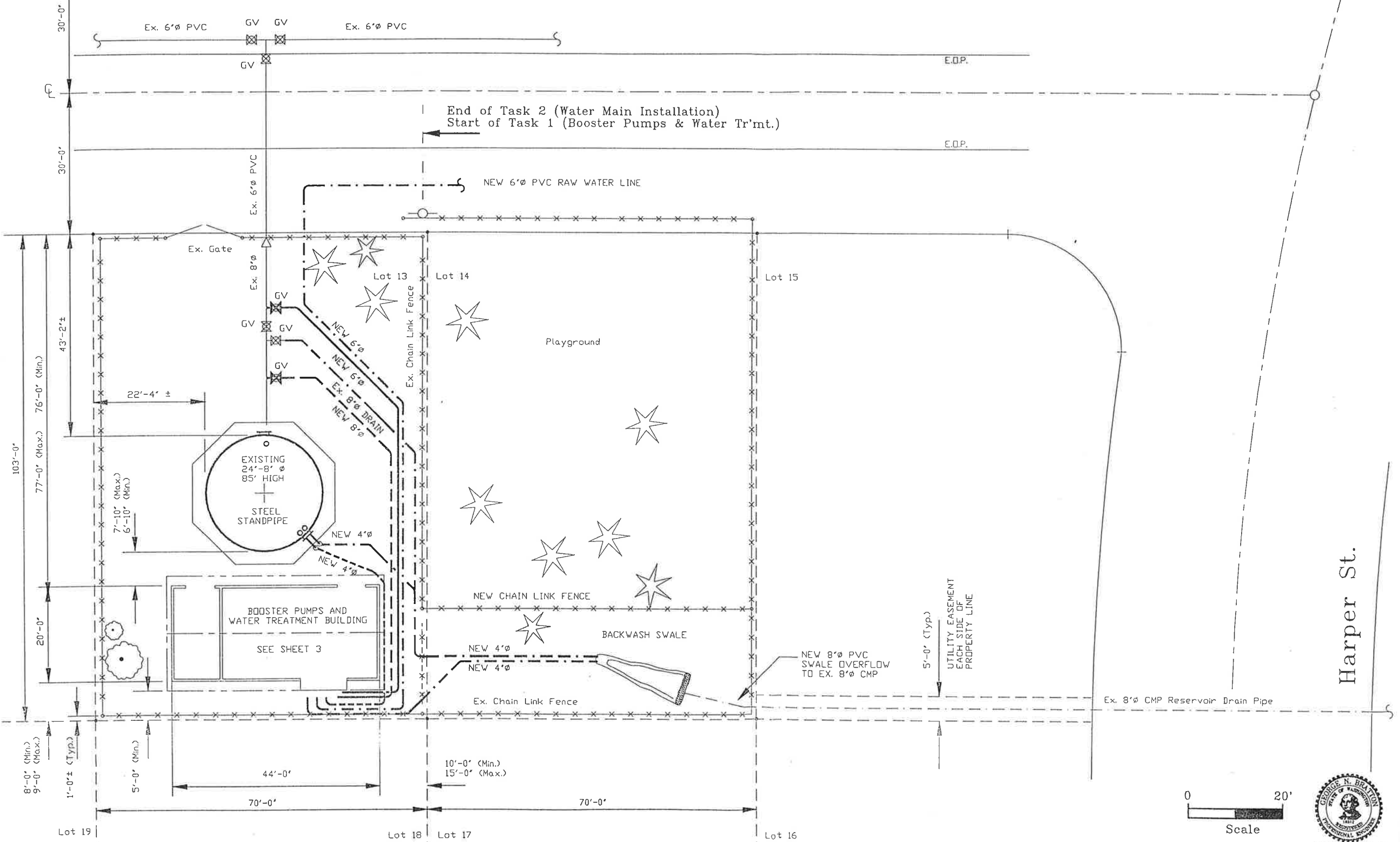
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Coupeville, Washington 98239
Job 297 November 1997

WATER DISTRIBUTION SYSTEM
COMPREHENSIVE MAP

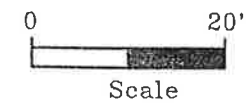
SCATCHET HEAD WATER DISTRICT
3792 EAST HUBBLE COURT
Clinton, Washington 98236



Guemes Ave.



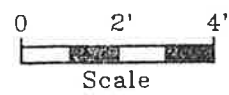
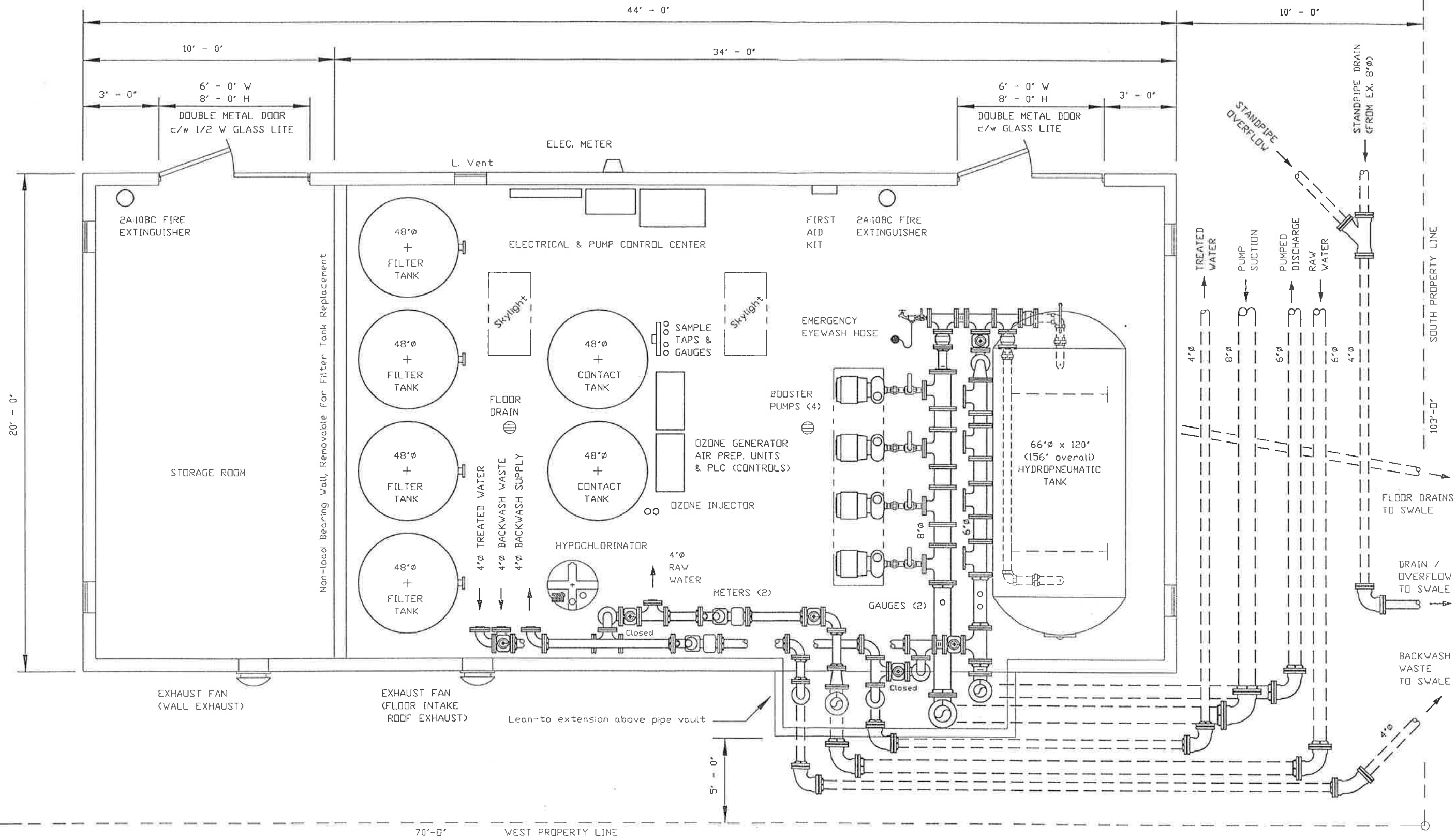
Harper St.



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 Job 297 September 1998

1999 WATER SYSTEM IMPROVEMENTS
 BOOSTER PUMPS & WATER TREATMENT
 Guemes Ave. Reservoir Site Plan

SCATCHET HEAD WATER DISTRICT
 3792 EAST HUBBLE COURT
 Clinton, Washington 98236



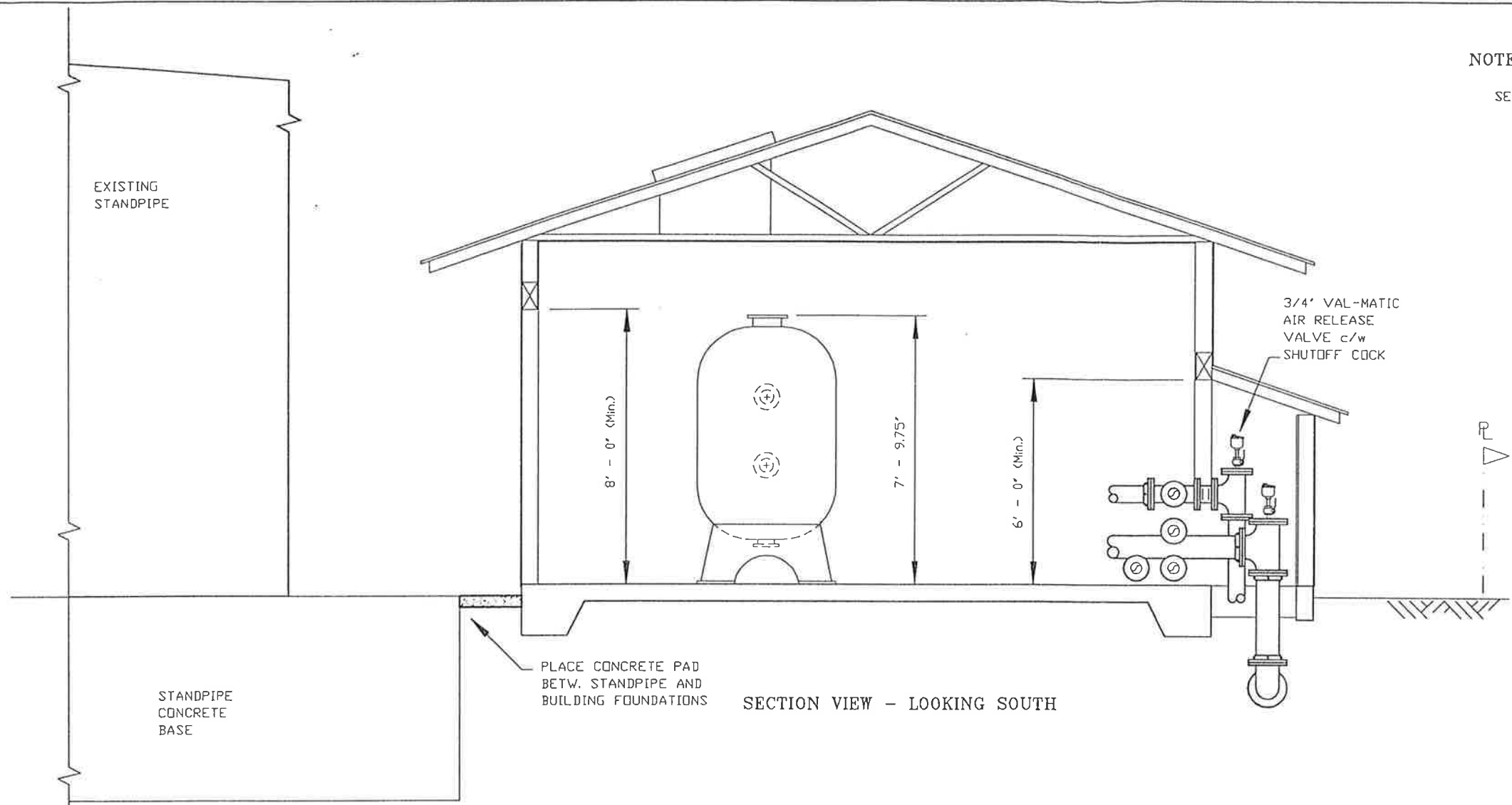
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1999 WATER SYSTEM IMPROVEMENTS
 BOOSTER PUMPS & WATER TREATMENT
 Building Layout

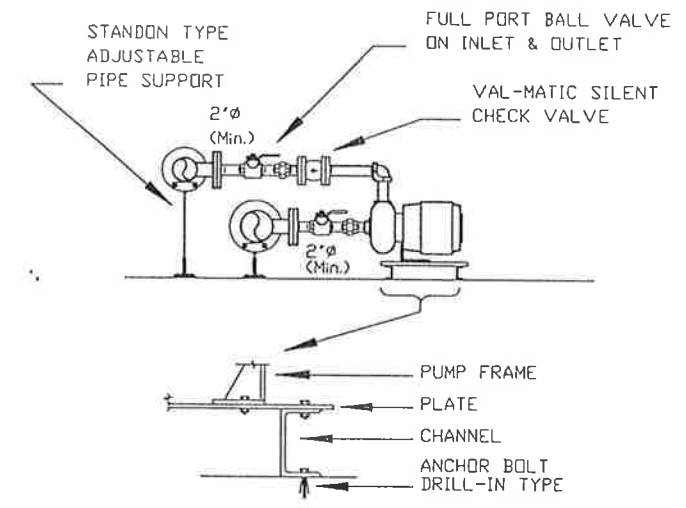
SCATCHETT HEAD WATER DISTRICT
 3792 EAST HUBBLE COURT
 Clinton, Washington 98236



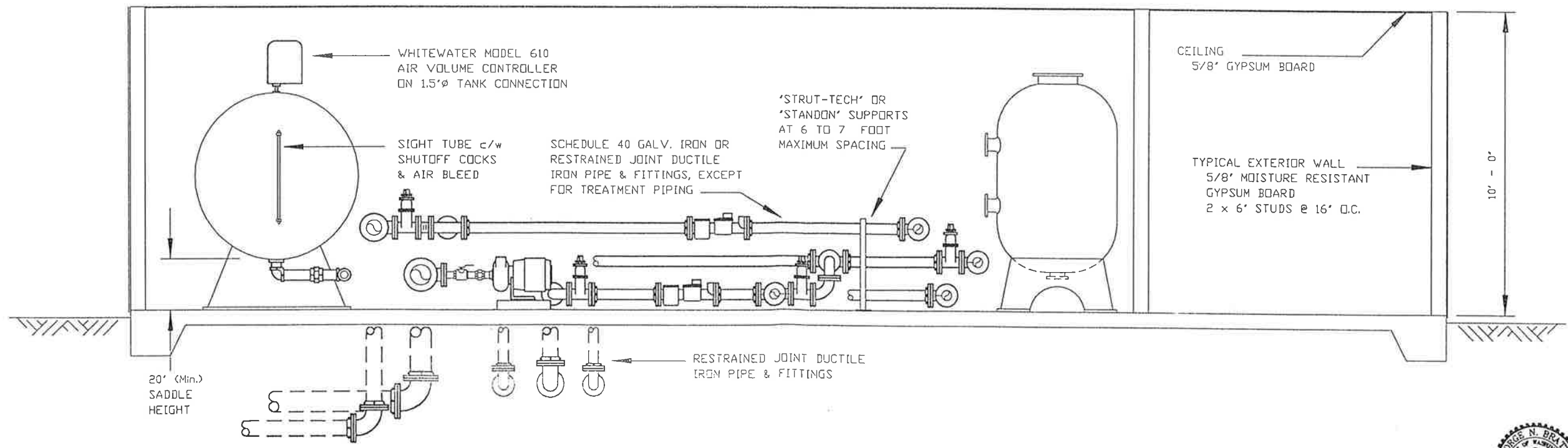
SECTION VIEW - LOOKING SOUTH

NOTES:

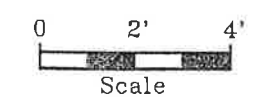
SEE ARCHITECT'S DRAWINGS FOR BUILDING CONSTRUCTION DETAILS.



PUMP SUPPORT DETAILS
n.t.s.



SECTION VIEW - LOOKING WEST

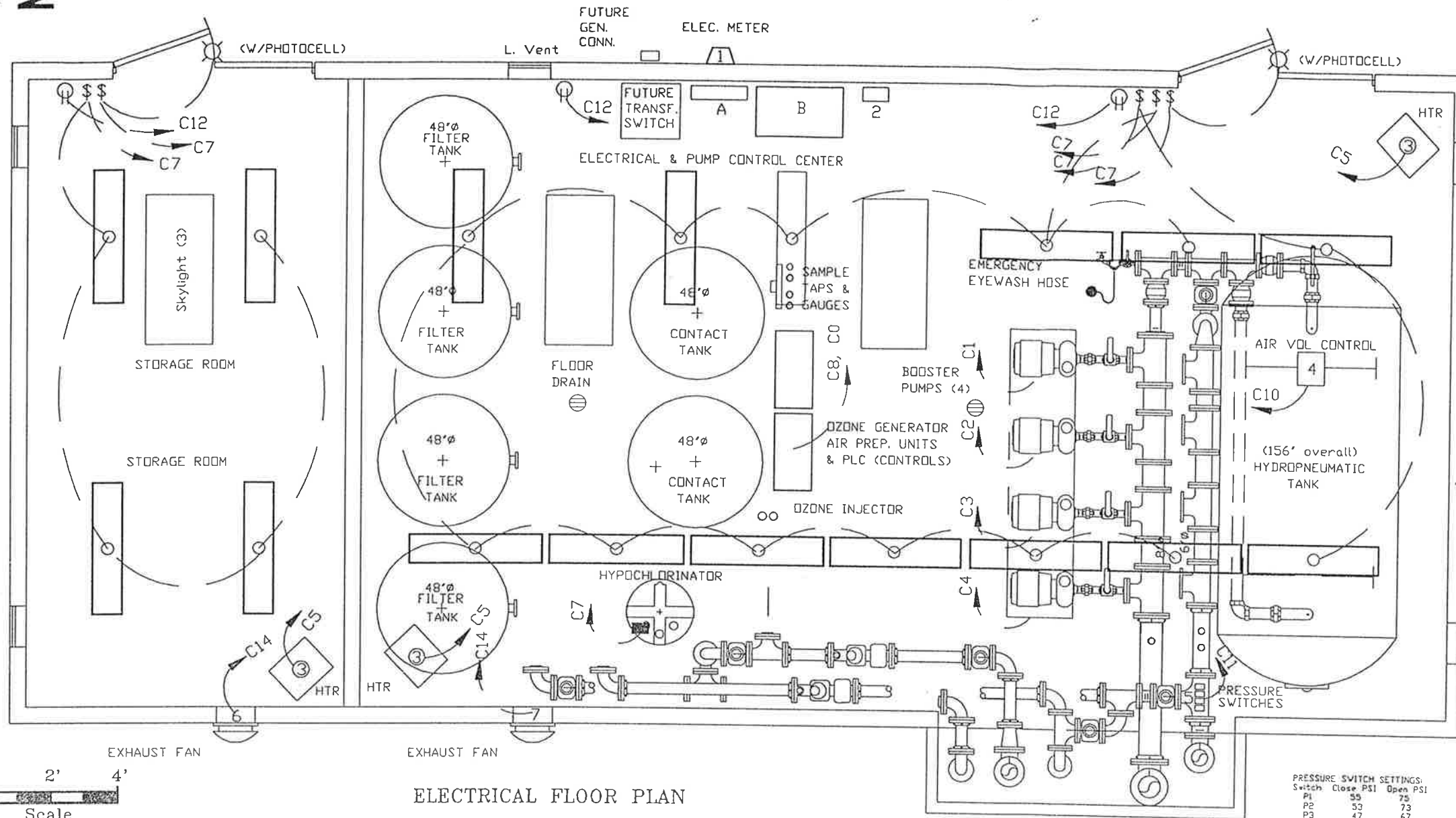


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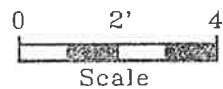
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Coupeville, Washington 98239
Job 297 September 1998

1999 WATER SYSTEM IMPROVEMENTS
BOOSTER PUMPS & WATER TREATMENT
Piping Elevations

SCATCHET HEAD WATER DISTRICT
3792 EAST HUBBLE COURT
Clinton, Washington 98236

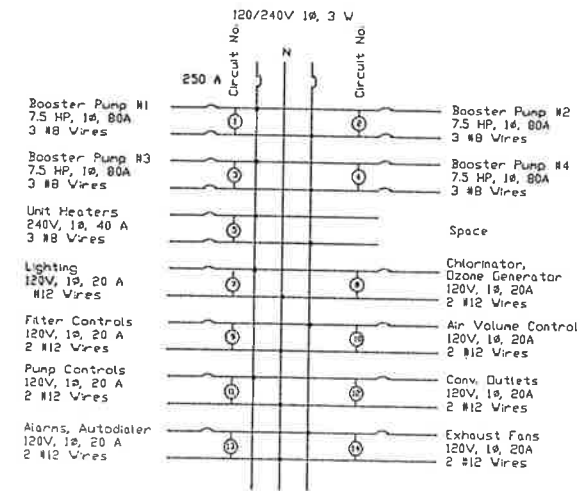


ELECTRICAL FLOOR PLAN

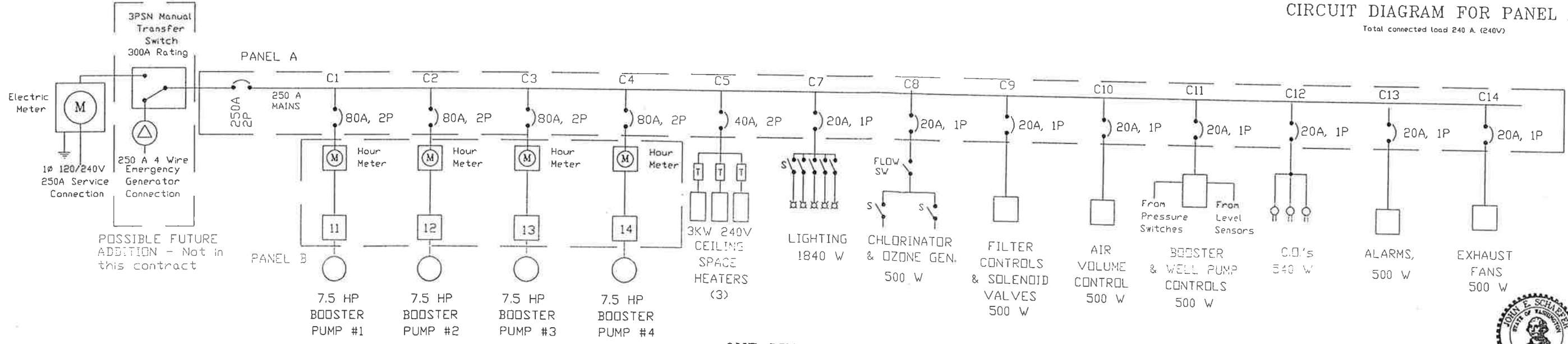


NOTES:

- Item Description
 - 1 Underground electric service and meter installation to be per Puget Sound Energy requirements.
 - A Distribution panel Square D type N000 per schedule
 - B Pump control panel per detail and specifications
 - 2 Autodiater - RACO 'Verbatim' Series VSS
 - 3 Unit heater - King Mod KB3-41, w/ integral thermostat.
 - 4 Whitewater Mod 610 air volume control
 - 5 Pressure switches - See Sheet 7
 - 6 Exhaust fan - Broan Mod 12C, through wall
 - 7 Exhaust fan - Broan Mod 502, w/duct through roof, galvanized steel roof jack and hood
- Interior lighting fixtures: Appleton VRS 240-120 NCSB, 2-lamp, fluorescent. Exterior fixtures to be Lithonia H-Tek TVL705-120-PE, 70-watt, hp sodium, wall mounted over doors.
- All control circuit conductors shall be color coded and identified by permanent labels at equipment connections and junction boxes.



CIRCUIT DIAGRAM FOR PANEL A
Total connected load 240 A. (240V)



ONE LINE DIAGRAM

1/21/99

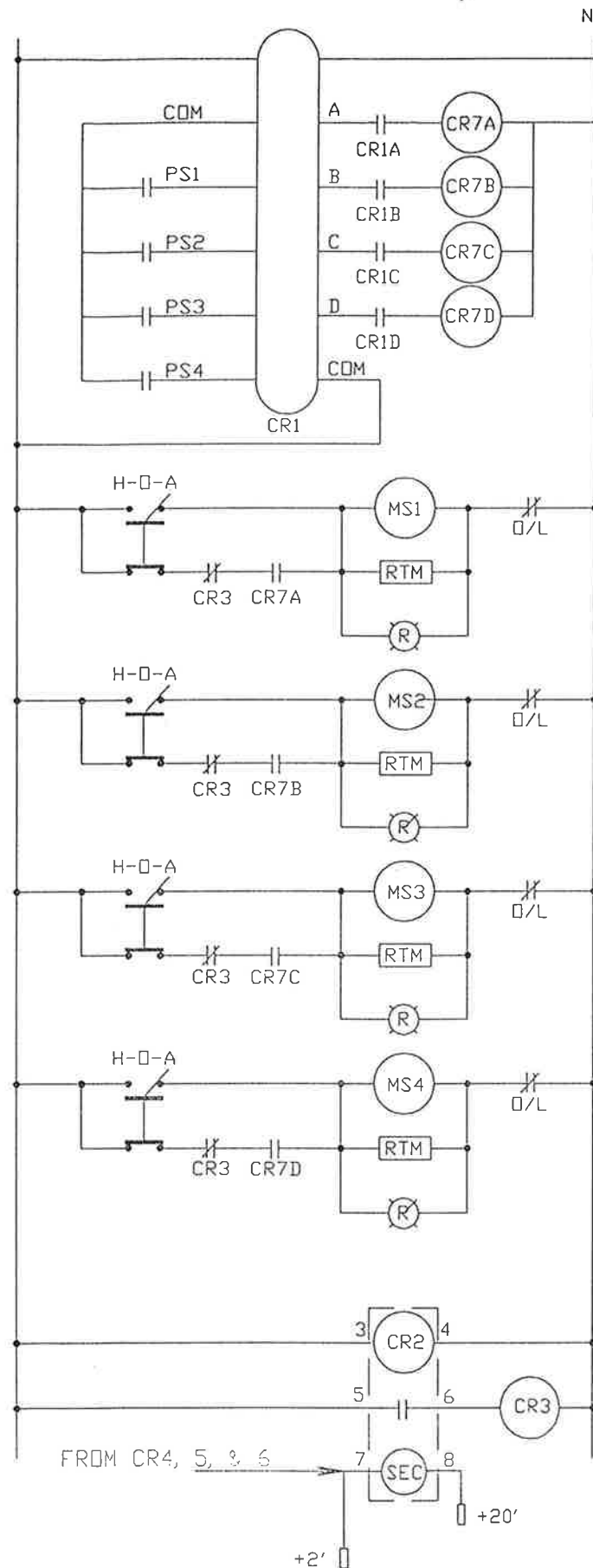


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P. O. Box 607
Coupeville, Washington 98239
Job 297 September 1998

1999 WATER SYSTEM IMPROVEMENTS
PUMP & TREATMENT BLDG. LAYOUT
Electrical Plan & Details

SCATCHET HEAD WATER DISTRICT
3792 EAST HUBBLE COURT
Clinton, Washington 98236

CIRCUIT C11 - 120 V.



CR1 - TIME MARK MOD 471
MULTI STAGE ALTERNATOR
PS 1-4 - SQ. D CL 9013 TYPE FSG-29,
SEE PLAN FOR SETTINGS
CR7A - CR7D ISOLATION RELAYS
SQUARE D 8501 KP12V20, W/SOCKETS

PUMP NO. 1 CONTROL
STARTERS SQUARE D CL 8536 SC03V02S(TYP)
SWITCHES & PILOT LTS (ALL PUMPS)
SQUARE D CLASS 9001, TYPE K
RTM - EAGLE SIGNAL TYPE HK410 (TYP)

PUMP NO. 2 CONTROL

PUMP NO. 3 CONTROL

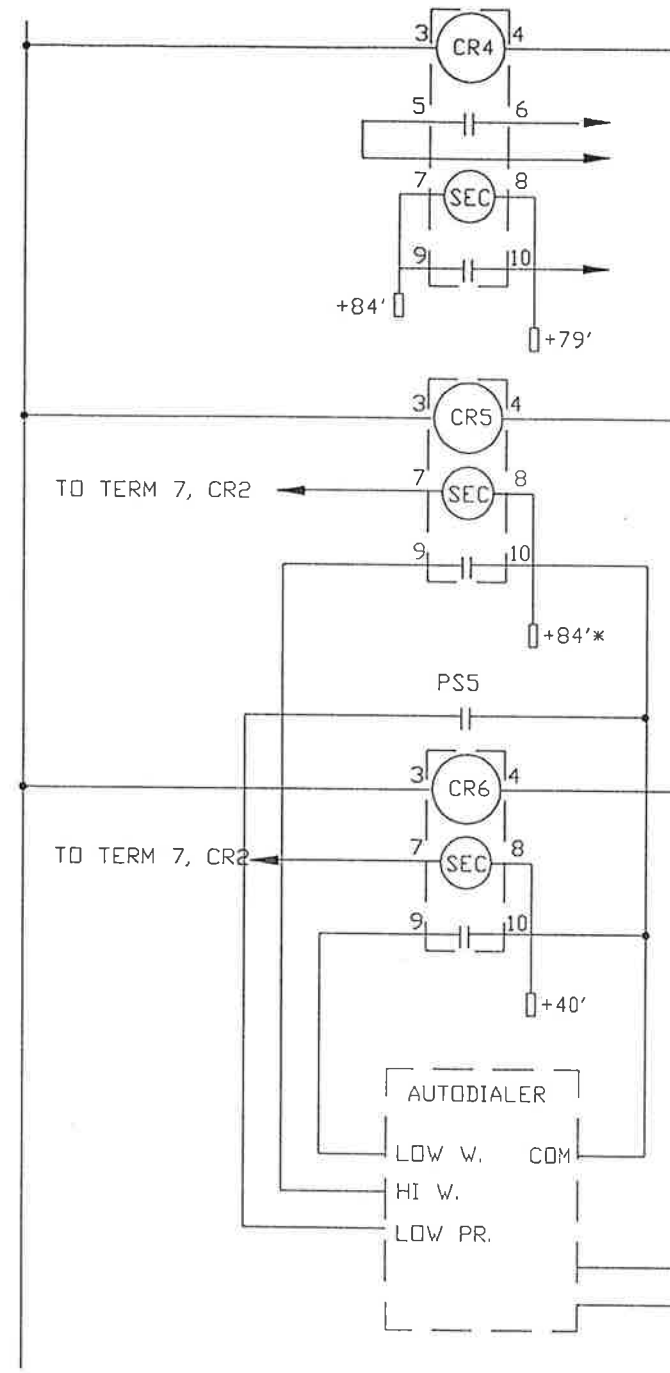
PUMP NO. 4 CONTROL

CR2 - B/W CONTROLS SERIES 1500-D RELAY
BOOSTER PUMP LOW WATER CUTOFF

CR3 - 4 POLE NC RELAY W/SOCKET
120V AC COIL, 5A RATED CONTACTS
SQUARE D CL 8501 TYPE RS14M1

ELECTRODE HEIGHTS ABOVE TANK BOTTOM

CIRCUIT C11 - CONTINUED FROM BELOW LEFT



CR4 - B/W CONTROLS SERIES 1500-D RELAY
WELL PUMP CONTROL

TO WELL PUMPS
VIA CONTROL CABLE

SECONDARY COIL TO BE SUITABLE FOR
3,500 FT #18 AWG LOOP CIRCUIT

TO TERM 7, CR2

ELECTRODE HEIGHTS ABOVE TANK BOTTOM

CR5 - B/W CONTROLS SERIES 1500-D RELAY
HIGH LEVEL ALARM

* ELECTRODE 6' BELOW OVERFLOW

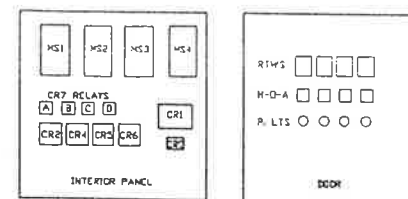
PSS - SQ. D CL 9013 TYPE FRG-59,
CLOSE @ 14 PSI (LOW PRESSURE ALARM)

CR6 - B/W CONTROLS SERIES 1500-D RELAY
LOW LEVEL ALARM

ELECTRODE HEIGHT ABOVE TANK BOTTOM

TELEPHONE
TO PANEL

ELECTRODES (TO BE INSTALLED IN EXISTING TANK):
B/W 6012-E553-7E FLG. CI ELECTRODE HOLDER
B/W 6013-W2 ELECTRODES W/WIRE & CONNECTORS
INSTALL 3" FLGD. NOZZLE IN TANK ROOF
INSTALL 3/4" RIGID GALV CONDUIT W 7 #14 THWN
COPPER CONDUCTORS TO CONTROL PANEL



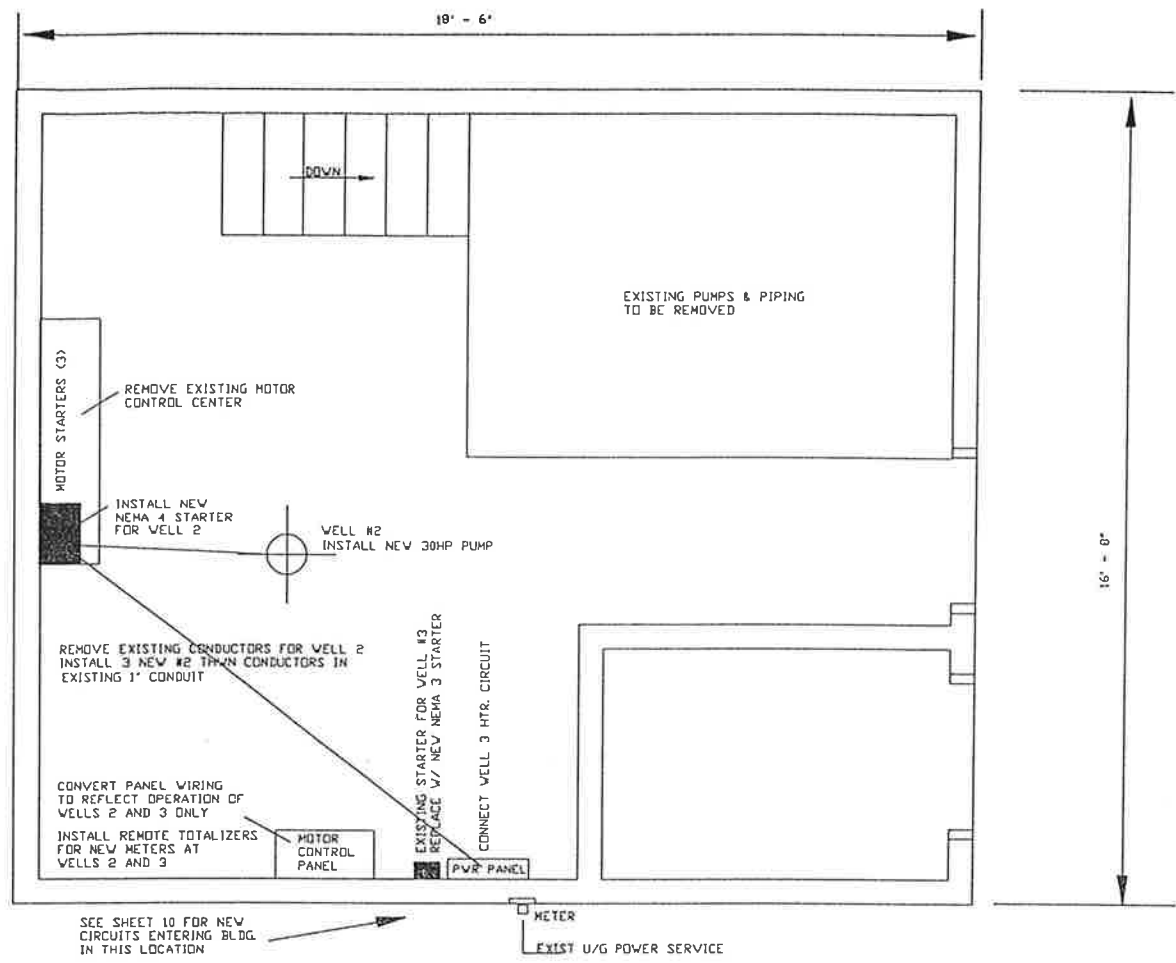
HEFFMAN ASSOCIATES ENCLOSURE
W/A-35P-20 PANEL
DETAIL - PUMP CONTROL PANEL



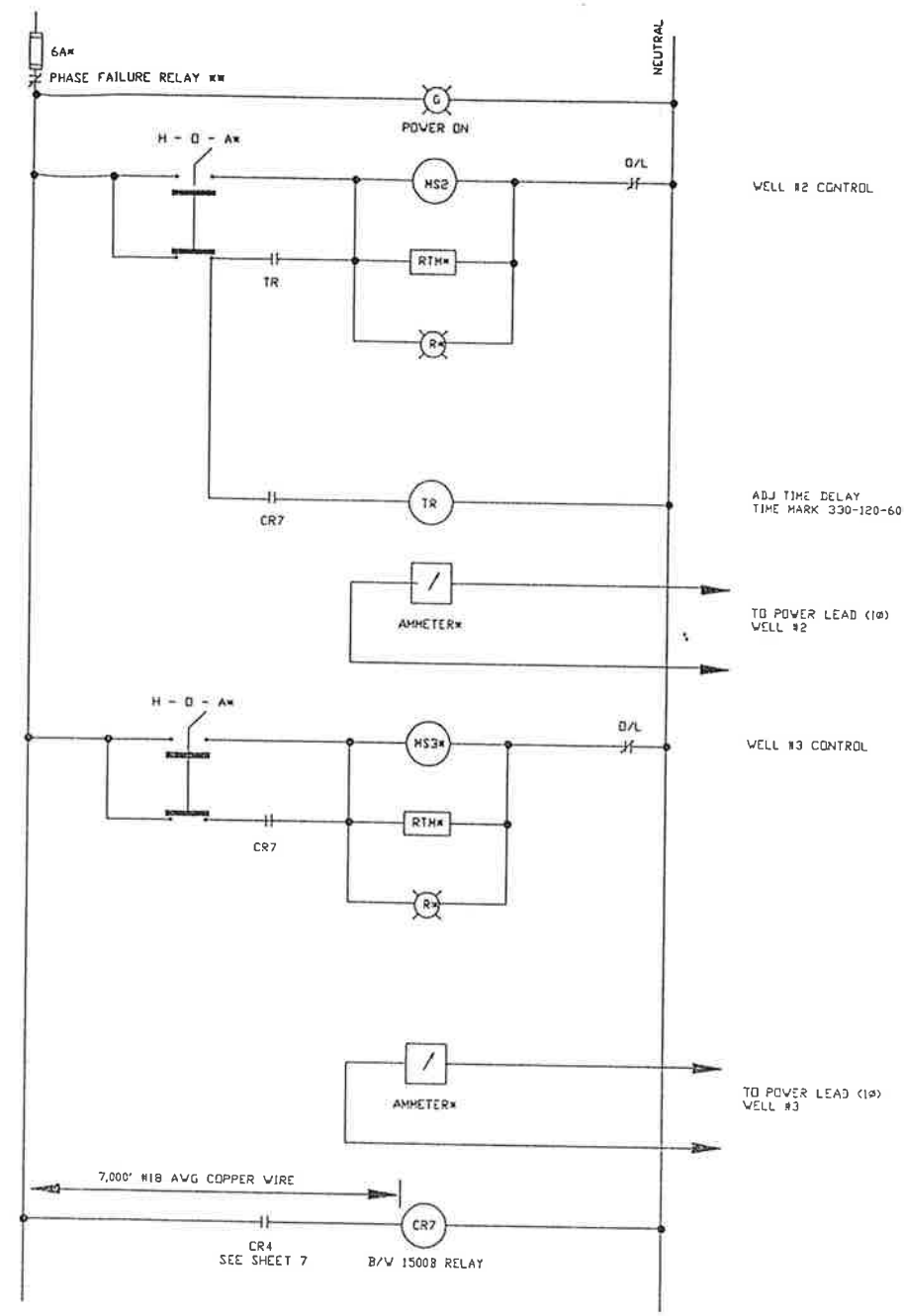
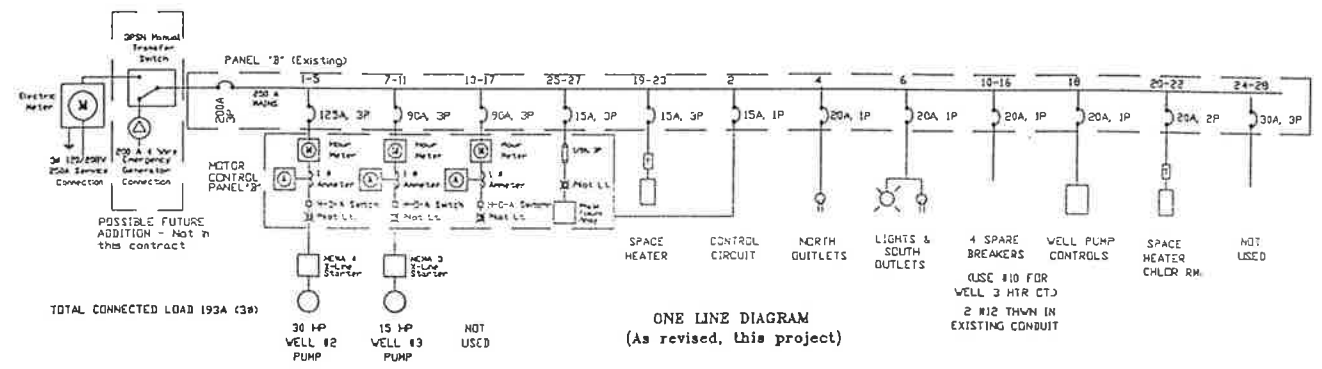
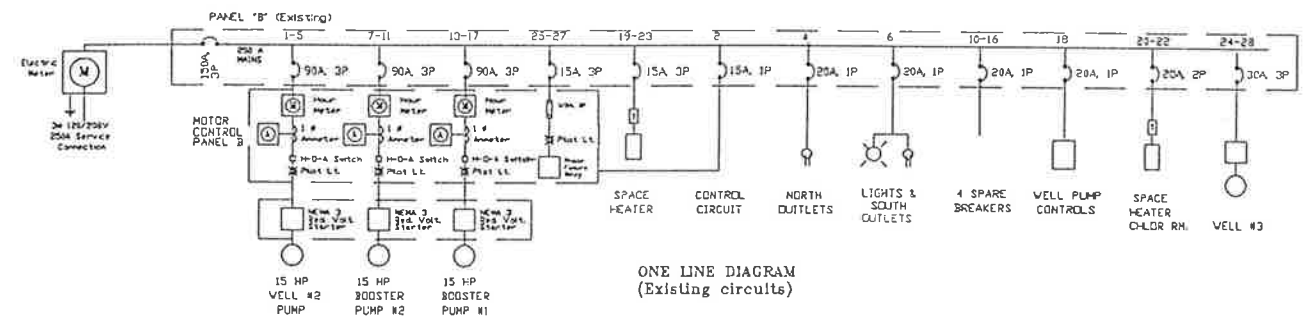
SCHAEFER & BRATTON, ENGINEERS
P. O. Box 607
Coupeville, Washington 98239
Job 297 September 1998

1999 WATER SYSTEM IMPROVEMENTS
PUMP & TREATMENT BLDG. LAYOUT
Well & Pump Control Circuit

SCATCHET HEAD WATER DISTRICT
3792 EAST HUBBLE COURT
Clinton, Washington 98236



FLOOR PLAN OF EXISTING PUMP & WELL HOUSE

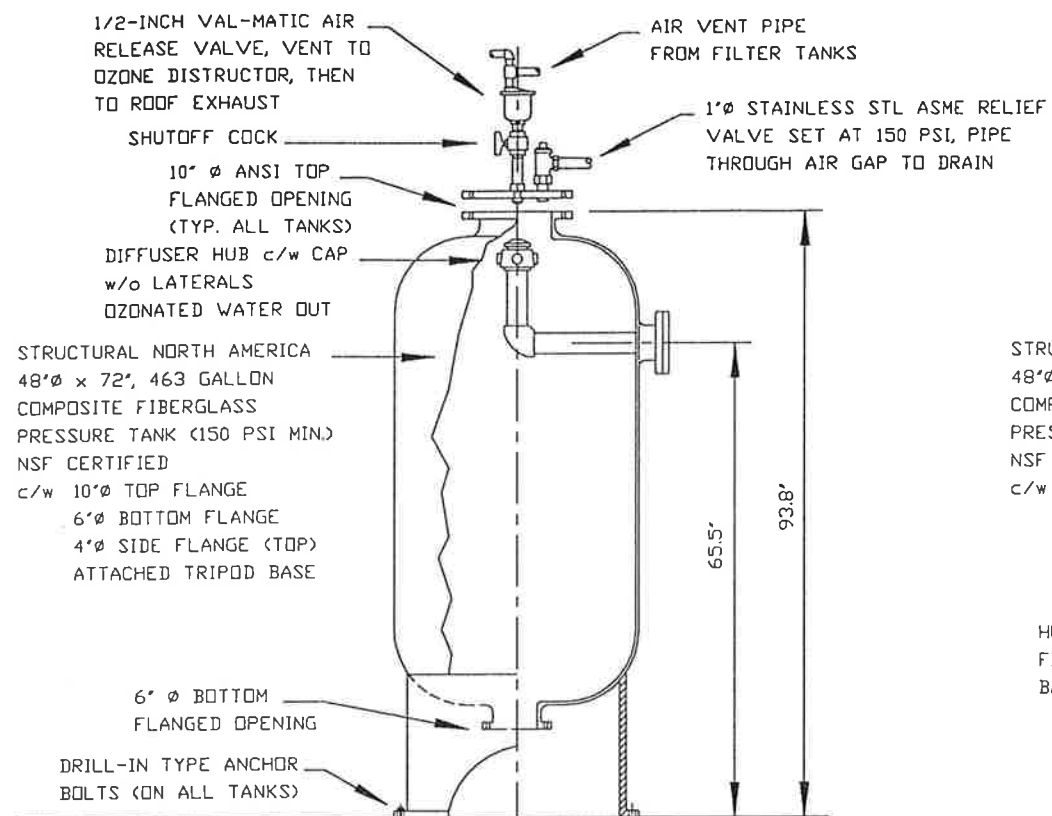


MODIFICATION OF EXISTING CONTROL CIRCUIT (#10)

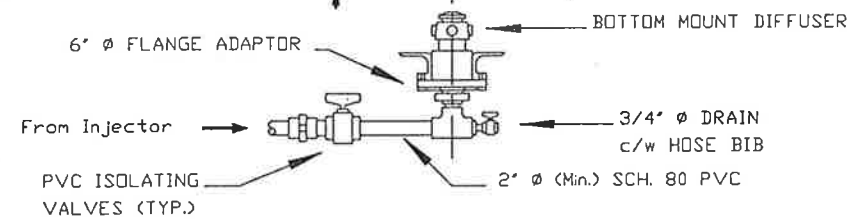
*EXISTING EQUIPMENT TO BE RE-CONNECTED AND USED IN NEW INSTALLATION

** REPLACE EXISTING PHASE FAILURE RELAY WITH NEW TIME-MARK HOD 2652 3-PHASE MONITOR.

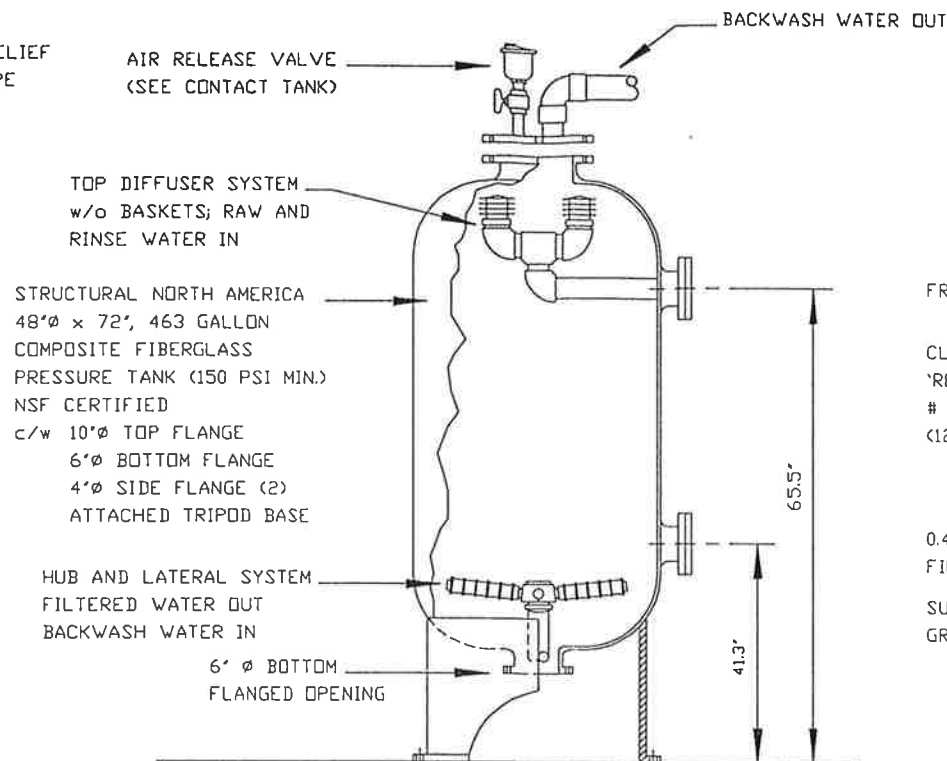
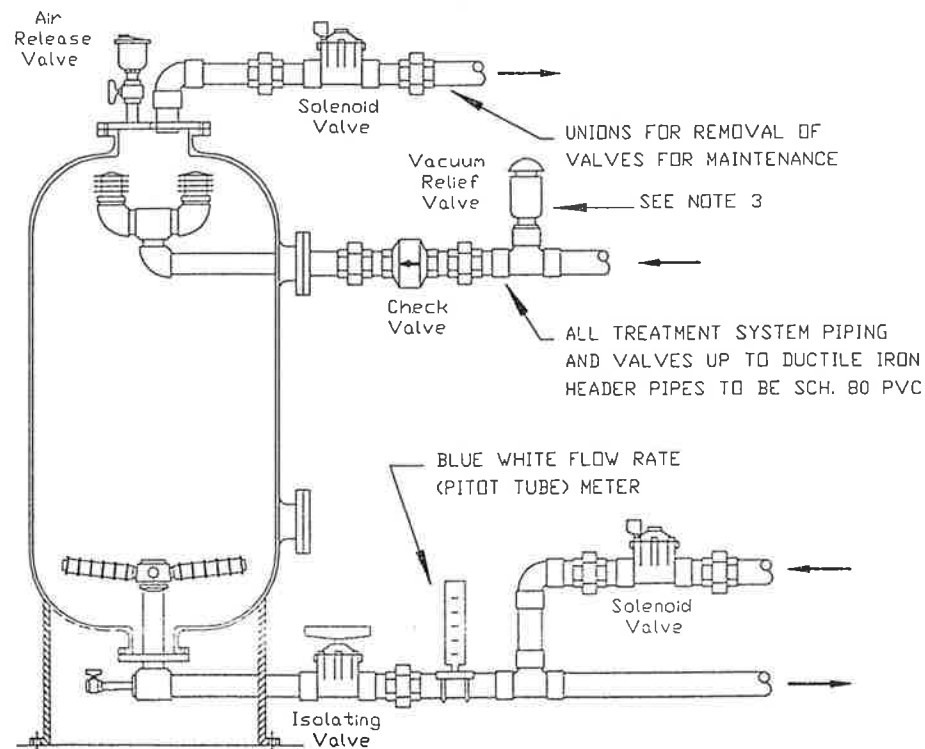




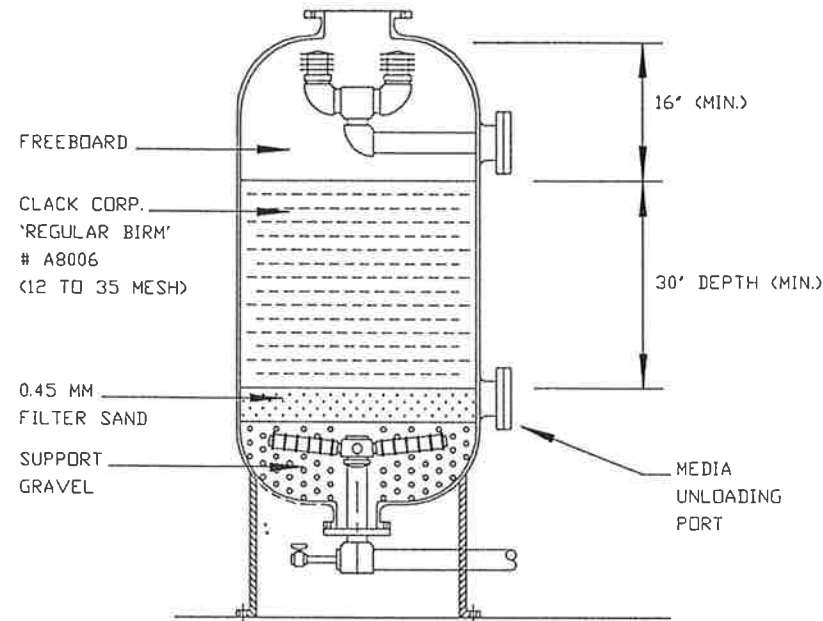
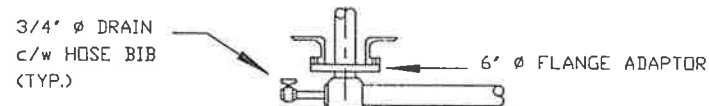
CONTACT TANKS (2)
N.T.S.



FILTER VALVES
N.T.S.



FILTER TANKS (4)
N.T.S.



ALL FILTER MEDIA AND SUPPORT MEDIA TO BE CERTIFIED AS MEETING NSF STANDARD 61

FILTER MEDIA
N.T.S.

CIRCUIT	FILTER	BACKWASH [individual filters]				RINSE all filters
		FILTER A	FILTER B	FILTER C	FILTER D	
SOLENOID # 1	OPEN	OPEN	CLOSED	CLOSED	CLOSED	CLOSED
SOLENOID # 2	OPEN	CLOSED	OPEN	CLOSED	CLOSED	CLOSED
SOLENOID # 3	OPEN	CLOSED	CLOSED	OPEN	CLOSED	CLOSED
SOLENOID # 4	OPEN	CLOSED	CLOSED	CLOSED	OPEN	CLOSED
SOLENOID # 5	OPEN	OPEN	CLOSED	CLOSED	CLOSED	CLOSED
SOLENOID # 6	OPEN	CLOSED	OPEN	CLOSED	CLOSED	CLOSED
SOLENOID # 7	OPEN	CLOSED	CLOSED	OPEN	CLOSED	CLOSED
SOLENOID # 8	OPEN	CLOSED	CLOSED	CLOSED	OPEN	CLOSED
SOLENOID # 9	OPEN	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
SOLENOID # 10	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	OPEN
WELL PUMPS	OPEN	CLOSED	CLOSED	CLOSED	CLOSED	OPEN
HYPOCHLORINATOR	OPEN	CLOSED	CLOSED	CLOSED	CLOSED	OPEN
OZONE GENERATOR	OPEN	CLOSED	CLOSED	CLOSED	CLOSED	OPEN
AIR PREP. UNITS	OPEN	CLOSED	CLOSED	CLOSED	CLOSED	OPEN

PROGRAMMABLE LOGIC CONTROLLER (PLC)

NOTES:

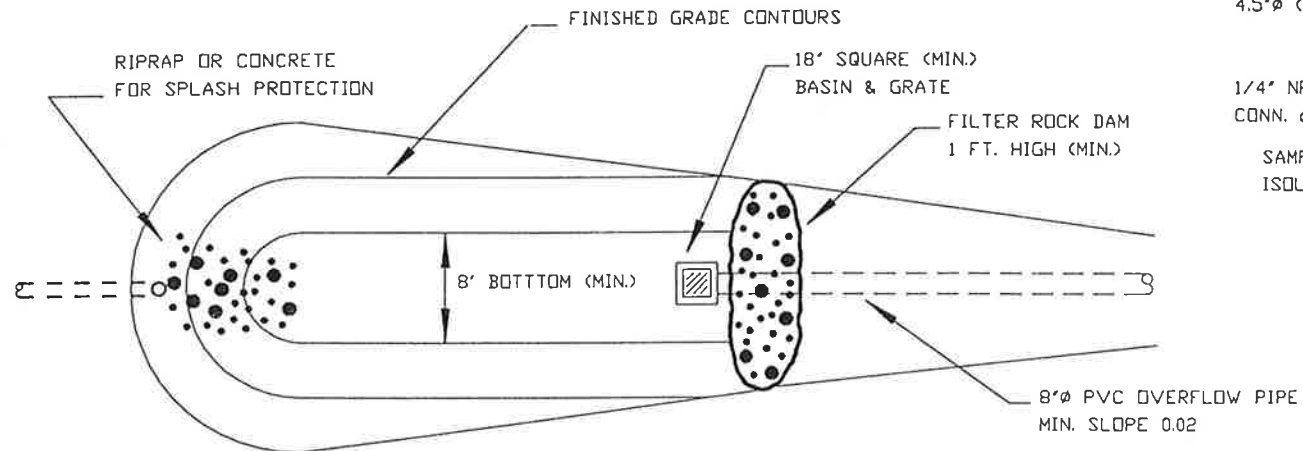
- 1) SEE DWG. 4 FOR VALVE NUMBERING.
- 2) FILTER TANKS MAY USE BOTTOM FLANGE FOR MEDIA UNLOADING, AND BOTTOM SIDE FLANGE FOR HUB AND LATERAL CONNECTION.
- 3) VACUUM RELIEF VALVE IS TO PROTECT INNER SHELL OF TANKS FROM COLLAPSING UNDER VACUUM.
- 4) PITOT TUBE FLOW METER ON EACH FILTER TANK TO BE USED TO MONITOR THE DISTRIBUTION OF PRODUCT FLOW BETWEEN FILTERS TANKS.



MIN. SWALE CAPACITY FOR ONE 48" Ø FILTER TANK

Depth (ft)	Sec. Area (sq.ft.)	Vet Perim. (ft)	Hyd. radius (ft)	Velocity (fps)	Discharge (cfs) / gpm	Backwash - 1 Filter Volume for 15 Minute at 150 gpm
						cu.ft. gallons
0.10	0.43	4.63	0.09	1.02	0.44 197	300 2,250

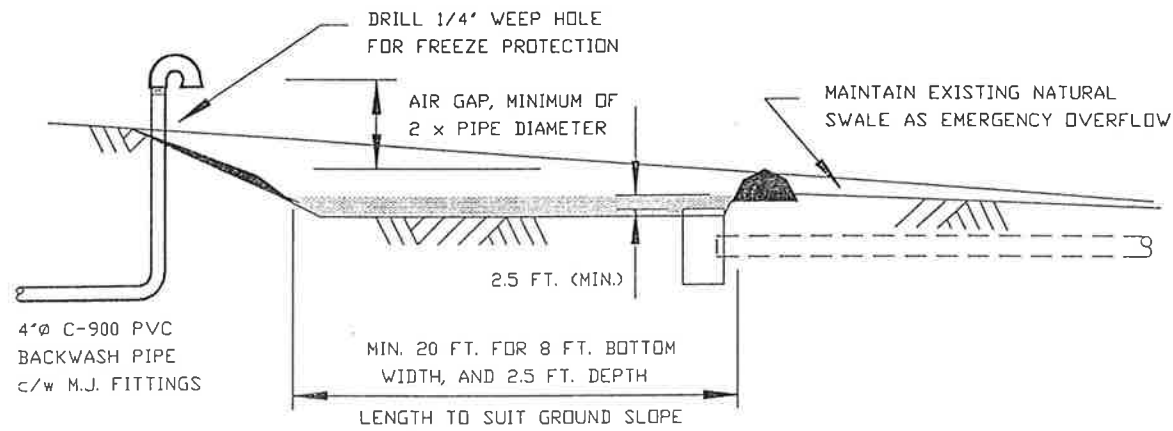
ALLOW VOLUME FOR TWO 48" Ø FILTER TANKS (600 CU. FT.) TO BACKWASH EACH DAY E.G., FOR 8 FT. BOTTOM, PROVIDE DEPTH OVER TOP OF GRATE OF 2.5 FT. (MIN.)



Plan

SWALE DETAILS:

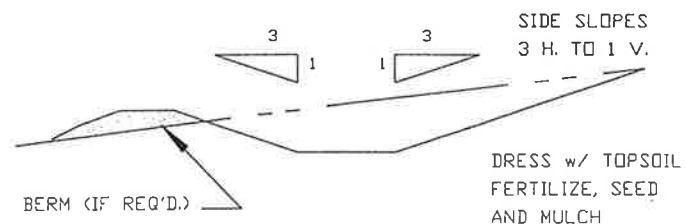
Grass lined trap channel (n = 0.030)
 Bottom width: 4 ft. (min.)
 Side & head slopes: 1 vert. to 3 horiz.
 Longitudinal slope: 0.010



Longitudinal Profile

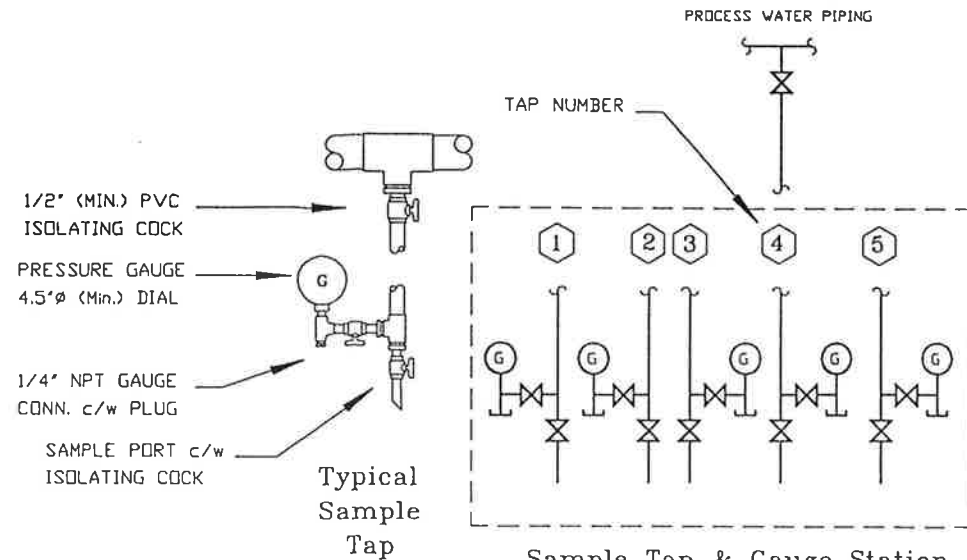
NOTES:

- DISPOSAL AREA TO BE PERIODICALLY CLEANED. BOTTOM SHOULD NOT BE ALLOWED TO CAKE WITH FILTRATE PRECLUDING VEGETATION GROWTH AND/OR INFILTRATION
- BACKWASH DISCHARGE PIPE MAY NEED TO BE PERIODICALLY CLEANED BY 'PIGGING'
- RETURN BEND AT END OF DISCHARGE PIPE TO BE CONNECTED BY SCREWED FITTING. FLARE FITTINGS OR OTHER FITTINGS MAY BE USED TO DISSIPATE ENERGY, PROVIDED ADEQUATE AIR GAP IS MAINTAINED



Typical Section

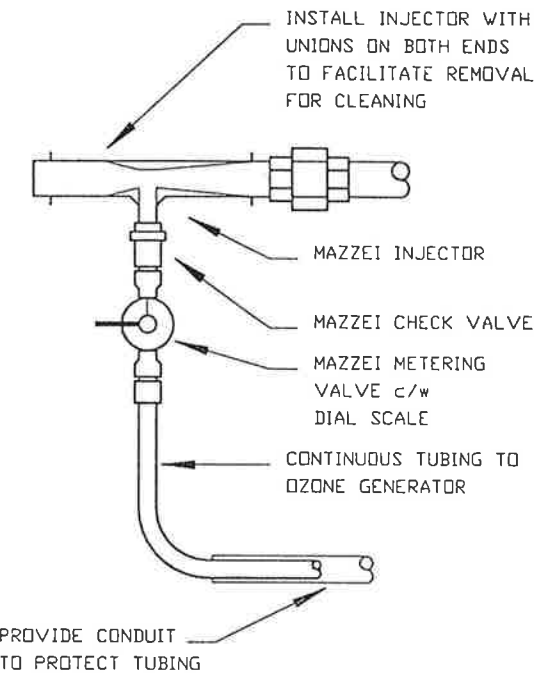
SWALE FOR BACKWASH DISPOSAL
N.T.S.



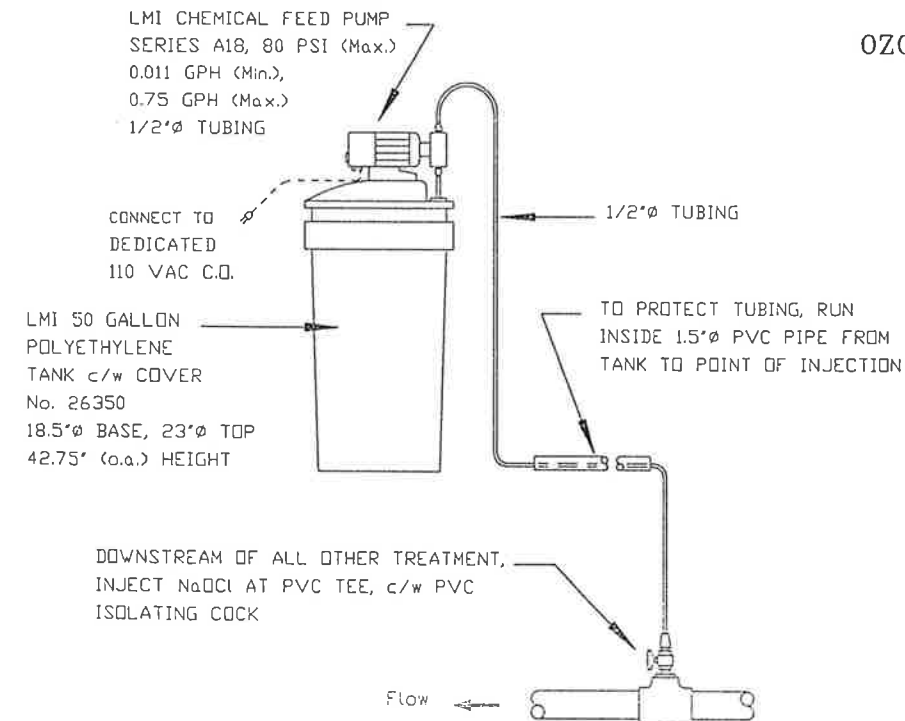
Typical Sample Tap

Sample Tap & Gauge Station
COMMON SAMPLE SITE, ATTACH TO PLYWOOD SHEET FOR MOUNTING ON POST NEXT TO TANKS

SAMPLE TAPS
N.T.S.



OZONE INJECTOR
N.T.S.



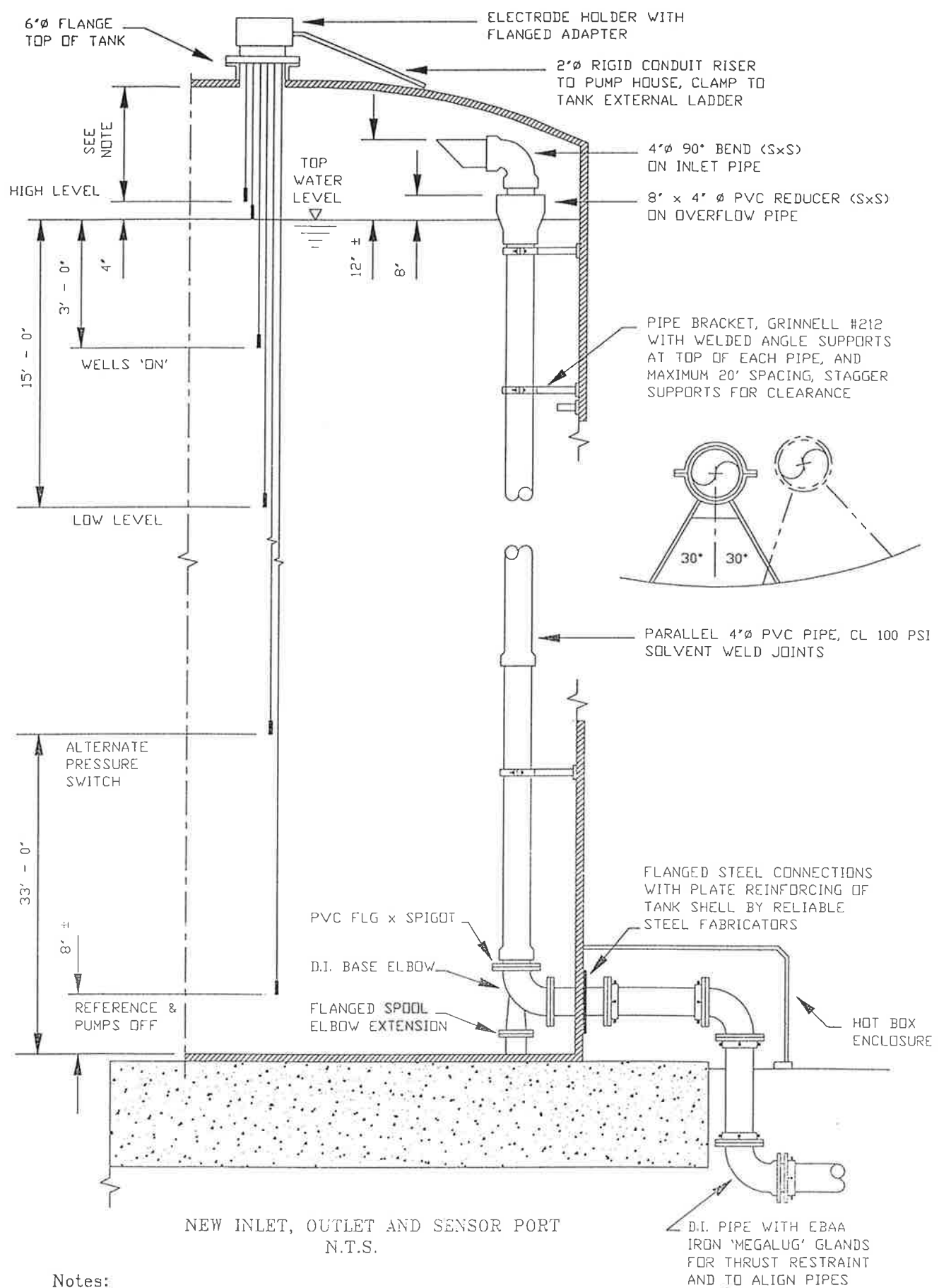
HYPOCHLORINATOR
N.T.S.

SCHAEFFER & BRATTON, ENGINEERS
 P. O. Box 607
 Coupeville, Washington 98239
 Job 297 December 1998

1999 WATER SYSTEM IMPROVEMENTS
 WATER TREATMENT EQUIPMENT

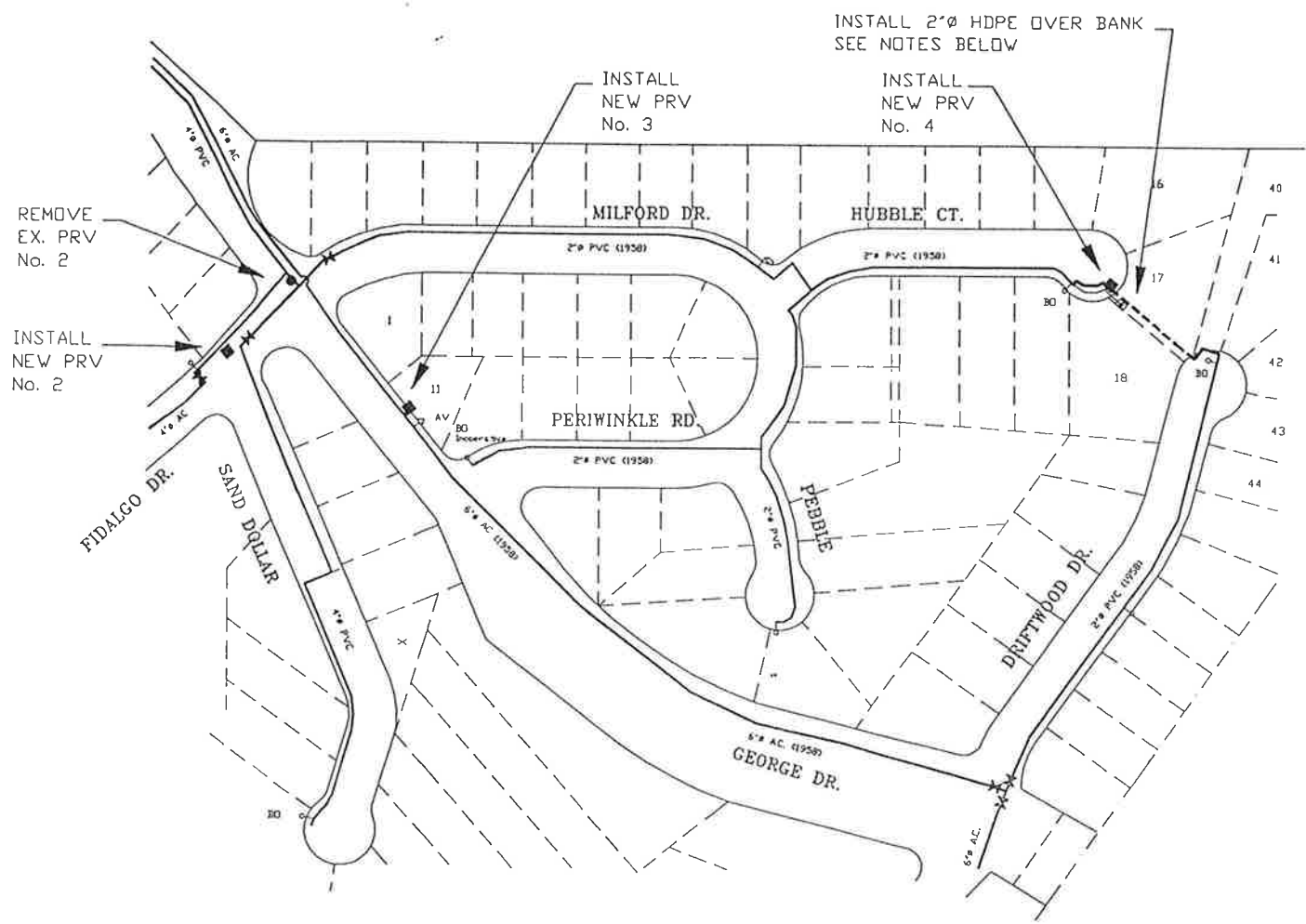
SCATCHET HEAD WATER DISTRICT
 3792 EAST HUBBLE COURT
 Clinton, Washington 98236



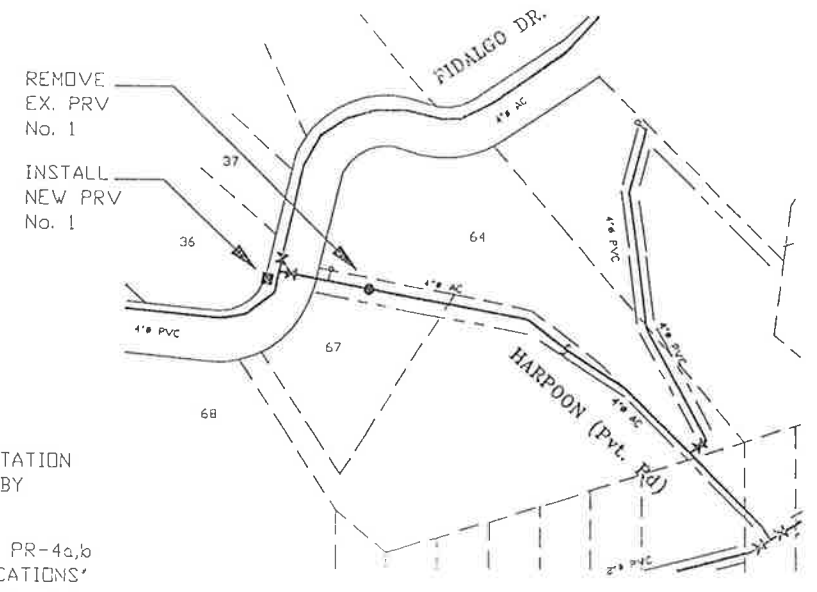


NEW INLET, OUTLET AND SENSOR PORT
N.T.S.

- Notes:
- 1) ESTABLISHMENT OF TOP WATER LEVEL REFERENCE TO BE DONE ON SITE WITH DIRECTION FROM SYSTEM OPERATOR



PRV STATION Nos. 2, 3 & 4
N.T.S.



PRV STATION No. 1
N.T.S.

- Notes:
- 1) LOCATION OF NEW PRV STATION TO BE MARKED IN FIELD BY SYSTEM OPERATOR
 - 2) SEE DETAILS PR-2a,b,c & PR-4a,b WITH 'STANDARD SPECIFICATIONS' FOR PRV STATION CONSTRUCTION
 - 3) SEE DETAILS PE-1, 2 & 3 WITH 'STANDARD SPECIFICATIONS' FOR HDPE PIPE INSTALLATION



SCHAEFER & BRATTON, ENGINEERS
P. O. Box 607
Coupeville, Washington 98239
Job 297 February, 1999

1999 WATER SYSTEM IMPROVEMENTS
BOOSTER PUMPS & WATER TREATMENT
Standpipe Modifications
PRV Station Locations

SCATCHET HEAD WATER DISTRICT
3792 EAST HUBBLE COURT
Clinton, Washington 98236

APPENDIX C Service Area Maps

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Scatchet Head Water District



5/7/2019, 3:43:39 PM

Plats

Plat Existing Service Area

Parcels

Quarter Sections

One Way Directions

Road Closures

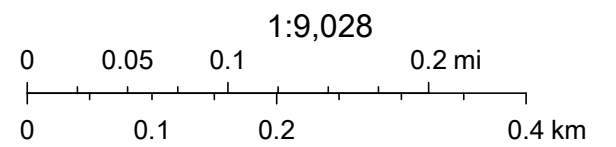
Roads

Highway

Collector and Arterial

Local

Private



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Island County



ICGeoMap



Legend

- Parcels
- Roads**
 - Highway
 - Collector and Arterial
 - Local
 - Private
- Watersystems**
 - Unknown
 - Class A
 - Class B

1:23,517



WGS_1984_Web_Mercator_Auxiliary_Sphere
© Latitude Geographics Group Ltd.

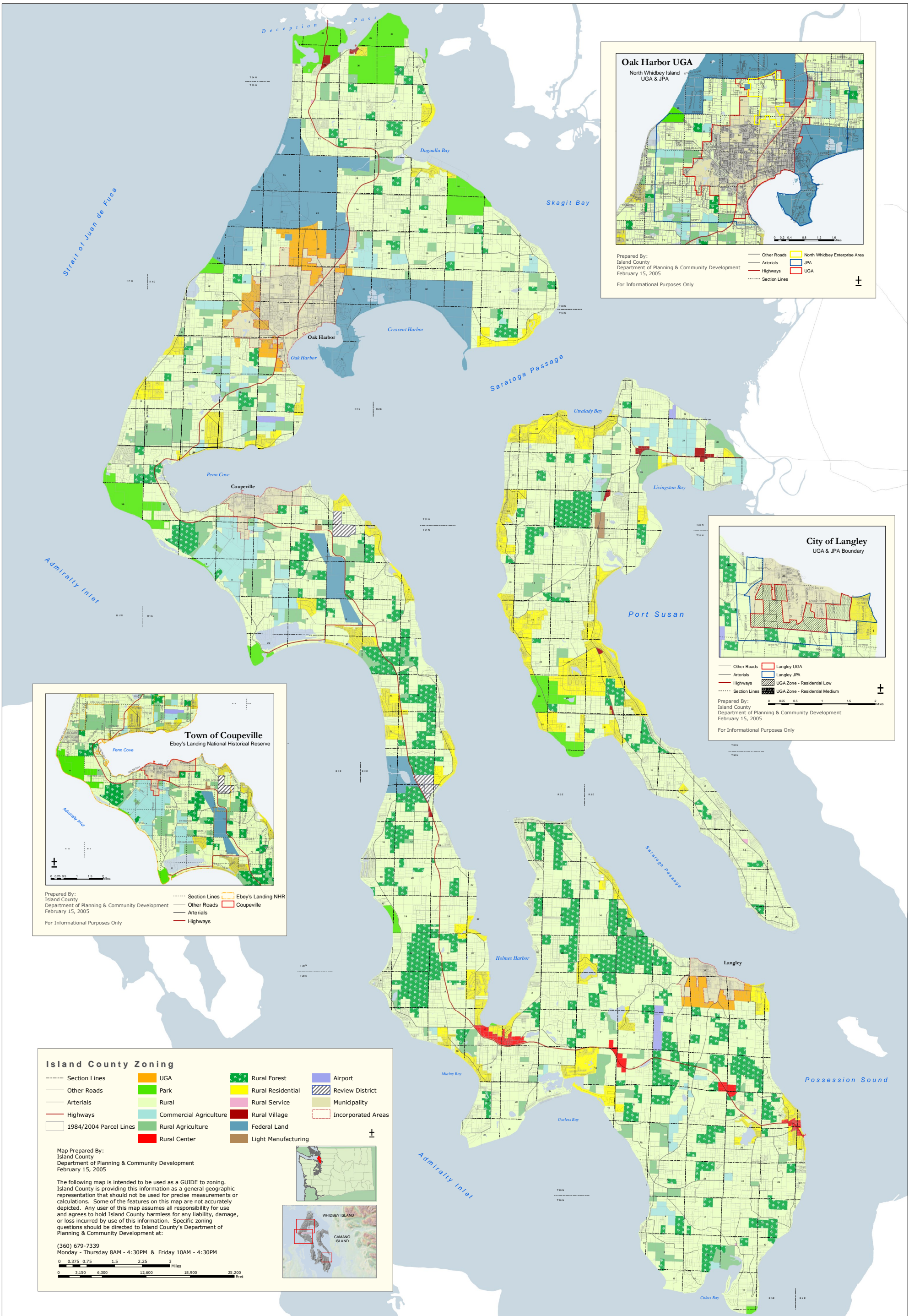
This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
DO NOT USE AS A LEGAL DOCUMENT. ACCURACY IS NOT GUARANTEED.

Notes

Scatchet Head Water District Boundary

APPENDIX D County Zoning and Land Use Maps

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Oak Harbor UGA

North Whidbey Island UGA & JPA

Prepared By:
Island County
Department of Planning & Community Development
February 15, 2005

For Informational Purposes Only

- Other Roads
- Arterials
- Highways
- Section Lines
- North Whidbey Enterprise Area
- JPA
- UGA

City of Langley

UGA & JPA Boundary

Prepared By:
Island County
Department of Planning & Community Development
February 15, 2005

For Informational Purposes Only

- Other Roads
- Arterials
- Highways
- Section Lines
- Langley UGA
- Langley JPA
- UGA Zone - Residential Low
- UGA Zone - Residential Medium

Town of Coupeville

Ebey's Landing National Historical Reserve

Prepared By:
Island County
Department of Planning & Community Development
February 15, 2005

For Informational Purposes Only

- Section Lines
- Other Roads
- Arterials
- Highways
- Ebey's Landing NHR
- Coupeville

Island County Zoning

Section Lines	UGA	Rural Forest	Airport
Other Roads	Park	Rural Residential	Review District
Arterials	Rural	Rural Service	Municipality
Highways	Commercial Agriculture	Rural Village	Incorporated Areas
1984/2004 Parcel Lines	Rural Agriculture	Federal Land	
	Rural Center	Light Manufacturing	

Map Prepared By:
Island County
Department of Planning & Community Development
February 15, 2005

The following map is intended to be used as a GUIDE to zoning. Island County is providing this information as a general geographic representation that should not be used for precise measurements or calculations. Some of the features on this map are not accurately depicted. Any user of this map assumes all responsibility for use and agrees to hold Island County harmless for any liability, damage, or loss incurred by use of this information. Specific zoning questions should be directed to Island County's Department of Planning & Community Development at:

(360) 679-7339
Monday - Thursday 8AM - 4:30PM & Friday 10AM - 4:30PM

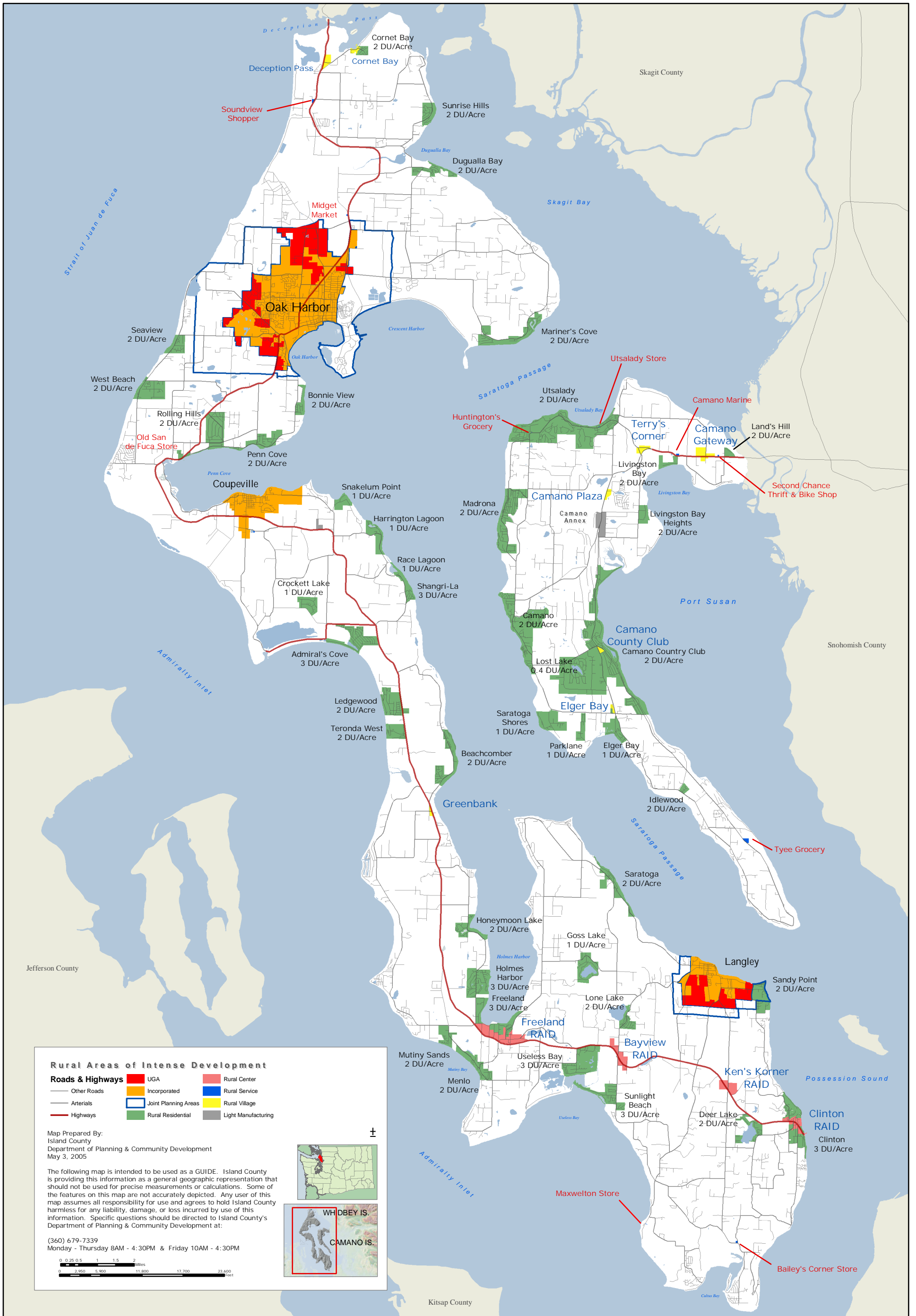
0 0.375 0.75 1.5 2.25 3 Miles
0 3,150 6,300 12,600 18,900 25,200 Feet

ISLAND COUNTY

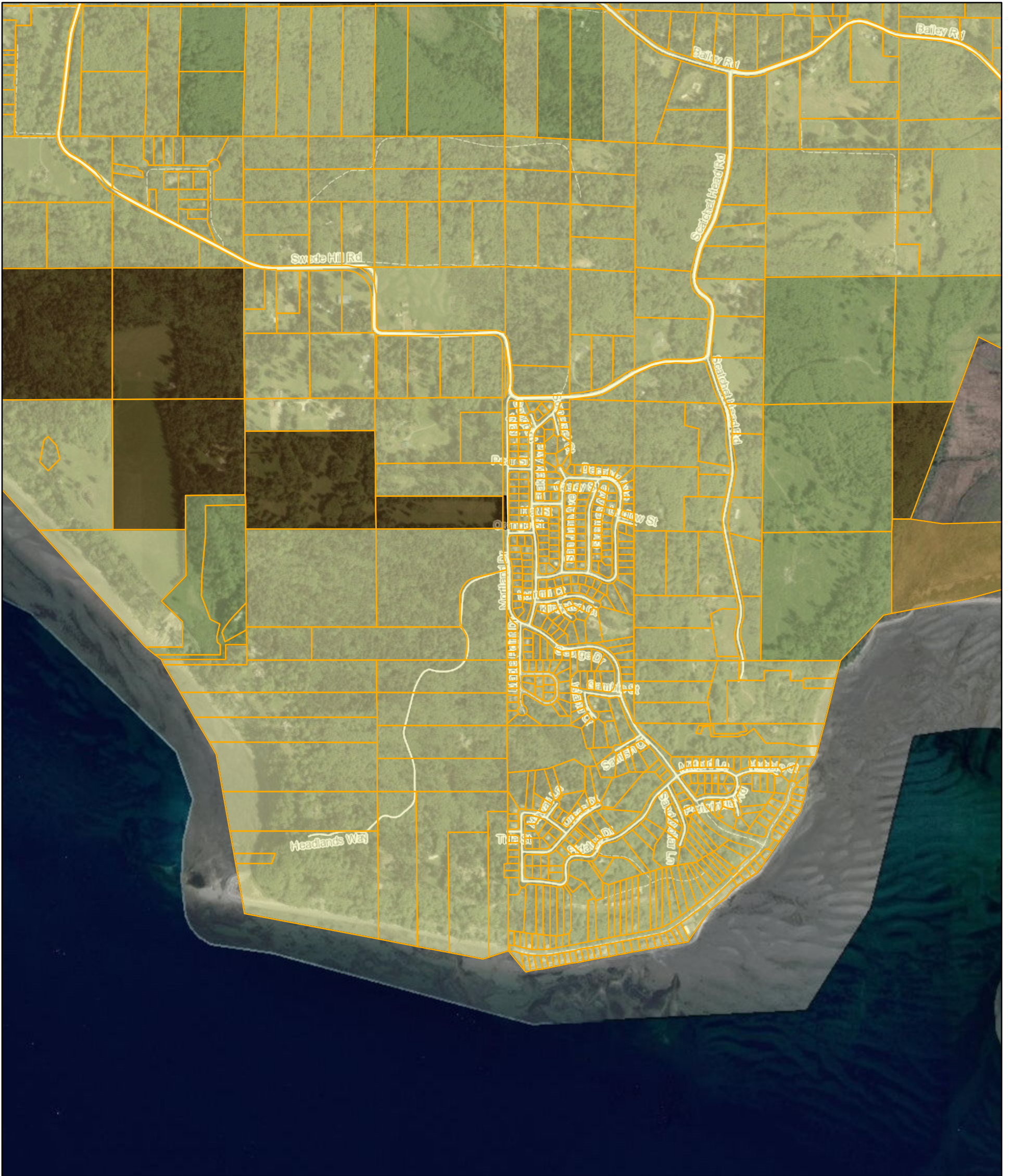
Department of Planning & Community Development

RURAL AREAS OF INTENSE DEVELOPMENT

5/3/2005



Scatchet Head Water District Land Use Map




5/8/2019, 10:31:53 AM


 Parcels

 Road Closures

Zoning

 Commercial Agriculture

 Rural


 Rural Agriculture


 Rural Forest


 One Way Directions

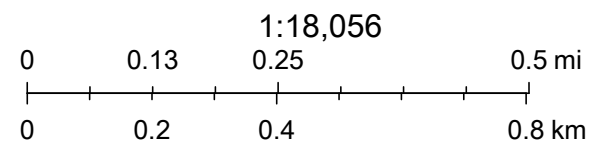
Roads

 Highway

 Collector and Arterial

 Local

 Private



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Island County

Land Use Interactive Map Export
DO NOT USE AS A LEGAL DOCUMENT, ACCURACY NOT GUARANTEED

APPENDIX E Water Facilities Inventory (WFI) Form

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WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO. 76470 X	2. SYSTEM NAME SCATCHET HEAD WATER DISTRICT	3. COUNTY ISLAND	4. GROUP A	5. TYPE Comm
------------------------------------	---	----------------------------	----------------------	------------------------

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)		410	451
A. Full Time Single Family Residences (Occupied 180 days or more per year)	410		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	0	0	0
28. TOTAL SERVICE CONNECTIONS		410	451

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 900

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
* Requirement is exception from WAC 246-290	1	1	1	1	1	1	1	1	1	1	1	1

34. NITRATE SCHEDULE	QUARTERLY	ANNUALLY	ONCE EVERY 3 YEARS
(One Sample per source by time period)			

35. Reason for Submitting WFI:

Update - Change
 Update - No Change
 Inactivate
 Re-Activate
 Name Change
 New System
 Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ **DATE:** _____

PRINT NAME: _____ **TITLE:** _____

APPENDIX F Water Right Certificates

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85010797
 STATE OF WASHINGTON
 DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)
- Ground Water (Issued in accordance with the provisions of Chapter 203, Laws of Washington for 1946, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE April 27, 1973	APPLICATION NUMBER G1-20574	PERMIT NUMBER G1-20574P	CERTIFICATE NUMBER G1-20574C
---------------------------------	--------------------------------	----------------------------	---------------------------------

NAME Scatchet Head Community Club - Grover Pell, Chairman			
ADDRESS (STREET) 6203 - 39th N. E.	(CITY) Seattle	(STATE) Washington	(ZIP CODE) 98115

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATER TO BE APPROPRIATED

SOURCE Well (No. 1)
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 90	MAXIMUM ACRE-FEET PER YEAR 101.1
-------------------------------	----------------------------------	-------------------------------------

QUANTITY, TYPE OF USE, PERIOD OF USE
Community domestic supply - continuously (483 services)

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
375 feet west and 2140 feet south of N $\frac{1}{4}$ corner - Sec. 15

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SW $\frac{1}{4}$ NW $\frac{1}{4}$	SECTION 15	TOWNSHIP N. 28	RANGE, (E. OR W.) W.M. 3E	W.R.I.A. 6	COUNTY Island
--	---------------	-------------------	------------------------------	---------------	------------------

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
-----	-------	------------------------------------

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Scatchet Head Water District within Sections 10 and 15,
T. 28N., R. 3E., W.M., Island County.

FILED- RECORDED
 VOL. 588
 PAGE 1991. REQUEST OF
 W.C. State Dept. of Ecology
 SEP 27 2 26 PM '85

H.H. FERRIS, AUDITOR
 ISLAND COUNTY, WASH.
 DEPUTY

Handwritten notes:
 Douglas Kelly
 10/1/73
 10/1/73

600
60

83010738
STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)
- Ground Water (Issued in accordance with the provisions of Chapter 283, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
June 11, 1980	G1-23621	G1-23621P	G1-23621C

NAME			
Scatchet Head Water District - Grover Pell, Chairman			
ADDRESS (SHRINK)	CITY	(STATE)	(ZIP CODE)
6203 - 39th N, E,	Seattle	Washington	98115

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
Well (No. 2)
TIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FOOT PER YEAR
	125	140.4

QUANTITY, TYPE OF USE, PERIOD OF USE
Community domestic supply - continuously (483 services)

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
850 feet south and 1278 feet west from the N $\frac{1}{4}$ corner of Sec. 15

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, E. OR W., W.M.	W.A.S.A.	COUNTY
NE $\frac{1}{4}$ NW $\frac{1}{4}$	15	28	3E	6	Inland

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Scatchet Head Water District within Sections 10 and 15, T. 28N., R. 3 E., W.M., Inland County.

FILED RECORDED
VOL. 508
NOV 1983 REQUEST OF
Ch. Sec. Dept. of Ecology
SEP 27 2 26 PM '85

H.H. FERRIER, AUDITOR
INLAND COUNTY, WASH.
D. [Signature] DEPUTY

*n. Douglas Kelly
P.O. Box 240
Clinton 98236*

600
60

83010738
STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

CERTIFICATE OF WATER RIGHT

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)
- Ground Water (Issued in accordance with the provisions of Chapter 283, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
June 11, 1980	G1-23621	G1-23621P	G1-23621C

NAME			
Scatchet Head Water District - Grover Pell, Chairman			
ADDRESS (SHRINK)	CITY	(STATE)	(ZIP CODE)
6203 - 39th N, E,	Seattle	Washington	98115

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATER TO BE APPROPRIATED

SOURCE
Well (No. 2)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FOOT PER YEAR
	125	140.4

QUANTITY, TYPE OF USE, PERIOD OF USE
Community domestic supply - continuously (483 services)

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
850 feet south and 1278 feet west from the N $\frac{1}{4}$ corner of Sec. 15

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, E. OR W., T.M.	W.A.S.A.	COUNTY
NE $\frac{1}{4}$ NW $\frac{1}{4}$	15	28	3E	6	Inland

RECORDED PLATTED PROPERTY		
LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Scatchet Head Water District within Sections 10 and 15, T. 28N., R. 3 E., W.M., Inland County.

FILED - RECORDED
VOL. 508
NOV 1983 REQUEST OF
Ch. Sec. Dept. of Ecology
SEP 27 2 26 PM '85

H.H. FERRIER, AUDITOR
INLAND COUNTY, WASH.
D. [Signature] DEPUTY

*n. Douglas Kelly
P.O. Box 240
Clinton 98236*

Permittee or its successor(s) shall submit in writing to the Department of Ecology, Northwest Regional Office, Redmond, Washington, during the months of April and August each year, the chloride concentration of the water pumped and static water level (pump off) of the well authorized by this permit. Depending on the results of this data collection, the withdrawal of ground water under this permit may be limited, or other appropriate action may be required, by Department of Ecology order, to prevent seawater intrusion into the subject aquifer.

SEP 16 1985

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.020.

This certificate of water right is specifically subject to relinquishment for nonuse of water as provided in RCW 90.14.180.

Given under my hand and the seal of this office at Redmond Washington, this 16th day of September, 1985.



Department of Ecology

by Joan K. Thomas
JOAN K. THOMAS, Regional Manager

FOR COUNTY USE ONLY

DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)
- Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE April 27, 1973	APPLICATION NUMBER G1-20574	PERMIT NUMBER	CERTIFICATE NUMBER
---------------------------------	--------------------------------	---------------	--------------------

NAME Scatchet Head Community Club			
ADDRESS (STREET) 3776 E. Driftwood Drive	(CITY) Clinton	(STATE) Washington	(ZIP CODE) 98236

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well (No. 1)
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 90	MAXIMUM ACRE-FEET PER YEAR 101.1
-------------------------------	----------------------------------	-------------------------------------

QUANTITY, TYPE OF USE, PERIOD OF USE
Community domestic supply - continuously (483 services)

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
375 feet west and 2140 feet south of N $\frac{1}{4}$ corner - Sec. 15

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) SW $\frac{1}{4}$ NW $\frac{1}{4}$	SECTION 15	TOWNSHIP N. 28	RANGE (E. OR W.) T.M. 3E	W.R.L.A. 6	COUNTY Island
--	---------------	-------------------	-----------------------------	---------------	------------------

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
-----	-------	------------------------------------

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Scatchet Head Water District within Sections 10 and 15,
T. 28N., R. 3E., W.M., Island County.

DESCRIPTION OF PROPOSED WORKS

G1-20574

10"x90' well, 5 Hp turbine pump, treatment system, 2-3000 gallon pressure tanks, booster pumps, and supply lines to service area.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Complete	Complete	Complete

REPORT

Background:

This application to withdraw 120 gpm from a well located about seven miles south of Clinton on Whidbey Island for community domestic supply was received on April 27, 1973 from Scatchet Head Community Club, Clinton, Washington.

Legal notice was published in the Whidbey Island Record on August 23 and 30, 1973. No protests have been received.

Investigation:

This proposal was field examined on September 24, 1984. It was found as described in the application. The well facilities are complete and in use. Supply lines are complete to all lots in the development. Mr. Gordon Pell, chairman, stated that the pumping rate is now 90 gpm.

A check of the Department of Ecology's records shows no other wells within the SW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 15.

The applicant has another well also connected to the same water system. That well, No. 2, in NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 15, is about 1500 feet northwest of Well No. 1 of this application. An application has been made under G1-23621, with priority date of June 11, 1980, for 250 gpm for well No. 2. The applicant has requested that each well have a separate water right.

The Department of Ecology Quantity Allocation Guidelines indicate that 0.5-1.0 acre-foot of water per year per service is required in this area. Since the reported consumption in this area averages 0.36 acre-foot per year per service, 0.5 acre-foot per year per service will be allocated here (Department of Social and Health Services public water supply system listing, January 19, 1984).

The well for this application (No. 1) is estimated to be sited about 20 feet above mean sea level. Since the well is reported to be 90 feet deep, this places the bottom of the well about 70 feet below mean sea level. The closest seawater is Cultus Bay, about 200 feet to the southeast.

Water analysis reports submitted show 9.2 grams of chloride per gallon on February 26, 1972, and 8.4 grams per gallon on August 17, 1972. These values convert to about 157 and 144 milligrams per liter, respectively, of chlorides. Water taken from the well on December 16, 1984 was found to contain 240 mg/L of chloride (Lauck's Testing Labs., Seattle, WA). These chloride levels may indicate that seawater intrusion into the aquifer is occurring as a consequence of pumping this well.

Conclusion:

It is concluded that water is available for appropriation for the beneficial use requested. Such use will not have an adverse affect on existing rights or be detrimental to the public welfare if seawater intrusion is not caused as a consequence of pumping the well.

Recommendation:

It is recommended that this application for 120 gpm be reduced and a permit issued for 90 gpm, 101.1 acre-feet per year for community domestic supply - continuously - subject to existing rights and indicated provisions.

When the chloride concentration in water pumped from this well equals or exceeds 250 mg/L, either all pumping will cease or means to decrease the concentration of chlorides will be initiated. (Raising the pump intake above mean sea level or decreasing the instantaneous withdrawal rate are options that may result in decreased chloride incidence.)

Permittee or its successor(s) shall submit in writing to the Department of Ecology, Northwest Regional Office, Redmond, Washington, during the months of April and August each year, the chloride concentration of the water pumped and static water level (pump off) of the well authorized by this permit. Depending on the results of this data collection, the withdrawal of ground water under this permit may be limited, or other appropriate action may be required, by Department of Ecology order, to prevent seawater intrusion into the subject aquifer.

REPORT BY:

[Handwritten Signature]

DATE:

3-27-85

**REPORT OF EXAMINATION
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON**

- Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)
- Ground Water (Issued in accordance with the provisions of Chapter 253, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE June 11, 1980	APPLICATION NUMBER GI-23621	PERMIT NUMBER	CERTIFICATE NUMBER
--------------------------------	--------------------------------	---------------	--------------------

NAME Scatchet Head Water District			
ADDRESS (STREET) 3776 E. Driftwood Drive	(CITY) Clinton	(STATE) Washington	(ZIP CODE) 98236

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Well (No. 2)		
TRIBUTARY OF (IF SURFACE WATERS)		
MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 125	MAXIMUM ACRE-FEET PER YEAR 140.4
QUANTITY, TYPE OF USE, PERIOD OF USE Community domestic supply - continuously (483 services)		

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL 850 feet south and 1278 feet west from the N $\frac{1}{2}$ corner of Sec. 15
--

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NE $\frac{1}{4}$ NW $\frac{1}{4}$	SECTION 15	TOWNSHIP N. 28	RANGE, (E. OR W.) W.M. 3E	W.R.I.A. 6	COUNTY Island
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
-----	-------	------------------------------------

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Area served by Scatchet Head Water District within Sections 10 and 15,
T. 28N., R. 3 E., W.M., Island County.

DESCRIPTION OF PROPOSED WORKS

G1-23621
 Well No. 2 (of 2), submersible pump, 2-3000 gallon storage tanks and
 4" and 6" mains to place of use.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Complete	Complete	Complete

REPORT

Background:

This application to withdraw 250 gpm from a well located about seven miles south of Clinton on Whidbey Island, for municipal supply, was received on June 11, 1980 from Scatchet Head Water District, Clinton, Washington.

Legal notice was published in the Whidbey Island Record on August 12 and 19, 1980. No protests have been received.

Investigation:

A field examination was conducted on September 24, 1984. The water system at Scatchet Head - consisting of two wells - is complete and in use. It was found as described in the application.

Scatchet Head Community Club has previously made Application G1-20574, with priority date of April 27, 1973, for well No. 1 of the system (the well under instant application is well No. 2). Well No. 1 is located about 1500 feet southeast of well No. 2 in SW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 15. Well No. 2, in NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 15, is located about 850 feet south and 1278 feet west from the N $\frac{1}{4}$ corner of Sec. 15, T. 28N., R. 3E.W.M., Island County.

Mr. Grover Pell, Chairman of the water district, was interviewed by telephone on November 15, 1984 and gave the following information: Wells 1 and 2 are installed to the complete system. Well No. 1 yields 90 gpm and well No. 2 yields 125 gpm to the two 3000 gallon storage tanks. The wells are pumped alternately. Booster pumps supply service pressure from the tanks. There are now about 175 homes using water, with a potential of 483. The system is now called the Scatchet Head Water District. The water from well No. 1 was described as being of bad quality, containing methane, chlorides and other constituents which make the water unacceptable. For this reason, and to provide a greater instantaneous quantity of water, well No. 2 was installed. Water from the two wells is mixed and treated to obtain water that is acceptable to the district. Mr. Pell requested that each well be granted a separate water right.

The water well report for well No. 2 shows that it was installed by Martel Well Drilling Inc., Friday Harbor, Washington. The well is 10 inches in diameter and 295 feet deep. It was completed on May 5, 1980, with a static water level of 190 feet. The well is cased from 3 feet above ground to 287 feet below, and perforated from 242 feet to 246 feet; no screen is indicated. A pump test by the driller on April 30, 1980 yielded 250 gpm with a 40-foot drawdown in 6 hours, with the water level remaining stable at 230 feet for an additional 6 hours. Recovery to 190 feet occurred in 4 minutes.

Well No. 2 is sited at an elevation of about 202 feet above mean sea level. The closest saltwater is Cultus Bay, about 1800 feet to the southeast. The bottom of the well casing is thus about 85 feet below mean sea level and the lowest perforations in the casing about 44 feet below mean sea level.

A report submitted by the applicant shows water taken from well No. 2 on December 16, 1984 was found to contain 14 mg/L of chloride (Lauck's Testing Labs., Seattle, WA).

A review of the Department of Social and Health Services public water supply system listing, dated January 19, 1984, indicates that water usage reported in the applicant's area averages about 0.36 acre-foot per year per service. Since the Department of Ecology's Quantity Allocation Guidelines provide 0.5-1.0 acre-foot per year per service, the 0.5 acre-foot per service will be allocated here. G1-20574 provides 101.1 acre-feet so this well can provide the additional 140.4 acre-feet needed.

Conclusion:

It is concluded that water is available for the beneficial appropriation as requested. Such use will not have an adverse affect on existing rights or be detrimental to the public welfare so long as the well pump intake and withdrawal rate are such that there is no degradation of the aquifer caused by pumping the well. It is also concluded that the requested 250 gpm should be reduced to the pumping rate of 125 gpm. Permit should therefore issue subject to existing rights and indicated provisions.

Recommendation:

It is recommended that a permit be issued for 125 gpm, 140.4 acre-feet per year (in addition to G1-20574), for the community domestic supply - continuously - of 483 services.

Permittee or its successor(s) shall submit in writing to the Department of Ecology, Northwest Regional Office, Redmond, Washington, during the months of April and August each year, the chloride concentration of the water pumped and static water level (pump off) of the well authorized by this permit. Depending on the results of this data collection, the withdrawal of ground water under this permit may be limited, or other appropriate action may be required, by Department of Ecology order, to prevent seawater intrusion into the subject aquifer.

REPORT BY:

Jim Gaudin

DATE:

3.27.85



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

NOTICE OF APPLICATION TO CHANGE AN EXISTING WATER RIGHT

TAKE NOTICE:

That SCATCHET HEAD WATER DISTRICT

of CLINTON, WASHINGTON, on APRIL 3, 1997, has filed an application of change to GROUND WATER CERTIFICATE G1-20574C.

Certificated use is for 90 gpm, 101.1 acre-feet per year for COMMUNITY DOMESTIC SUPPLY, as granted under Ground Water Right G1-20574C, priority date APRIL 27, 1973. That the original point of withdrawal is located in SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 15, Township 28, Range 3E W.M., ISLAND County. The

place of use is located within AREA SERVED BY SCATCHET HEAD WATER DISTRICT WITHIN SECTIONS 10 & 15, TOWNSHIP 28N, RANGE 3E, ISLAND COUNTY, WASHINGTON.

The request here is to ADD AN ADDITIONAL POINT OF WITHDRAWAL LOCATED IN THE NE $\frac{1}{4}$ NW $\frac{1}{4}$ OF SECTION 15, TOWNSHIP 28N, RANGE 3E, ISLAND COUNTY, WASHINGTON.

No increase will be made to the instantaneous diversion/withdrawal rate or annual quantity.

Protests or objections to approval of this application must include a detailed statement of the basis for objections: protests must be accompanied by a two (\$2.00) recording fee and filed with the Department of Ecology at the address shown below, within thirty (30) days from

(Last date of publication to be entered above by publisher)

Department of Ecology
Northwest Regional Office
3190 - 160th SE
Bellevue, WA 98008

APPENDIX G Well Site Approval

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Island County Health Department

P.O. BOX 5000 • COUPEVILLE, WA 98239-5000

N. WHIDBEY: 360/679-7350 • S. WHIDBEY: 360/321-5111 • CAMANO: 360/629-4522

July 31, 1995

Grover Pell, Manager
Scatchet Head Water District
8042 S. George Drive
Clinton, WA 98236

RE: Well Site Approval
Scatchet Head Water District
Parcel #S8110-00-12018-2
Form #53/95

Dear Mr. Pell:

This office has inspected the proposed well site to serve the Scatchet Head Water District. The well site is not located in an optimum location with respect to the siting requirements of WAC 246-290 but can be approved if mitigation measures are implemented to reduce the potential for direct influence from surface water sources. The well site is hereby approved contingent upon engineering justification and implementation of mitigation measures addressing the following items:

1. The proposed well site is located adjacent (within 50 feet) of George Drive. Surface drainage from this road and right-of-way should be directed away from the well head.
2. A drainage/stream corridor was identified just west of the proposed well site. Coordination with Island County Planning and Community Development is required prior to conducting any work on the subject property.

Approval of the site is also contingent upon the recording of covenant for a pollution control radius:

3. Well site approval is contingent upon the recording of well covenants for a one hundred (100) foot pollution control radius around the well (form enclosed). Covenants serve to protect the drinking water supply from potential contamination. The declaration of covenant is to be completed by the owner of the well site property. If the pollution control radius overlaps neighboring properties a Restrictive Covenant will also be required. Separate covenants with the respective owner signatures should be recorded for each parcel involved. Please submit recorded copies of these forms to this office. Recording of these documents can be completed in the Island County Auditor's office.

Grover Pell, Manager
July 31, 1995
Page 2

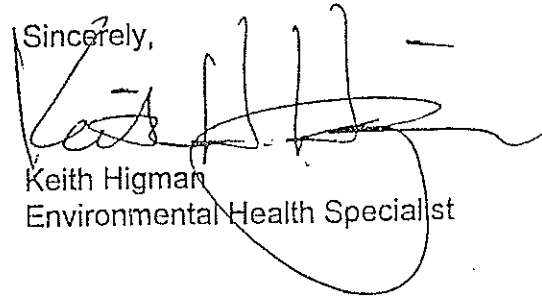
The well site is located in an area of low risk with regards to seawater intrusion.

Installation of a water system prior to obtaining necessary approvals is in violation of WAC 246-290 and will impede water system approval. Please also be advised that any movement of the identified well site without written consent from this office may negate well site approval.

Water system plans and specifications will require state Department of Health (DOH) approval prior to putting the well on line. Please contact DOH in Seattle at 206-464-5401 for water system submittal requirements.

Please feel free to contact me if you have any questions regarding this correspondence or the water system application process.

Sincerely,

A handwritten signature in black ink, appearing to read 'Keith Higman', with a large, sweeping flourish underneath.

Keith Higman
Environmental Health Specialist

Enclosures

cc: Planning
Derek Pell

Island County Health Department
P.O. Box 5000
Coupeville, WA 98239

Receipt Number: 62134
Form Number: 53/95
Application Date: 5/30/95

APPLICATION FOR WELL SITE INSPECTION

1. Well is to be used for: Individual System (single-family residence). Fee required \$130.00.
 Public System (other than single family). Fee required \$280.00.
2. New Well * 483 Existing Well ** 483
*Number of services planned **Number of services connected
(Well #3 is a replacement well) and
#1 ** 310
**Number of services planned
3. Submit well log for existing well(s) with Application.
4. On the back of this form, please draw an accurate sketch of the well site location and proposed service area.
5. Are any lots (to be) served one acre or less? yes
6. Name of water system (proposed or existing): Scatchet Head Water Dist
7. Person responsible for system: GROVER PELL MANAGER
Name
579-1868 8042 - SO. GEORGE DR.
Phone Number Address
CLINTON WA 98236
Address
8. Owner of well site property: Scatchet Head Water Dist.
Name
579-2515 3792 E Hubble Ct.
Phone Number Address
CLINTON, WA. 98236
Address
9. Person applying for well site inspection (agent, etc.): GROVER PELL
Name
579-1868 8042 - SO. GEORGE DR.
Phone Number Address
CLINTON WA. 98236
Address

WITHOUT THE ABOVE INFORMATION YOUR APPLICATION WILL NOT BE PROCESSED!

**** FOR HEALTH DEPARTMENT USE ONLY ****

WELL SITE APPROVAL

COVENANTS RECEIVED

RECEIVED

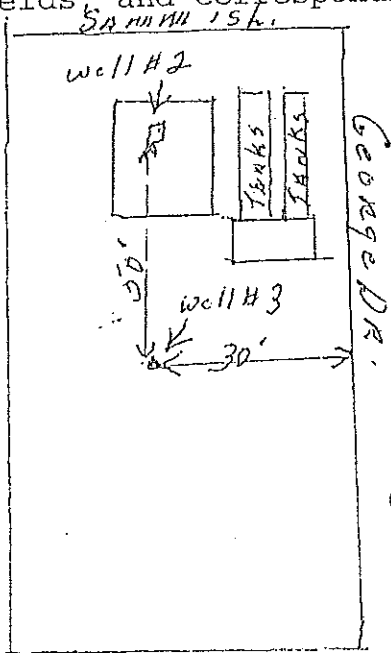
MAY 30 1995

ISL. CTY. HEALTH DEPT.

DATE

DATE

Show adjacent buildings, roads, property lines, septic tanks, drainfields, and corresponding distances to the well site.



Well #2 - G1-23621P
 Certificate # G1-20574C

Well #3 is to replace Well #1.
 Well #1 - G120574P.
 Certificate # G1-20574C

(Well #1 - Sec. 15 - Township 28 Range 3E)

The proposed well site must be clearly located on the site with a flagged stake

10. Legal description of well site property:

Tax Parcel # 58110-00-12018-2

Sec. 15 Twp. 28 Rge. 3E, W.M.

Is this well to serve a proposed short plat? _____ S/P # _____

Address of well site (if available) B/K: 12 - Lot 18 sketch Herd.

I/We request that a well site inspection be made by the Island County Health Department at the above described well site.

5-30-1995
 Date

[Signature]
 Signature of well site property owner

**Note: This application does not constitute well site approval.

.Well site approval is subject to pollution control zone covenants recorded at the Island County Auditor's Office (copy to be furnished to Health Department).

.Any public system proposed is subject to review and approval by Washington State Department of Health and Island County Health Department per WAC 246-290.

.Pursuant to the Island County Coordinated Water System Plan, written verification from adjacent water system(s) must be submitted to the Health Department prior to well site inspection.

APPENDIX H Well Logs and Pump Curves

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WATER WELL REPORT

Start Card No. W067766
 Unique Well I.D. # ABW832
 Water Right Permit No.

STATE OF WASHINGTON

(1) OWNER: Name SCATCHET HEAD WATER DIST. Address 4010 STONE WAY NORTH SEATTLE, WA 98103-

LOCATION OF WELL: County - SE 1/4 NW 1/4 Sec 15 T 20N N., R 3E WM
 (2a) STREET ADDRESS OF WELL (or nearest address) CLINTON, WA.-ISLAND CO.,

(3) PROPOSED USE: DOMESTIC

(10) WELL LOG

(4) TYPE OF WORK: Owner's Number of well
 (If more than one)
 NEW WELL Method: ROTARY

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

(5) DIMENSIONS: Diameter of well 8 inches
 Drilled 403 ft. Depth of completed well 246 ft.

MATERIAL	FROM	TO
BROWN SAND AND GRAVEL	0	5
SANDY GRAY CLAY	5	16
GRAY CLAY STICKY	16	109
GRAY CLAY BLACK SAND PEA GRAVEL	109	115
GRAY CLAY PINK BLACK SAND	115	123
GRAY STICKY CLAY	123	147
GRAY CLAY BLACK SAND SOME GRAVEL	147	165
SMELLY BROWN CLAY	165	168
BROWN CLAY BLACK SAND PEA GRAVEL	168	172
GRAY CLAY BLACK SAND PEA GRAVEL	172	178
PEA GRAVEL COURSE SAND WATER	178	182
BLACK PEA GRAVEL GRAY CLAY	182	222
SILTY SANDY BLACK CLAY	222	227
STICKY GRAY CLAY PEA GRAVEL	227	233
BLACK PEA GRAVEL WATER BEARING	233	234
BLACK COURSE SAND	234	236
BLACK COURSE SAND	236	247
BLACK PACKED COURSE SAND	247	255
BLACK COURSE SAND GRAY CLAY	255	318
SANDY GRAY SHALE	318	325
FINE BLACK SAND GRAY CLAY	325	345
GRAY CLAY	345	353
FINE BLACK SAND GRAY CLAY	353	375
HARD GRAY CLAY	375	403

(6) CONSTRUCTION DETAILS:

Casing installed: 8 " Dia. from +1.5 ft. to 403 ft.
 WELDED CASING " Dia. from ft. to ft.
 " Dia. from ft. to ft.

Perforations: YES

Type of perforator used AIR PERFORATOR
 SIZE of perforations 3/8 in. by 1 in.
 24 perforations from 231 ft. to 234 ft.
 perforations from ft. to ft.
 perforations from ft. to ft.

Screens: NO

Manufacturer's Name
 Type Model No.
 Diam. slot size from ft. to ft.
 Diam. slot size from ft. to ft.

Gravel packed: NO Size of gravel
 Gravel placed from ft. to ft.

Surface seal: YES To what depth? 35 ft.
 Material used in seal BENTONITE
 Did any strata contain unusable water? NO
 Type of water? Depth of strata ft.
 Method of sealing strata off

*Cementation 403-246
 (Type in)*

(7) PUMP: Manufacturer's Name
 Type H.P.

(8) WATER LEVELS: Land-surface elevation
 above mean sea level ... ft.
 - Static level ft. below top of well Date 10/24/95
 Artesian Pressure lbs. per square inch Date
 Artesian water controlled by

Work started 10/02/95 Completed 10/24/95

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Was a pump test made? NO If yes, by whom?
 Yield: gal./min with ft. drawdown after hrs.

Recovery data
 Time Water Level Time Water Level Time Water Level

NAME ARCADIA DRILLING INC.
 (Person, firm, or corporation) (Type or print)

ADDRESS SE 170 WALKER PARK RD

Date of test / /
 Bailer test gal/min. ft. drawdown after hrs.
 Air test gal/min. w/ stem set at ft. for hrs.
 Artesian flow g.p.m. Date
 Temperature of water Was a chemical analysis made? NO

[SIGNED] _____ License No. 20530950

Contractor's
 Registration No. ARCADDIO98K1 Date 10/26/95

B & W PUMP COMPANY
 1508 E. State Hwy. 525 P. O. Box 55
 FREELAND, WASHINGTON 98249
 (206) 321-4016 (206) 221-2227

JOB _____
 SHEET NO. _____ OF _____
 CALCULATED BY _____ DATE _____
 CHECKED BY _____ DATE _____
 SCALE _____

Scatchet Head Water District
 % GROVER PELL
 8042 S. George Dr.
 Clinton Wa. 98236

Bid

8" well
 246' Depth
 193'-2" Static
 220' 66 gpm

8" x 2" Weld-on Pitless Adapter	---	\$210. ⁰⁰
8" Aluminum Well Cover	---	52.50
7 1/2 H.P. 230 Volts 3Ø Subm. Pump 3 wire	---	2439. ⁰⁰
Flint & Walling (4" 85 gpm 15 stage)	---	
2 1/2" Check Valve	---	48.25
231' - 2 1/2" Galv. Pipe	3.00/ft	693. ⁰⁰
235' #10 x 4 Pump Wire	.75/ft	176.25
3 - 8" x 2 1/2" Pipe Stabilizers	14.50/ea	43.50
Magnetic Starter + Heaters 3Ø	---	305. ⁰⁰
2 hours Labor setting Pump + Pitless Adapter	60%/hr	120. ⁰⁰

4087.50
 SS TAX 322.90

 \$4,410.40

331-4016

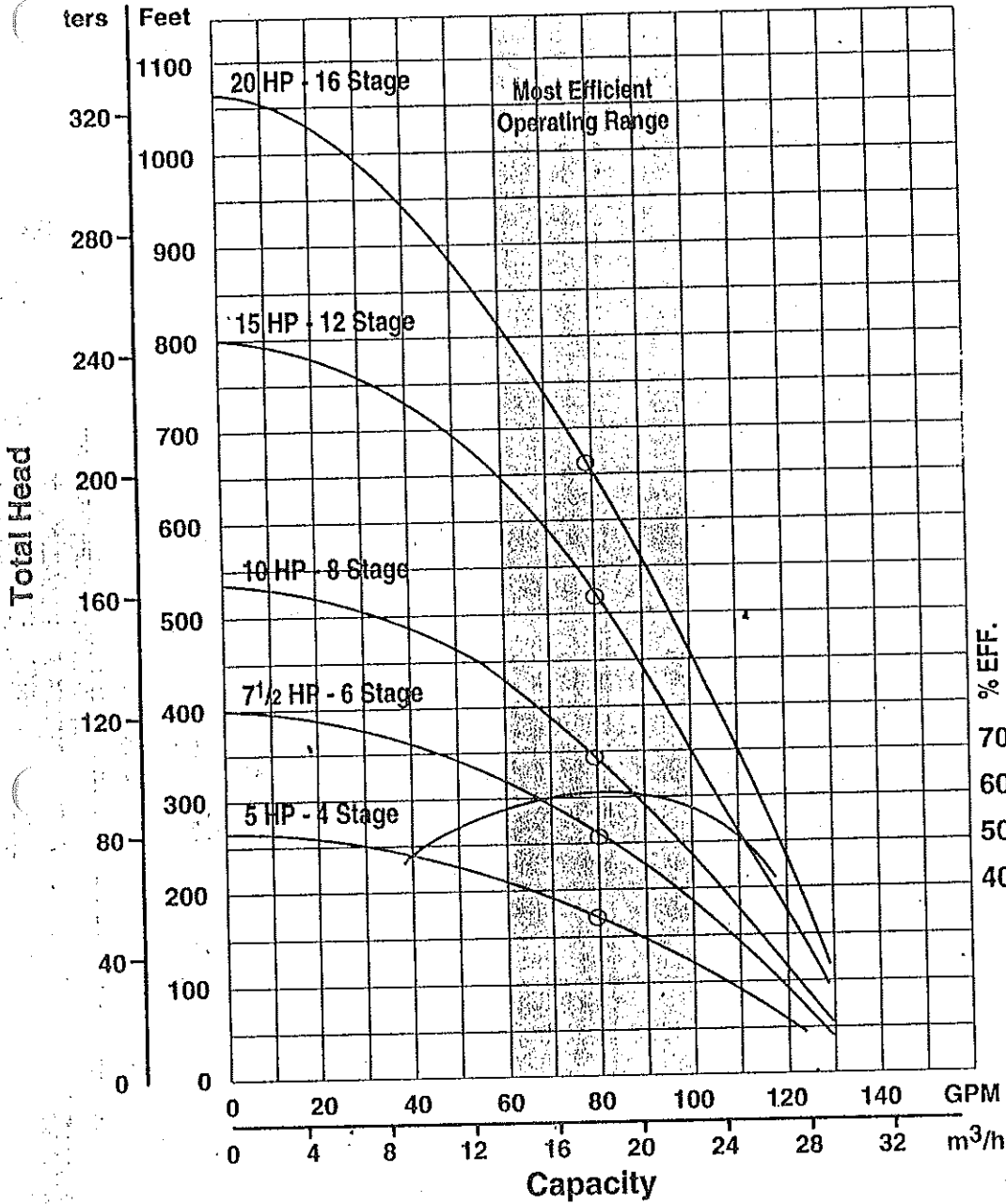
Dwight Lehman
 12-10-96

WELL # 3

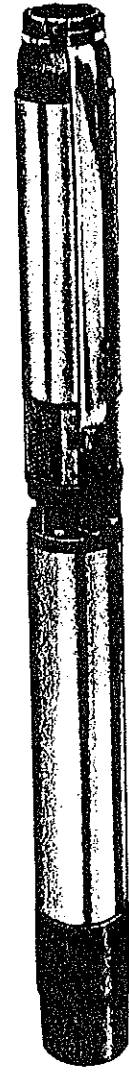


80 GPM • 5 thru 20 HP • 3450 RPM • 60 Hz • 6P

(100 - more)



3" NPT



5 7/8"

80 GPM • Weight And Length Data "6P"

MODEL NO.	H.P.	NO. OF STAGES	PHASE	LENGTH-INCHES		SHIPPING WEIGHT	
				PUMP	MOTOR	PUMP	MOTOR
6P080A05	5	4	1	21.5	29.5	40	69
			3	21.5	23.5	40	53
6P080A07	7 1/2	6	1	28.4	28.0	45	120
			3	28.4	24.2	45	95
6P080A10	10	8	1	31.3	30.6	49	135
			3	31.3	25.4	49	105
6P080A15	15	12	1	41.2	33.1	56	146
			3	41.2	28.0	56	120
6P080A20	20	16	3	51.1	30.6	73	135

* Motor 4" diameter — discharge pipe size 3" — check valve not furnished.

PIONEER PUMPS, INC.

SHOP DRAWING REVIEW

- NO EXCEPTIONS TAKEN
- MAKE CORRECTIONS NOTED
- AMEND AND RESUBMIT
- REJECTED - RESUBMIT

Checking is only for conformance with the design concept of the project and compliance with the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

BY George Hammond

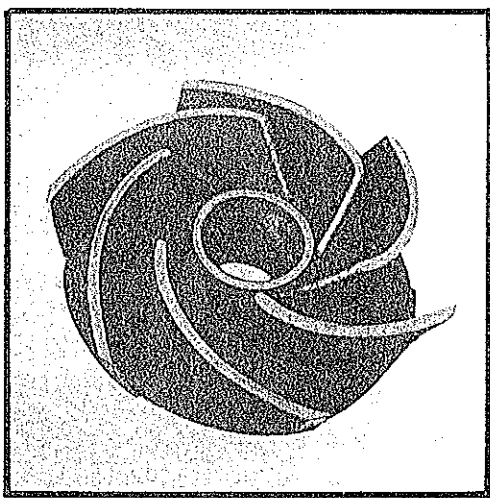
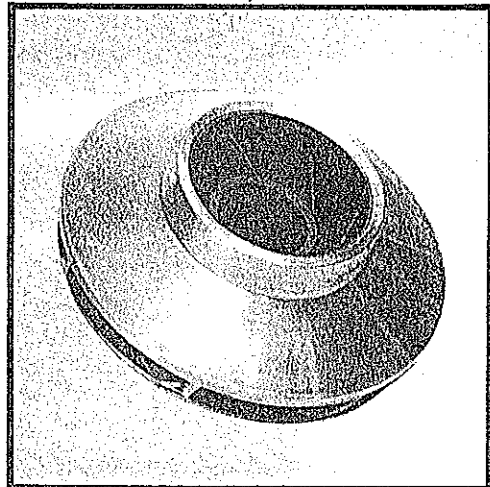
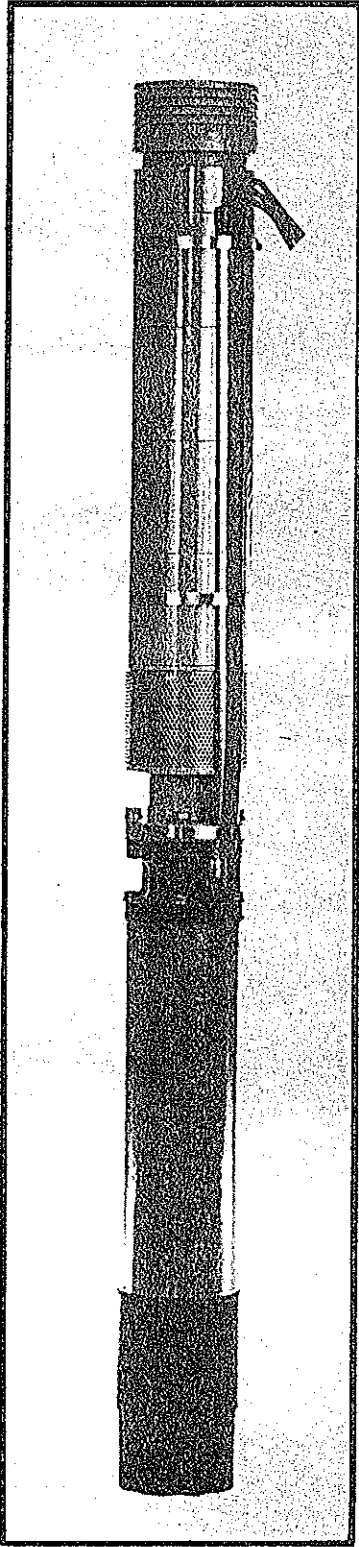
DATE 9-18-80

RAMOND, COLLIER & WADE-LIVINGSTONE ASSOCIATES, INC.
CONSULTING ENGINEERS

4010 STONE WAY NORTH
SEATTLE WASHINGTON 98103

PIONEER

See Pump Curve Sheet.



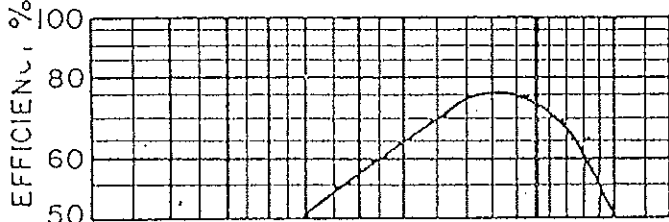
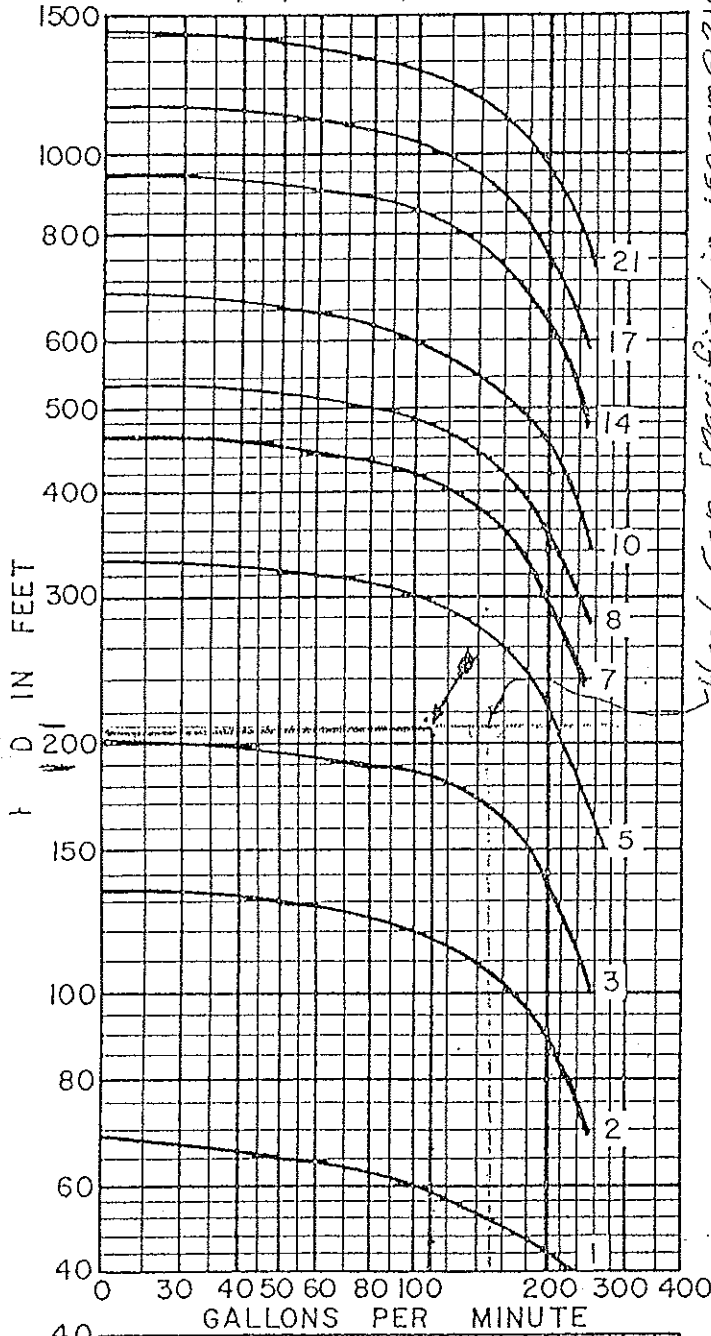
PIONEER

PE 175

SELECTION CURVES

60 HERTZ

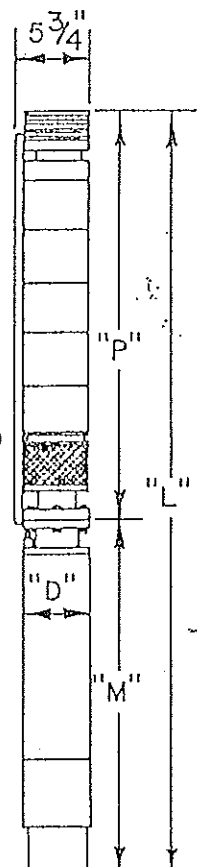
100 TO 250 G.P.M.



Head-Cap. Specified is 150gpm @ 210 TDH.
 Use 4 stage pump or trim 5 impellers
 Power Demand not to exceed 15 H.P. at any condition
 Use "Franklin" motor or equal. *RFB*

NO. STGS.	MODEL	HP	VOLTS	F.L.A.
1	PE17512H	3	230	16.5
	PE17532H		230	11.4
	PE17534H		460	5.7
2	PE17512K	7½	230	40.0
	PE17532K		230	26.8
	PE17534K		460	13.4
3	PE17512L	10	230	52.0
	PE17532L		230	32.0
	PE17534L		460	16.0
5	PE17532M	15	230	46.6
	PE17534M		460	23.3
7	PE17532N	20	230	61.0
	PE17534N		460	30.5
8	PE17532P	25	230	75.0
	PE17534P		460	37.5
10	PE17532R	30	230	92.0
	PE17534R		460	46.0
14	PE17534S	40	460	60.0
17	PE17534T	50	460	75.0
21	PE17534U	60	460	89.0

Service Factor 1.15



ENCLOSED IMPELLER

23 223	2.0
IMP. DRG.	K
23 000	3450
BOWL DRG.	R.P.M.
5 3/8	5.35
BOWL DIA.	EYE AREA

DIMENSIONS

Discharge Size: 4" N.P.T.

NO. STGS.	HP	D	M	P	L
1	3	3.75	28.0	17.3	45.3
2	7½		30.7	21.0	51.7
3	10	5.37	34.4	24.8	59.2
5	15		34.4	32.3	66.7
7	20		38.4	39.8	78.2
8	25	5.37	42.4	43.6	86.
10	30		42.4	51.1	93.5
14	40		68.8	66.1	134.9
17	50	5.37	76.8	77.4	154.2
21	60		111	92.35	203.35

Dimensions in Inches

WEL
 SIZ
 6

APPENDIX I Water Rights Self-Assessment

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Water Right Self-Assessment Form for Water System Plan

Mouse-over any link for more information. Click on any link for more detailed instructions.

<u>Water Right Permit, Certificate, or Claim #</u> <small>*If water right is interruptible, identify limitation in yellow section below</small>	<u>WFI Source #</u> <small>If a source has multiple water rights, list each water right on separate line</small>	<u>Existing Water Rights</u> <small>Qi= Instantaneous Flow Rate Allowed (GPM or CFS) Qa= Annual Volume Allowed (Acre-Feet/Year) This includes wholesale water sold</small>				<u>Current Source Production – Most Recent Calendar Year</u> <small>Qi = Max Instantaneous Flow Rate Withdrawn (GPM or CFS) Qa = Annual Volume Withdrawn (Acre-Feet/Year) This includes wholesale water sold</small>				<u>10-Year Forecasted Source Production (determined from WSP)</u> <small>This includes wholesale water sold</small>				<u>20-Year Forecasted Source Production (determined from WSP)</u> <small>This includes wholesale water sold</small>			
		<u>Primary Qi</u> <small>Maximum Rate Allowed</small>	<u>Non-Additive Qi</u> <small>Maximum Rate Allowed</small>	<u>Primary Qa</u> <small>Maximum Volume Allowed</small>	<u>Non-Additive Qa</u> <small>Maximum Volume Allowed</small>	<u>Total Qi</u> <small>Maximum Instantaneous Flow Rate Withdrawn</small>	<u>Current Excess or (Deficiency) Qi</u>	<u>Total Qa</u> <small>Maximum Annual Volume Withdrawn</small>	<u>Current Excess or (Deficiency) Qa</u>	<u>Total Qi</u> <small>Maximum Instantaneous Flow Rate in 10 Years</small>	<u>10-Year Forecasted Excess or (Deficiency) Qi</u>	<u>Total Qa</u> <small>Maximum Annual Volume in 10 Years</small>	<u>10-Year Forecasted Excess or (Deficiency) Qa</u>	<u>Total Qi</u> <small>Maximum Instantaneous Flow Rate in 20 Years</small>	<u>20-Year Forecasted Excess or (Deficiency) Qi</u>	<u>Total Qa</u> <small>Maximum Annual Volume in 20 Years</small>	<u>20-Year Forecasted Excess or (Deficiency) Qa</u>
1. G1-23621C	S02	125.0 gpm		140.4		125.0 gpm	0.0	44.0	96.4	125.00	0.0	61.0	79.4	125.0 gpm	0.0 gpm	95.7	44.7
2. G1-20574P	S03	90.0 gpm		101.0		66.0 gpm	24.0 gpm	23.2	77.8	66.0	24.0	32.1	68.9	66.0 gpm	24.0 gpm	50.5	50.5
3																	
4																	
5																	
6																	
TOTALS =		215.0 gpm		241.4		191.0 gpm	24.0 gpm	67.2	174.2	191.0 gpm	24.0 gpm	93.1	148.3	191.0 gpm	24.0 gpm	146.2	95.2

Column Identifiers for Calculations: A B C =A-C D =B-D E = A-E F =B-F G =A-G H =B-H

PENDING WATER RIGHT APPLICATIONS: Identify any water right applications that have been submitted to Ecology.					
Application Number	New or Change Application?	Date Submitted	Quantities Requested		
			Primary Qi	Non-Additive Qi	Primary Qa
n/a					

INTERTIES: Systems receiving wholesale water complete this section. Wholesaling systems must include water sold through intertie in the current and forecasted source production columns above.															
Name of Wholesaling System Providing Water	Quantities Allowed In Contract		Expiration Date of Contract	Currently Purchased <small>Current quantity purchased through intertie</small>				10-Year Forecasted Purchase <small>Forecasted quantity purchased through intertie</small>				20-Year Forecasted Purchase <small>Forecasted quantity purchased through intertie</small>			
	<u>Maximum Qi</u> <small>Instantaneous Flow Rate</small>	<u>Maximum Qa</u> <small>Annual Volume</small>		<u>Maximum Qi</u> <small>Instantaneous Flow Rate</small>	<u>Current Excess or (Deficiency) Qi</u>	<u>Maximum Qa</u> <small>Annual Volume</small>	<u>Current Excess or (Deficiency) Qa</u>	<u>Maximum Qi</u> <small>10-Year Forecast</small>	<u>Future Excess or (Deficiency) Qi</u>	<u>Maximum Qa</u> <small>10-Year Forecast</small>	<u>Future Excess or (Deficiency) Qa</u>	<u>Maximum Qi</u> <small>20-Year Forecast</small>	<u>Future Excess or (Deficiency) Qi</u>	<u>Maximum Qa</u> <small>20-Year Forecast</small>	<u>Future Excess or (Deficiency) Qa</u>
1. n/a															
2															
3															
TOTALS =															

Column Identifiers for Calculations: A B C =A-C D =B-D E =A-E F =B-F G =A-G H =B-H

INTERRUPTIBLE WATER RIGHTS: Identify limitations on any water rights listed above that are interruptible.		
Water Right #	Conditions of Interruption	Time Period of Interruption
1. n/a		
2. n/a		
3		

ADDITIONAL COMMENTS:

APPENDIX J Well Head Protection Program

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Wellhead Protection Program

A. REQUIREMENT FOR PROGRAM

Section 1428 of the 1986 Amendments to the Federal Safe Drinking water Act mandates that every state develop a wellhead protection program. The Washington Department of Health is designated lead agency for wellhead protection program development and administration. The Safe Drinking Water Act requires that all federally defined public water systems (Group A systems) using ground water as their source implement a wellhead protection program. The minimum elements of a program required by the Washington Department of Health are:

- A delineated wellhead protection area for each well, well field, or spring.
- An inventory within the wellhead protection area of all potential sources of ground water contamination.
- A management plan to reduce the likelihood that potential contaminant sources will pollute the drinking water supply.
- Contingency plans for providing alternate sources of drinking water in the event that contamination does occur.
- Inclusion of public participation while the program is developing.

B. DESCRIPTION OF GROUNDWATER SOURCES

The Water District has two wells located on a District owned lot that also contains a pump house. The wells can be described as follows:

	Well #2	Well #3
WA DOH Source No.	S02	S03
Surface elevation:	200 ft	200 ft
Depth:	242	246 ft
Static level:	184 ft	184 ft
Date of Construction:	1980	1997
Casing:	10-inch	8-inch
Production rate:	144 gpm	80 gpm

Wellhead Protection Program

The wells are completed in a sand and gravel aquifer exhibiting confined aquifer characteristics. The 100-foot sanitary control radius for both wells lie within the property owned by the District or the adjoining County road right-of-way.

C. PROGRAM OBJECTIVE

The objective of the wellhead protection program of the Scatchet Head Water District (DOH ID #76407X) are:

- 1) to reasonably reduce the risk of contamination of the ground water supplying the Purveyor's well sources, and
- 2) with other utilities, cooperated and support the Island County aquifer protection program.

D. RELATED PROGRAMS

The disposal of hazardous chemicals in general, is regulated by Island County, Chapter 8.08A I.C.C. through the exercise of the Board of Health function established through Chapter 70.05 of the Revised Code of Washington. The regulations include collection and storage household hazardous waste and moderate-risk waste.

Groundwater resource (aquifer) protection regulations are enforced by Island County, Chapter 8.09 I.C.C.

On-site sewerage disposal systems are regulated by Island County, Chapter 8.07B I.C.C.

Transportation of hazardous waste is overseen by Fire District No. 3.

E. PROGRAM OPERATION

The responsibility for program administration is delegated to the system operator/manager.

The system operator/manager will undertake, or will employ qualified persons to undertake the elements of the program described hereafter.

Wellhead Protection Program

F. ELEMENTS OF PROGRAM

The standard elements of a wellhead protection program are incorporated as follows:

1. Wellhead Protection Area

The wellhead protection areas are delineated using the "Calculated Fixed Radius" method set forth in the DOH "Ground Water Contamination Susceptibility Assessment Survey Forms", and attached herewith.

Because of the limited size of the delineation wellhead protection area initially calculated by the fixed radius method, and the predominant single family residential land use within and surrounding the area, a more detailed delineation (e.g., using the EPA analytical model GPTRAC to define the capture zone) was not scheduled for the foreseeable future. A more detailed delineation is planned only when the surrounding land use changes in a manner that would increase the potential risk of contamination.

2. Potential Sources of Contamination

The initial inventory of potential sources of ground water contamination in and around the delineated wellhead protection areas was made using the DOH "Ground Water Contamination Susceptibility Assessment Survey Forms", attached herewith. The "other" potential sources (Part V of the form) within the ten year time of travel were identified based on the lists included in the Washington State publication "Wellhead Protection Program", December 1993, Tables 2 and 3.

The WA Department of Health susceptibility rating for the wells is low for Synthetic Organic Compounds (SOC). The monitoring requirement for the 1993-1995 Compliance period was 1 quarter of Volatile Organic Chemicals (VOC) monitoring. No VOCs were detected at levels above the MCL in the first set of samples.

Wellhead Protection Program

3. Management Plan

The water utility does not have regulatory authority over land use. Such regulatory authority rest with the Island County aquifer protection program.

The inventory of potential sources of contamination indicates a relatively low risk for potential groundwater contamination. Therefore, the utility's management plan shall consist of:

- a) Notification of the Island County Health Department and/or Solid Waste Department of any potential sources of contamination in the "high risk" category, identified Washington State publication "Wellhead Protection Program", December 1993, Tables 2, except those activities related to residential land use.
- b) Public education, as described hereafter.
- c) Monitoring of water quality, to give a warning of ground water contamination.
- d) Survey of properties where restrictive covenants govern the sanitary control radius for the utility's wells, and enforcement of the covenants when necessary.
- e) Encourage voluntary water conservation, to reduce the radius of influence of the drawdown curve, and thus, to reduce the potential for drawing in contaminated ground water.

4. Contingency Plan

Both wells withdraw water from the same aquifer.

If an operating source becomes contaminated, the District will:

- a) if necessary, implement the Water Shortage Response Plan to reduce water demand;
- b) assess the impact of the contaminant on water quality; determine if water treatment will allow the continued use of the contaminated well, and if necessary;
- c) proceed with the acquisition of a replacement well, utilizing condemnation procedures if required.

Wellhead Protection Program

The aquifer in the area north of District has adequate recharge for additional sources of withdrawal to replace a well. If necessary, the District has the resources to obtain short-term financing for the level of expenditure needed to either install water treatment or replace a well.

5. Public Participation and Education

Because of the small size of the community supplied by the District, the opportunity for direct public involvement is provided through attendance at the regularly scheduled, open District meetings.

Public education will be divided into the following three tasks:

- a) Island County Cooperative Extension/Washington State University Beach Watchers Program

Utilize the existing public education program developed by the WSU Beach Watchers. This program combines the topics of prevention of contamination of stormwater and groundwater.

The program completed to date, and to be continued by the WSU Beach Watchers, includes the following:

- The development of an educational display that features photographs depicting different forms of pollutants. It gives solutions and alternatives to use of common household "hazardous" chemicals. The display was first used at the Penn Cove Water Festival in May, 1995. It will continue to be used at other public events.
- Because the display is too big for some places, a smaller table-top display was also developed. The smaller display has been set up at libraries, local banks, etc.
- Several brochures have been developed or were obtained for distribution at the above displays. These include:
 - ... Construction Best Management Practices
 - ... Stormwater Runoff Information

Wellhead Protection Program

- ... Informational Quiz (for schools)
- ... Business & Household Hazardous Waste (County's Solid Waste Program)

- A series of evening lectures by the WSU Beach Watcher's "Home-Asyst" program included presentations on watershed and wellhead protection, and hazardous waste disposal.

b) Distribution of General Information Brochures

Brochures pertaining to the prevention of groundwater contamination will be periodically included with utility bills. (see Attachment 'A')

c) Distribution of Notification Letters

All property owners in the wellhead protection area boundaries and all property owners in the Admiral's Cove subdivision will receive a letter notifying them of the presence of the wells and the need to prevent groundwater contamination. (see sample letter, Attachment 'B'). The Island County Health Department, and Fire District No. 3 will be notified at the same time.

6. Spill Response Plan

The District relies upon Fire District No. 3, and the Island County Solid Waste Department (hazardous material coordinator) to be the lead agencies in spill response. It is assumed that the qualifications of these agencies incident and spill response plans will be suitable for the protection of the District's wells.

E. REFERENCE MATERIAL

The following publications should be retained by the utility as references for its wellhead protection program:

- "Wellhead Protection Program", December 1993, Washington Department of Health

Wellhead Protection Program

- *"Protecting Local Ground-Water Supplies Through Wellhead Protection"*, May 1991, US Environmental Protection Agency (publication EPA 570/9-91-007)

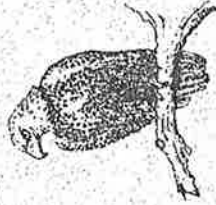
F. PROGRAM SCHEDULE

<u>Task</u>	<u>Scheduled Completion</u>
Public participation	ongoing
Susceptibility assessment	completed
Initial delineation of WHPA	completed
Refined delineation of WHPA	not scheduled until land use changes to create increased risk of contamination
Initial vulnerability assessment	completed
Detailed vulnerability assessment	completed
Education program development and notification letters	in progress
Monitoring	ongoing
Contingency plan	completed
Development of regulations	na
Spill response	completed

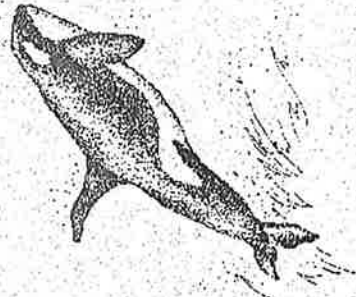
**PUGET SOUND
IS WORTH CARING
ABOUT**



**WHAT WASHES AWAY
DOES NOT GO AWAY**



**SAVING WATER IS AS
IMPORTANT
AS KEEPING IT CLEAN**



**WE ARE ALL
CITIZENS
OF A WATERSHED**

RESOURCES:

FOR CONSTRUCTION SITE EROSION:

- Island County Public Works, 679-7331
- Surface Water Department
- Town of Coupeville 678-4461
- Island County/WSU 679-7327
- Cooperative Extension
- Department of Ecology, (360) 407-6145
- Education & Public Information
- Puget Sound Action Team 1-800-54-SOUND

FOR NATIVE PLANTS:

- Island County/WSU Cooperative Extension: 679-7327
- Whidbey Soil & Water Conservation Dist. 678-4708

FOR HAZARDOUS WASTE:

- Island County/WSU Cooperative Extension 679-7327
- Island County/WSU Waste Warriors 679-7391
- Island County Solid Waste 678-3328

FOR YARD & GARDEN INFORMATION:

- Island County/WSU Cooperative Extension 679-7327
- Island County/WSU Master Gardeners 679-7327

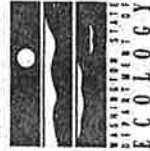
**Prepared by Island County/WSU
Beach Watchers**

For

**Town of Coupeville, WA
Integrated Stormwater Management Plan**

Funded by

**Town of Coupeville, WA
Washington Department of Ecology
Centennial Clean Water Fund**



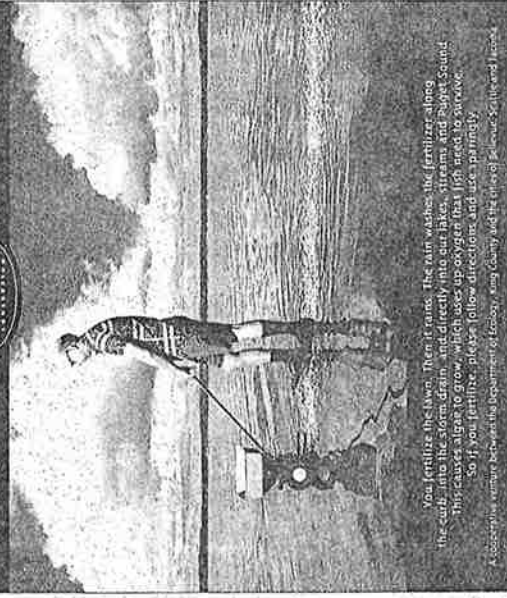
Printed on Recycled Paper with Soy Ink

**STORMWATER NOFF
INFORMATION**

WHEN YOU'RE FERTILIZING THE LAWN,

REMEMBER YOU'RE NOT JUST

FERTILIZING THE LAWN.



You fertilize the lawn. Then it rains. The rain washes the fertilizer along the curb into the storm drain, and directly into our lakes, streams, and Puget Sound. This causes algae to grow, which uses up oxygen that fish need to survive. So if you fertilize, please, follow directions and use sparingly.

A cooperative venture between the Department of Ecology, King County and the Office of Pollution Control and Hazardous Waste.

Reproduced with permission of the
Washington State Department of Ecology



TOWN OF COUPEVILLE

P.O. Box 725
Coupeville, WA 98239
678-4461

Scatchet Head Water District
7906 Guemes Avenue
Clinton, WA. 98236

PROTECTION OF DISTRICT WELLS

Dear Water District Customer,

The Scatchet Head Water District is required by the Washington Department of Health to develop a wellhead protection plan. Wellhead protection involves protecting the land area surrounding our wells in order to prevent contamination of our drinking water supply. The District's wells are located on a parcel at the intersection of Samish Court and George Drive. Part of the plan is this letter of notification to all potential sources of contamination to our wells. Most of District's residents live within the wellhead protection zones surrounding our well field and employ the use of septic systems to dispose of wastewater.

This letter is intended to inform you of the location of our wells and protection zones, and to serve as a reminder that any hazardous material put onto the ground or into your septic system has the potential of contaminating our drinking water supply. Some potentially harmful activities to avoid are:

- Improper use of a septic system (dumping paint, household cleaners, or solvents into your septic system).
- Dumping motor oil, gasoline, antifreeze or similar fluids onto the ground.
- Heavy use of fertilizers and pesticides.
- Dumping or burying garbage in the ground.

It should be the intent of all resident to keep and protect the quality of the water serving our community, for our continued good use, and for the ones that come along after us. Thank you for following these guidelines. If you have any questions about this matter, please feel free to contact me the District's Board of Commissioners.

TIPS TO AVOID SEPTIC SYSTEM TROUBLE:

- DO take leftover household chemicals to a hazardous waste collection center for disposal.
- DO practice water conservation. Repair dripping faucets and leaking toilets.
- DO learn the location of your septic system and drain field.
- DON'T allow anyone to drive or park over any part of the system. Areas should be left undisturbed with only a mowed grass cover. Roots from nearby trees or shrubs may clog and damage your drain lines.
- DON'T poison your system by pouring chemicals down the drain. They can kill the beneficial bacteria that treat your wastewater.

Your Cooperation is most appreciated.

APPENDIX K Cross-Connection Control Program

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SCATCHET HEAD WATER DISTRICT

Resolution No. 2020 – 2

CROSS CONNECTION CONTROL PROGRAM

A RESOLUTION of the Scatchet Head Water District, Island County, Washington to establish legal authority to approve, adopt, and implement an official Scatchet Head Water District Cross Connection Control (CCC) Program.

WHEREAS the Scatchet Head Water District has determined to formally adopt a CCC Policy to help prevent CCC contamination as required by the Washington State Department of Health;

WHEREAS the Scatchet Head Water District has the responsibility to protect the public water system from contamination in the distribution system (to end at the meter and/or connection to the water main) due to cross connections defined as “any actual or potential physical connection between a potable water line and any pipe, vessel, or machine that contains or has a probability of containing a non-potable gas or liquid to enter the potable water system by backflow”;

WHEREAS cross-connections within the customer’s plumbing system pose a potential source for the contamination of the Scatchet Head Water District;

WHEREAS the Scatchet Head Water District will have the authority to evaluate premises for cross connection hazards, eliminate and/or control any cross connections, inspect backflow preventers, respond to backflow incidents, require CCC customer questionnaire response, and mandate public education for consumers.

LET IT BE RESOLVED that the Scatchet Head Water District establishes the following service policy to protect the water system from the risk of contamination. For public health and safety, this policy shall apply equally to all new and existing connections to the water system.

FURTHER, LET IT BE RESOLVED, that the customer’s plumbing system, starting from the termination of the Scatchet Head Water District’s service pipe, shall be considered a potential high-health hazard requiring the isolation of the customer’s premises by a Washington State Department of Health approved, customer-installed and maintained reduced-pressure principle backflow assembly (RPBA) or reduced-pressure detector assembly (RPDA). The RPBA or RPDA shall be located at the end of the water system’s water service pipe (downstream of the meter).

NOW, THEREFORE, BE IT RESOLVED that, effective on the date of this resolution, that the Scatchet Head CCC Policy be officially approved and adopted.

Signed on: 2/13/2020

By: 
Commissioner Carr

By: 
Commissioner Guyette

By: _____
Commissioner Mullins

Cross Connection Control Program

A. REQUIREMENT FOR PROGRAM

The Washington Administrative Code (WAC 246-290-490) states that water purveyors [i.e., water utilities] have the responsibility to protect public water systems from contamination due to cross connections. A cross connection may be defined as *"Any actual or potential physical connection between a potable water line and any pipe, vessel, or machine that contains or has a probability of containing a non-potable fluid, such that it is possible for a non-potable fluid to enter the potable water system by backflow"*.

The Washington Administrative Code also states that the purveyor shall develop and implement a cross connection control program acceptable to the Washington Department of Health. The scope and complexity of the program shall be directly related to the size of the system and the potential public health risk. The most recently published edition of the manual titled *"Cross Connection Control, Accepted Procedure and Practice"*, published by the Pacific Northwest Section, American Water Works Association, shall be used as a resource to establish minimum cross connection control policies. However, the purveyors shall have the option of establishing more stringent requirements.

The purpose of the cross connection control program is to protect the health of water consumers and the potability of the public water system through:

- the inspection ⁽¹⁾ and regulation of plumbing in existing and proposed piping networks (by the Plumbing Inspector having jurisdiction); and
- the survey of the water use within premises (by the Purveyor) to assess the need for the installation of a backflow prevention assembly on the water service; and
- the proper installation and surveillance of backflow prevention assemblies installed on the water service (by the Customer) when actual or potential cross connections within the premises exist and cannot be eliminated or isolated to the Purveyor's satisfaction.

1

Please refer to the referenced Cross Connection Control Manual for the definition of "inspection" and "survey" used in the context of cross connection control.

Cross Connection Control Program

B. PROGRAM OBJECTIVES

The objective of the cross connection control program for the Scatchet Head Water District, hereinafter referred to as the Purveyor, are to:

- 1) reasonably reduces the risk of contamination of the public water distribution system,
- 2) reduce the Purveyor's exposure to legal liability arising from the backflow of any contaminant originating from the customer's plumbing system, and
- 3) to cooperate with local public health and plumbing inspection authorities in their responsibility to protect the customer from potential contamination through cross connections within the customer's property.

C. ELEMENTS OF PROGRAM

The standard elements of the cross connection program are incorporated as follows:

1. Enforcement Authority - The Purveyor by resolutions, shall establish the primary enforcement authority for the agency. [Resolution to be adopted in future]. The enforcement authority established by Resolution, and the Washington Administrative Code (WAC 246-290-490) shall be supplemented by service contract made with the customer. The service contract, a sample included in the publication "*Cross Connection Control, Accepted Procedure and Practice*", Sixth Edition, should be reviewed by the Purveyor's attorney.
2. Program Administration - The responsibility for program administration is delegated to the system operator/manager.
3. Survey Schedule - A schedule for the survey of existing facilities on a priority basis does not apply; all customers are single family residences. The survey of residential customers will be done as outlined in Section D, "Program Operation".
4. Plan Review - For plan review, all applications for service shall be submitted to the Manager. The Manager may require the submission of plumbing and site utility plans for the purpose of assessing the risk of cross connections within the customer's premises.

Cross Connection Control Program

5. Survey of New Construction - The survey of new construction for cross connections may be undertaken by the Manager and/or a cross connection control specialist or professional engineer, as outlined in Section D, "Program Operation". Alternatively, the customer may be required to employ a Purveyor approved cross connection control specialist (DOH certified) or professional engineer to conduct the survey and submit a report to the Purveyor.
6. Approved Backflow Assemblies - The Purveyor shall rely upon the Washington Department of Health's published list of "Approved" backflow prevention assemblies. This list shall be obtained from the State of Washington.
7. Records - The Purveyor's secretary shall maintain copies of all records, including but not limited to, correspondence, survey results, and backflow assembly test reports. The record form "Record of Backflow Prevention Assemblies" (Form B-1), included herewith, shall be used to record the location of all backflow prevention assemblies required by the Purveyor as a condition of obtaining and maintaining water service.
8. Testing of Assemblies - All assemblies listed on the form "Record of Backflow Prevention Assemblies" (Form B-1), shall be tested upon installation (before being approved by the Purveyor), annually thereafter, after relocation and after repair, by Washington Department of Health certified, backflow assembly testers (BAT).
9. List of Certified Testers - The list of local certified testers (BAT) approved by the Purveyor is included herewith. Other certified testers may be added to this list upon request.
10. Public Education - Provisions for the education of the customer about cross connections and the customer's responsibility to protect the water supply from contamination is outlined in Section E, "Public Education".

D. PROGRAM OPERATION

The Purveyor shall become involved in the survey of single family homes, and enforcement of more stringent requirements for cross connection control than specified under the plumbing code if:

- a) The Purveyor develops a significant history of operating problems, such as main breaks, that increases the probability of backsiphonage conditions.

Cross Connection Control Program

- b) The Purveyor has concern that a customer's plumbing system may have been installed without the approval of the plumbing inspector. This may include mobile homes.
- c) The customer has special plumbing that increases the public health risk, such as:
 - i) a lawn irrigation system
 - ii) a solar heating system
 - iii) an auxiliary source of supply, e.g., well
 - iv) piping for livestock watering, hobby farming, etc.
 - v) residential fire sprinkler system
 - vi) water treatment equipment, e.g., softener
 - vii) property containing a small boat moorage
- d) The customer's dwelling is a seasonal or transient recreational vehicle that could contain a waste holding tank.

For single family residential customers with special plumbing, and for all non-single family residential customers, the Purveyor shall be involved in the survey of the premises.

In addition to choosing to survey single family homes as described above, the Purveyor, at its discretion, may reduce the risk of the contamination of its distribution system by installing a check valve or dual check valve at the water meter to isolate each premises. These devices, commonly known as 'special application devices', are not used in place of a required 'approved' assembly. They are used for residential service isolation to provided an extra degree of protection from a low risk category of hazard.

A check valve placed on a water service can prevent thermal expansion. Serious damage could occur to a plumbing system if the pressure and high temperature caused by thermal expansion is not relieved. In particular, excessive water temperature and/or excessive water pressure in hot water heaters (tanks), if not relieved, could cause the hot water tank to explode. The customer's hot water tank, and connected plumbing system, would normally be protected by a temperature-pressure relief valve located at or near the top of the hot water heater. In addition, under the 1994 Uniform Plumbing Code, a thermal expansion tank would be installed.

Cross Connection Control Program

Before the Purveyor installs a check valve at the meter, the Purveyor shall give the customer written notice that:

- 1) For cross connection control and to facilitate meter maintenance, a single or dual meter check valve will be installed at every water meter.
- 2) It is the customer's responsibly to maintain his plumbing system in compliance with the current edition of the Uniform Plumbing Code. This may include, but is not limited to, the proper installation and maintenance of a temperature-pressure relief valve on the hot water tank, and an expansion tank.
- 3) By a date specified by the Purveyor for the installation of the check valve on the service, the customers should ensure that his plumbing system is properly protected with a temperature- pressure relief valve and expansion tank.

For the above notice requirement, also see the "Application for Water Service" referred to above.

The administrative authority established by the Purveyor in the form of a resolution is delegate to the following:

The system operator/manager shall perform the following related tasks:

- 1) Initial screening of all service applications. Determination of the need to refer an application for a single family residential service to the cross connection control specialist, e.g. where the residence contains a fire sprinkler system.
- 2) Issuing of all correspondence to the customer.
- 3) Oversight of the Purveyor's records pertaining to cross connection control.
- 4) Periodic review of customer activities that would indicate plumbing changes, e.g., installation of a lawn sprinkler system.
- 5) Initiation of all enforcement action, and emergency response to water system or premise contamination (including backflow incident investigation).

Cross Connection Control Program

- 6) Communication with the WA Department of Health, and local health authority.

A Washington Department of Health certified Cross Connection Control Specialist (CCCS), employed by contract, or the Purveyor's professional engineer, shall perform the following tasks for the Purveyor:

- 1) Review of all non-residential plans, initial survey and periodic re-survey of premises, and determination of the requirement for approved backflow prevention assemblies.
- 2) Recommendation of backflow assembly installation standards, list of approved backflow assemblies, and cross connection program language for adoption by the Purveyor.
- 3) Review of the results of the test reports submitted by certified backflow assembly testers (BAT)
- 4) Recommendation of standard cross connection control enforcement procedures, and record system.
- 5) Recommendation of material to be used for public education.
- 6) Assist the Directors in enforcement actions, and emergency response to system or premise contamination.

E. PUBLIC EDUCATION

The public education program for the Purveyor shall consist mainly of the distribution with water bills of information brochures describing the cross connection hazards in homes and the recommended devices that should be installed by the homeowner to reduce the hazard. The education program emphasizes the responsibility of the home owner in preventing the contamination of his/her water supply. The information brochures may be obtained from Pacific Northwest Section, American Water Works Association, P. O. Box 19581, Portland, Oregon, 97280 (telephone 503-246-5845).

Cross Connection Control Program

F. PROGRAM SCHEDULE

The following is the scheduled survey of premises:

1998-1999	Premises with a solar heating unit or a lawn irrigation system.
	Community pool and club house

To this date, the Purveyor has not required the installation of a backflow prevention assembly or air gap.

1) Community swimming pool

(a) RPBA on boiler feed line [1/2"φ Conbroco Model 4020302 serial no. C3150]

(b) AG on pool supply line

Annual notification for testing assemblies and inspecting required air gaps (when required) will be mailed by the Purveyor in the spring of each year. The results will be made available for review in the Purveyor's files.

On all new services, the Purveyor currently installs meter checks with its water meters.

RPBA / RPDA

Relief Valve [$\Delta P \geq 2.0$ psi]	Dripped at: _____ . _____ psi Opened (flow) at: _____ . _____ psi Failed to open _____ (check)
Check Valve # 2 [$\Delta P \geq 1.0$ psi]	Pressure drop: Valve leaked _____, Tight _____ (check)
Check Valve # 1 [$\Delta P \geq 1.0$ psi]	Pressure drop: Valve leaked _____, Tight _____ (check)
Check Valve # 1 Buffer [≥ 3.0 psi]	C V #1 ΔP - Relief ΔP = _____ . _____ psi
Relief Vent Size: _____ inches, Air Gap Dist.: _____ inches	
Meter moved when main line Test Cock # 4 opened: yes __, no __ Detector Meter Reading: _____	

DCVA/ DCDA

Check Valve # 1 [$\Delta P \geq 1.0$ psi]	Pressure drop: Valve leaked _____, Tight _____ (check)
Check Valve # 2 [$\Delta P \geq 1.0$ psi]	Pressure drop: Valve leaked _____, Tight _____ (check)
Meter moved when main line Test Cock # 4 opened: yes __, no __ Detector Meter Reading: _____	

PVBA/ SVBA

Check Valve # 1 [$\Delta P \geq 1.0$ psi]	Pressure drop: Valve leaked _____, Tight _____ (check)
Air Inlet [$\Delta P \geq 1.0$ psi]	Opened at: Failed to open _____ (check) . _____ psi

This certifies that the above test results accurately reflect the performance of the assembly and/or condition of the air gap at the time of the test.

Signature of Tester

BAT Certif. No.

Date

This certifies receipt of this completed test report and its submittal to the Scatchet Head Water District.

Signature of the Customer or authorized agent

Date

Backflow Assembly Test / AG Inspection Report

FILE RECORD

DISTRICT ASSIGNED INVENTORY NUMBER: _____

Name of Premise:	
Premise Address:	
Location of Assembly:	
Type of Hazard Isolated:	
Assembly Size: (inches)	Assembly Type:
Make:	Model:
Serial No.:	Date Installed:

Date Test Notice Issued	Date of Test Report	Name of Certified Tester (BAT)	WA DOH BAT Certif. Number	Results Satisf. Y/N	Repairs Made Y/N

Attach all *Backflow Assembly Test / AG Inspection Report* forms.

COMMENTS/NOTES: _____

SAMPLE
Cross Connection Control Policy

FINDING OF FACT:

Whereas it is the responsibility of a water purveyor to provide water to the customer that meet State water quality standards;

Whereas it is the water purveyor's responsibility to prevent the contamination of the public water supply system;

Whereas, it is a requirement of the Washington Department of Health for the purveyor to establish a cross connection control program satisfactory to the Department of Health, and

Whereas cross connections within the customer's plumbing system pose a potential source for the contamination of the public water supply system;

Now be it resolved that the _____ {water utility}, hereinafter referred to as the Purveyor, establishes the following service policy to protect the Purveyor owned water supply system from the risk of contamination. For public health and safety, this policy shall apply equally to all new and existing customers.

PREVENTION OF CONTAMINATION:

The customer's plumbing system, starting from the termination of the Purveyor's water service pipe, shall be considered a potential high health hazard requiring the isolation of the customer's premises by a Purveyor approved, customer installed and maintained air gap. The air gap shall be located at the end of the Purveyor's water service pipe. Water shall only be supplied to the customer through this Purveyor approved air gap.

Notwithstanding the aforesaid, the Purveyor, upon assessing the risk of contamination posed by the customer's plumbing system and use of water, may allow the customer to connect directly to the water service pipe, i.e., without a Purveyor approved air gap. Permission for the direct connection to the water service will be at the sole discretion of the Purveyor, and will be based on the following terms and limitations:

- 1) The customer agrees to take all measures necessary to prevent the contamination of the plumbing system within his/her premises and the Purveyor's distribution system that may occur from backflow through a cross connection. These measure shall include the prevention of backflow under any back pressure or backsiphonage condition, including the disruption of supply

Cross Connection Control Policy

from the Purveyor's system that may occur by reason of routine system maintenance or during emergency conditions, such as a water main break.

- 2) The customer agrees to install, operate and maintain at all times his/her plumbing system in compliance with the current edition of the Plumbing Code having jurisdiction as it pertains to the prevention of contamination, and protection from thermal expansion due to a closed system that could occur with the present or future installation of backflow preventers on the customer's service and/or at plumbing fixtures.
- 3) For cross connection control or other public health related survey, the customer agrees to provide free access for the employees of the Purveyor to all parts of the premises during reasonable working hours of the day for routine surveys, and at all times during emergencies.
- 4) The customer agrees to install all backflow prevention assemblies requested by the Purveyor, and to maintain those assemblies in good working order. The assemblies shall be of a type, size and make approved by the Purveyor and the Washington Department of Health. The assemblies shall be installed in accordance with the recommendations given in the "*Cross Connection Control Manual, Accepted Procedures and Practice*", Sixth Edition, December 1995 published by the Pacific Northwest Section, American Water Works Association, or latest edition thereof.
- 5) The customer agrees to have all backflow prevention assemblies tested upon installation, annually thereafter or when requested by the Purveyor, after repair and after relocation. All testing shall be done by a Purveyor approved and State Department of Health certified Backflow Assembly Tester (BAT). The test procedure shall comply with those recommended in the "*Cross Connection Control Manual, Accepted Procedures and Practice*", Sixth Edition, December 1995, or latest edition thereof. The results of the tests shall be reported within 30 days by the customer to the Purveyor on a form provided by or approved by the Purveyor.
- 6) At the time of application for service, if required by the Purveyor, the customer agrees to submit plumbing plans and/or a cross connection control survey of the premises by a Purveyor approved and Washington Department of Health certified Cross Connection Control Specialist (CCCS), or by a Purveyor approved Professional Engineer.

Cross Connection Control Policy

The survey shall assess the cross connection hazards and list the backflow prevention provided within the premises. The results of the survey shall be submitted prior to the Purveyor turning on water service to a new customer. The cost of the survey shall be borne by the customer.

- 7) For classes of customers other than single family residential, when required by the Purveyor, the customer agrees to submit a cross connection control re-survey of the premises by the persons described above. The Purveyor may require the re-survey to be performed in response to changes in customer's plumbing, or performed periodically (annual or less frequent) where the Purveyor considers the customer's plumbing system to be complex or subject to frequent changes in water use. The cost of the re-survey shall be borne by the customer.
- 8) The customer agrees to obtain the prior approval from the Purveyor for all changes in water use, and alterations and additions to the plumbing system, and shall comply with any additional requirements imposed by the Purveyor for cross connection control.
- 9) The customer agrees to immediately notify the Purveyor and the local public health inspection jurisdiction of any backflow incident occurring within the premises, (i.e., entry into the potable water of any contaminant or pollutant) and shall cooperate fully with the Purveyor to determine the reason for the incident.
- 11) The customer acknowledges the right of the Purveyor to discontinue water supply within 72 hours of giving notice, or a lesser period of time if required to protect the public health, if the customer fails to cooperate with the Purveyor in the survey of premises, in the installation, maintenance, repair, inspection or testing of backflow prevention assemblies or air gaps required by the Purveyor, or in the Purveyor's effort to contain a contaminant or pollutant that is detected in the customer's system.

Without limiting the generality of the foregoing, in lieu of discontinuing water service the Purveyor may install a reduced pressure backflow assembly on its service pipe to provide premises isolation, and recover all of its costs for the installation and subsequent maintenance and repair of the assembly, appurtenances and enclosure from the customer as fees and charges for water. The failure of the customer to pay these fees and charges may result in termination of service in accordance with the Purveyor's water billing policies.

Cross Connection Control Policy

- 12) The Purveyor shall require premises isolation for a customer that falls within any category for "Mandatory Premises Isolation" established by the Washington Department of Health regulations.
- 13) Where the Purveyor imposes mandatory premises isolation in compliance with Washington Department of Health regulations, or agrees to the customer's voluntary premises isolation through the installation of a reduced pressure backflow assembly immediately downstream of the Purveyor's water meter, the customer acknowledges his/her obligation to comply with the other cross connection control regulations having jurisdictions (e.g., plumbing code). Although the Purveyor's requirements for installation, testing and repair of backflow assemblies may be limited to the reduced pressure backflow assemblies used for premises isolation, the customer agrees to the other terms herein as a condition of allowing a direct connection to the Purveyor's service pipe (i.e., without an air gap).
- 14) The customer agrees to indemnify and hold harmless the Purveyor for all contamination of the customer's plumbing system or the Purveyor's distribution system that results from an unprotected or inadequately protected cross connection within his/her premises. This indemnification shall pertain to all backflow conditions that may arise from the Purveyor's suspension of water supply or reduction of water pressure, recognizing that the air gap separation otherwise required would require the customer to provide adequate facilities to collect, store and pump water for his/her premises.
- 15) The customer agrees that, in the event legal action is required and commenced between the Purveyor and the customer to enforce the terms and conditions herein, the substantially prevailing party shall be entitled to reimbursement of all its costs and expenses including but not limited to reasonable attorney's fees as determined by the Court.
- 16) The customer acknowledges that the Purveyor's survey of a customer's premises is for the sole purpose of establishing the Purveyor's minimum requirements for the protection of the public water supply system, commensurate with the Purveyor's assessment of the degree of hazard.

Cross Connection Control Policy

It shall not be assumed by the customer or other regulatory agencies that the Purveyor's survey, requirements for the installation of backflow prevention assemblies, lack of requirements for the installation of backflow prevention assemblies, or other actions by Purveyor personnel constitutes an approval of the customer's plumbing system, or an assurance to the customer of the absence of cross connections therein.

- 17) The customer acknowledges the right of the Purveyor, in keeping with changes to State regulations, industry standards, or the Purveyor's risk management policies, to impose retroactive requirements for additional cross connection control measures.

The Purveyor shall record the customer's agreement to the above terms for service on an "Application for Water Service", "Application for Change of Water Service" or other such form prepared by the Purveyor and signed by the customer.

The Purveyor shall establish the priority for the survey and re-survey of new and existing premises for cross connections, based on the risk management policies established by the Purveyor, and the minimum requirements imposed by the Washington Department of Health.

The Purveyor's cross connection control program shall be carried out in coordination with the local plumbing or building authorities having jurisdiction.

The definition of technical terms given in the "*Cross Connection Control Manual, Accepted Procedures and Practice*", Sixth Edition, December 1995 published by the Pacific Northwest Section, American Water Works Association, or latest edition thereof, shall apply herein.

SAMPLE
Application for Water Service

OWNER'S NAME: _____

MAILING ADDRESS: _____

LOCATION ADDRESS: _____

The undersigned applicant hereby applies for a water connection to the above described property. The applicant is the owner of the described property or the authorized agent of the owner. By signing this application, the property owner agrees, as a condition of the _____ {utility's name}, hereinafter referred to as the Purveyor, providing and continuing service to the above describe property, to comply with all provisions of the attached current Ordinance, Resolution and/or By-laws of the Purveyor, or latest revision thereof, and other such attached rules and regulations now existing or which may be established from time to time governing the Purveyor's water system. The property owner specifically agrees:

a) to install and maintain at all times his/her plumbing system in compliance with the most current edition of the Island County Plumbing Code as it pertains to the prevention of potable water system contamination, prevention of pressure surges and thermal expansion in his/her water piping (for thermal expansion, it shall be assumed that a check valve is installed by the Purveyor on the water service pipe);

b) as the condition of the Purveyor waiving the requirement for premises isolation by the property owner of a reduced pressure backflow assembly on his/her service pipe, to authorize the Purveyor's to make periodical water use surveys of the premises; within 30 days of the Purveyor's request, to install, test, maintain, and repair in accordance with the Purveyor's cross connection control standards (copy received with this application) all in-premises backflow prevention assemblies required by the Purveyor to provide equivalent protection for the Purveyor's distribution system; and to report to the Purveyor within 30 days of obtaining the results of all tests and repairs to aforementioned backflow prevention assemblies, and of making any change to the plumbing system.

c) not to make a claim against the Purveyor or its agents or employees for damages and/or loss of production, sales or service, in case of water pressure variations, or the disruption of the water supply for water system repair, routine maintenance, power outages, and other conditions normally expected in the operation of a water system.

d) to pay his/her water billing within thirty (30) days from the date of billing.

After thirty (30) days of the Purveyor mailing a written notice to the property owner of his/her breach of this agreement, the Purveyor may terminate water service. In the event legal action is required and commenced between the parties to this agreement to enforce the terms and conditions herein, the substantially prevailing party shall be entitled to reimbursement of all its costs and expenses including but not limited to reasonable attorney's fees as determined by the Court.

Applicant's Signature_____
Date

SAMPLE

Revised Application for Water Service

OWNER'S NAME: _____

MAILING ADDRESS: _____

LOCATION ADDRESS: _____

The undersigned applicant hereby applies for a change to the Application for Water Service to the above described property. The applicant is the new owner of the described property or the authorized agent of the new owner. By signing this application, the property owner agrees, as a condition of the _____ {utility's name}, hereinafter referred to as the Purveyor, providing and continuing service to the above describe property, to comply with all provisions of the attached current Ordinance, Resolution and/or By-laws of the Purveyor, or latest revision thereof, and other such attached rules and regulations now existing or which may be established from time to time governing the Purveyor's water system. The property owner specifically agrees:

a) to install and maintain at all times his/her plumbing system in compliance with the most current edition of the Island County Plumbing Code as it pertains to the prevention of potable water system contamination, prevention of pressure surges and thermal expansion in his/her water piping (for thermal expansion, it shall be assumed that a check valve is installed by the Purveyor on the water service pipe);

b) as the condition of the Purveyor waiving the requirement for premises isolation by the property owner of a reduced pressure backflow assembly on his/her service pipe, to authorize the Purveyor's to make periodical water use surveys of the premises; within 30 days of the Purveyor's request, to install, test, maintain, and repair in accordance with the Purveyor's cross connection control standards (copy received with this application) all in-premises backflow prevention assemblies required by the Purveyor to provide equivalent protection for the Purveyor's distribution system; and to report to the Purveyor within 30 days of obtaining the results of all tests and repairs to aforementioned backflow prevention assemblies, and of making any change to the plumbing system.

c) not to make a claim against the Purveyor or its agents or employees for damages and/or loss of production, sales or service, in case of water pressure variations, or the disruption of the water supply for water system repair, routine maintenance, power outages, and other conditions normally expected in the operation of a water system.

d) to pay his/her water billing within thirty (30) days from the date of billing.

After thirty (30) days of the Purveyor mailing a written notice to the property owner of his/her breach of this agreement, the Purveyor may terminate water service. In the event legal action is required and commenced between the parties to this agreement to enforce the terms and conditions herein, the substantially prevailing party shall be entitled to reimbursement of all its costs and expenses including but not limited to reasonable attorney's fees as determined by the Court.

Applicant's Signature

Date

APPENDIX L System Capacity Calculations

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WORKSHEET 6-1: ERU Determinations

Water System Physical Capacity Documentation based on MDD

Note: Capacity determinations are only for existing facilities that are operational for the water system.

**Specific Single-Family Residential Connection Criteria (measured or estimated demands)
(see Chapter 5):**

Average Day Demand (ADD): 200 gpd/ERU

Maximum Day Demand (MDD) 425 gpd/ERU

Water System Service Connections correlated to ERUs			
Service Classification	Total MDD for the classification, gpd	Total # Connections in the classification	ERUs
Residential			
Single-family		410	410
Multifamily			
Nonresidential			
Industrial			
Commercial			
Governmental			
Agricultural			
Recreational			
Other (specify)			
DSL		N/A	
Other (identify)			
Total existing ERUs (Residential + Nonresidential + Non-revenue + Other) =			410

Physical Capacity as ERUs	
Water System Component (Facility)	Calculated Capacity in ERUs for each component
Source(s)	Vd & MDD: 672
Treatment	751
Equalizing Storage	965
Standby Storage	1,006
Distribution	597
Transmission	N/A
Other (specify)	N/A
Water System Physical Capacity (ERUs) = 597 (based on the limiting water system component shown above)	

Note: If multiple-day storage is needed to meet MDD, another approach to estimate the ERU capacity is necessary.

AVERAGE DAY DEMAND (ADD) CALCULATION

Date Printed: 2/1/2018

System: Scatchet Head Water District
ID No.: 76470 X
Location: Whidbey Island, Island County

Summer ADD is based upon June - September readings

Year	Total Water Usage Gallons	# of Active Connections	Yearly ADD gpd/ERU	Summer ADD gpd/ERU	Total Usage (ac-ft/yr)
2011	15,712,712	410	105	129	48
2012	15,094,191	410	101	118	46
2013	16,076,465	410	107	130	49
2014	16,437,749	410	110	138	50
2015	18,055,748	410	121	156	55
2016	18,976,236	410	127	153	58
2017	14,300,264	410	96	191	44
Average	17,110,749	410	114	167	53
Minimum	14,300,264	410	96	153	44
Maximum	18,976,236	410	127	191	58

ADD based upon maximum Summer ADD (3 years)	=	191	gpd/ERU
Design ADD	=	200	gpd/ERU

MAXIMUM DAY DEMAND (MDD) CALCULATION

Date Printed: 2/1/2018

System: Scatchet Head Water District
ID No.: 76470 X
Location: Whidbey Island, Island County

From DOH Water System Design Manual (Section 5.2.1)

Equation 5-2

$$MDD = (1.7)(MADD)$$

Where:

MDD = Maximum Day Demand (gallons/day/ERU)
MADD = Maximum Monthly Average Day Demand (gallons/day/ERU)

Year	MADD	MDD
2011	150	254
2012	139	237
2013	163	277
2014	169	287
2015	182	309
2016	181	307
2017	223	380
Average	195	332
Minimum	181	307
Maximum	223	380
Proposed	250	425

PEAK HOUR DEMAND (PHD) CALCULATION

System: Scatchet Head Water District
ID No.: 76470 X
Location: Whidbey Island, Island County

From DOH Water System Design Manual (Section 5.2.4)

Equation 5-1:
$$\text{PHD} = (\text{MDD}/1440)[(\text{C})(\text{N}) + \text{F}] + 18$$

Where:

PHD	=	<i>Peak Hourly Demand, (gallons per minute, gpm)</i>
C	=	<i>Coefficient Associated with Ranges of ERUs</i>
N	=	<i>Number of Service Connections, ERUs</i>
F	=	<i>Factor Associated with Ranges of ERUs</i>
MDD	=	<i>Maximum Day Demand, (gpd/ERU)</i>

Range of N (ERUs)		C	F
15	50	3.0	0
51	100	2.5	25
101	250	2.0	75
251	500	1.8	125
501	1,000,000	1.6	225

This is Table 5-1 in DOH Design Manual

Year	N (ERUs)	MDD (gpd/ERU)	C	F	PHD (gpm)
2011	410	254	1.8	125	170
2012	410	237	1.8	125	160
2013	410	277	1.8	125	184
2014	410	287	1.8	125	190
2015	410	309	1.8	125	203
2016	410	307	1.8	125	202
2017	410	380	1.8	125	246
Current	410	425	1.8	125	273
Approved	451	425	1.8	125	294
Proposed	597	425	1.6	225	366

SYSTEM CAPACITY

System: Scatchet Head Water District
ID No.: 76470 X
Location: Whidbey Island, Island County

WATER RIGHT CALCULATIONS

Based on Annual Volume & Average Day Demand (Eqn 6-3):

$N = Va / (365 \cdot ADD)$
 Where:

N = Number of Service Connections, ERUs
 Va = Annual Volume of Water Available from Water Right (gallons/year)
 ADD = Average Daily Demand per ERU (gpd/ERU)

	Va (acre-ft/year)	Va (gal/year)	ADD (gpd/ERU)	N (ERUs)
Potential Connections	241	78,655,072	200	1,077

Based on Instantaneous Flow & Maximum Day Demand (Eqn 6-4):

$N = Vd / MDD = (Q_i \cdot td) / MDD$
 Where:

N = Number of Service Connections, ERUs
 Vd = Total Volume of Water Available for Maximum Day's Demand (gpd)
 MDD = Maximum Daily Demand per ERU (gpd/ERU)
 Q_i = Instantaneous Maximum Water Right Flow Rate (gpm)
 td = Time that source operates per day (minutes/day)

	Q _i (gpm)	td (min/day)	MDD (gpd/ERU)	N (ERUs)	Minutes Pumped/Hr
S02	125	1329	425	391	55
S03	90	1329	425	281	55
Potential Connections	215	1329	425	672	55

SOURCE CALCULATIONS

Based on Well Production & Max Day Demand:

$N = Vd / ADD = (Q_s \cdot td) / ADD$
 Where:

N = Number of Service Connections, ERUs
 Vd = Total Volume of Water Available for Average Day's Demand (gpd)
 MDD = Max Daily Demand per ERU (gpd/ERU)
 Q_s = Total Well Production Flow rate (gpm)
 td = Time that source operates per day (minutes/day)

	Q _s (gpm)	td (min/day)	MDD (gpd/ERU)	N (ERUs)	Minutes Pumped/Hr
S02	125	1329	425	391	55
S03	66	1329	425	206	55
Potential Connections	191	1329	425	597	55

BOOSTER PUMP CALCULATIONS

Based on Well Production & max Day Demand:

$N = [1440(\text{PHD} - 18) / \text{MDD} \cdot F] / C$
 Where:

N = Number of Service Connections, ERUs
 PHD = Peak Hour Demand (gallons/minute) (Booster Pump Capacity)
 MDD = Maximum Daily Demand per ERU (gpd/ERU)
 F = PHD Coefficient from Table 5-1 (= 225)
 C = PHD Coefficient from Table 5-1 (= 1.6)

	Q _b (gpm)	C	F	MDD (gpd/ERU)	N (ERUs)
Potential Connections	540	1.6	225	425	965

TREATMENT CALCULATIONS

Based on Instantaneous Flow & Maximum Day Demand:

$N = Vd / MDD = (\sum Q_i \cdot td) / MDD$
 Where:

N = Number of Service Connections, ERUs
 Vd = Total Volume of Water Available for Maximum Day's Demand (gallons/day)
 MDD = Maximum Daily Demand per ERU (gpd/ERU)
 Q_t = Treatment System Maximum Design Flow Rate (gpm)
 td = Time that source operates per day (minutes/day)

	Q _t (gpm)	Minutes Pumped/Hr	td (min/day)	MDD (gpd/ERU)	N (ERUs)
not applicable	240	55	1329	425	751

Limiting Factors

Condition	Limiting Factor	ERUs
Water Right	Va & ADD	1,077
	Q _i & MDD	672
Source	Q _s & MDD	597
Booster Pump	Q _b & MDD	965
Treatment	Q _t & MDD	751

System Capacity (#ERUs): 597
 Condition: Source
 Limiting Factor: Q_s & MDD

Main Reservoir Water System Storage Capacity Calculations

System: Scatchet Head Water District
 ID No.: 76470 X
 Location: Whidbey Island, Island County

Equations/Calc's in this spreadsheet are in accordance with the DOH's Group A Public Water System Design Manual

Source

Wells	Pump Rate (gpm)	Comment
S01	125	water right limited to 30 gpm
emergency	66	
	0	
Qs:	191	Total minus emergency
Qs:	215	water right limited
Q's:	66	Total minus largest

Water right limit source capacity to 215 gpm.

of Connections

Year	ERUs (N)	DOH Approved
2017	410	451
Proposed	597	

Reservoir Specifications

Reservoir	ID	Vol (gal)	Vol (cf)	Height (ft)	Base EI	Top WS	Total Vol.	Vol/VF
Guemes Ave	24.0	287,629	38,453	85.00	360.00	445.00	287,629	3,384
Maple Pt Dr	14.6	119,000	15,909	95.00	350.00	445.00	119,000	1,253
Total:							287,629	3,384

Top Dead Storage (DS)

Top WS	Dead Storage Depth (ft)	Top Dead Vol (gal)	Top Dead Vol (res. vf)
445.0	0.5	1,692	0.5

Note: Assumed top Dead Storage is 6".

Operational Storage (OS)

Top WS	Operational Depth (ft)	Oper. Level	Oper. Vol. (gal)	Oper. Vol (res. vf)
444.50	1.00	443.50	3,384	1.0

Based upon assumed probe settings.

Required Equalizing Storage (ES)

PHD (gpm)	Qs (gpm)	PHD-Qs (gpm)	Ves (gal)	Ves (res. vf.)
366	191	175	26,298	7.8

Ves=(PHD-Qs)*150 or Zero

Recommended Standby Storage (SB)

ADD (gpd/ERU)	N	Qs (gpm)	QL (gpm)	tm (min)	Single Source			Greater of SB or FF
					SB (gal) Single Source	SB per ERU (gal/ERU)	SB (res. vf.)	
200	597	191	125	1,329	151,086	253	44.6	SB

Vsb (Single Source) = (2 days)(ADD)(N) or (200)(N) whichever is greater

Standby Storage (SB) Provided

gallons/ERU	# Conn's	Vsb 2	Vsb (res. vf.)
426	597	254,563	75.2

Fire Suppression Storage (FSS)

FF (gpm)	tm (minutes)	Vfss (gal)	Vfss (res. vf)
500	30	15,000	4.4

Vfss=FF*tm

Where: $FSS = (FF)(t_m)$
 $FF =$ Required fire flow rate (gpm)
 $t_m =$ Duration of FF rate (minutes)

Bottom Dead Storage (DS)

Res. Bot. Elev.	Top of Dead Storage	Dead Vol (gal)	Dead Vol (res. vf)
350.0	350.5	1,692	0.5

Note: Assumed Dead Storage is bottom 6" of reservoir

Available Storage Summary - Nested FF & Standby Storage

Storage Component	Vol (gal)	Res VF	Top WS	Bot WS	PSI Req/mt	Highest Grav. Service Elev.
Top Dead Storage	1,692	0.5	445.0	444.5		
Operational Storage (OS)	3,384	1.0	444.5	443.5		
Equalizing Storage (ES)	26,298	7.8	443.5	435.7	30	366.4
Standby Storage (SB)	254,563	75.2	435.7	364.9	20	318.7
Fire Suppression Storage (FSS)	15,000	4.4	364.9	360.5	20	314.3
Dead Storage (DS)	1,692	0.5	360.5	360.0		
Totals:	287,629	85.0				

APPENDIX M Hydraulic Modeling

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Scatchet Head Water District - 2019 Water System Plan

Hydraulic Model Properties

Title
 Engineer
 Company
 Date 2/13/2019
 Notes

Junction Table - Time: 0.00 hours

ID	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
32	150.00	0	295.89	63
38	135.00	6	295.66	70
43	155.00	14	297.09	61
45	200.00	5	345.64	63
48	160.00	0	298.56	60
54	345.00	14	472.84	55
55	346.00	8	472.31	55
64	175.00	8	295.23	52
67	100.00	12	295.73	85
70	170.50	0	304.71	58
74	370.00	10	473.83	45
77	195.00	0	322.15	55
78	195.00	0	320.31	54
82	187.50	0	315.56	55
91	345.00	0	448.62	45
96	350.00	0	448.62	43
100	355.00	3	448.67	41
102	375.00	0	474.64	43
112	350.00	8	448.72	43
123	150.00	9	344.05	84
127	250.00	7	344.81	41
129	195.00	0	447.86	109
130	195.00	0	447.88	109
138	196.00	0	447.85	109
139	196.00	0	447.85	109
146	175.00	0	345.69	74
147	175.00	0	345.69	74
150	270.00	4	447.79	77
152	278.00	0	447.84	73
155	196.00	0	447.85	109
161	335.00	0	448.71	49
168	187.00	7	322.08	58
171	300.00	0	448.03	64
176	316.00	0	448.16	57
180	180.00	7	322.07	61
182	247.00	0	447.79	87
193	350.00	6	448.63	43
197	289.00	0	447.94	69
199	209.50	6	447.79	103

Scatchet Head Water District - 2019 Water System Plan
Junction Table - Time: 0.00 hours

ID	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
201	340.00	0	448.36	47
202	337.00	0	448.33	48
204	25.00	0	151.34	55
205	25.00	7	151.26	55
207	332.00	0	448.79	51
212	309.00	0	448.10	60
220	25.00	24	150.41	54
224	0.00	7	150.82	65
227	180.00	5	345.68	72
230	23.00	0	151.67	56
231	25.00	0	152.16	55
238	225.00	0	449.18	97
248	194.00	0	322.13	55
259	225.00	0	345.81	52
262	25.00	0	152.14	55
265	348.00	0	448.58	44
271	214.00	0	448.77	102
275	348.00	0	448.58	44
280	25.00	0	151.97	55
281	25.00	0	151.69	55
283	325.00	8	448.95	54
286	15.00	16	148.20	58
288	345.00	21	448.54	45
291	25.00	0	152.07	55
292	25.00	0	152.02	55
304	370.50	0	480.71	48
305	370.00	11	480.50	48
307	225.00	0	465.46	104
308	225.00	0	449.20	97
313	325.00	0	449.19	54
320	275.00	0	465.69	83
328	220.00	0	449.34	99
330	215.00	6	449.43	101
331	215.00	0	449.41	101
336	345.50	0	451.37	46
337	345.00	10	451.37	46
339	360.00	12	472.46	49
340	360.50	0	472.55	48
342	370.00	0	479.69	47
343	370.00	0	479.56	47
348	364.50	6	473.54	47
349	365.00	6	473.65	47
351	350.00	0	451.38	44
352	349.50	0	451.38	44
354	350.00	7	451.07	44
356	346.50	5	451.51	45

Scatchet Head Water District - 2019 Water System Plan
Junction Table - Time: 0.00 hours

ID	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
359	325.00	0	472.80	64
360	325.00	8	472.80	64
362	215.00	0	449.42	101
366	360.00	0	451.07	39
367	360.00	8	451.07	39
371	225.00	0	449.23	97
375	302.00	0	450.35	64
377	345.00	0	479.63	58
380	355.00	0	467.13	49
386	350.00	19	479.77	56
388	370.00	0	479.56	47
390	351.00	0	480.08	56
392	275.00	8	465.70	83
394	360.50	0	474.09	49
395	360.00	0	474.13	49
397	358.00	0	478.16	52
399	346.00	7	465.91	52
400	345.00	0	466.37	53
402	350.00	0	451.41	44
403	350.00	0	451.41	44
405	360.00	12	477.59	51
408	348.00	0	451.70	45
410	352.00	6	466.69	50
412	369.00	0	473.97	45
413	371.00	0	474.21	45
416	360.00	0	473.94	49
418	365.00	0	474.16	47
419	365.00	0	474.21	47
422	330.00	0	466.15	59
424	346.00	0	464.53	51
433	347.00	0	479.73	57
442	370.00	0	479.95	48
444	370.00	6	476.84	46
445	368.00	0	476.41	47
448	337.50	0	466.25	56
450	345.00	13	479.65	58
457	360.50	0	482.92	53
458	362.00	0	483.40	53
462	345.00	0	472.81	55
463	345.00	0	472.83	55
465	357.00	0	471.66	50
466	360.00	0	472.88	49
470	364.50	0	473.70	47
472	345.00	10	479.70	58
474	370.50	0	475.51	45
475	368.50	0	475.88	46

Scatchet Head Water District - 2019 Water System Plan
Junction Table - Time: 0.00 hours

ID	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
479	335.00	7	449.16	49
481	370.00	0	479.73	47
485	368.00	0	479.57	48
487	347.50	0	451.37	45
494	350.00	0	451.92	44
497	365.00	0	473.78	47
499	365.00	0	474.07	47
501	304.00	0	465.93	70
502	298.50	0	465.90	72
504	350.00	0	472.80	53
505	351.00	0	472.76	53
507	366.00	8	476.38	48
510	349.00	0	473.19	54
511	350.00	0	473.29	53
513	353.00	0	451.07	42
514	355.00	0	451.07	42
516	327.00	0	448.99	53
523	352.00	6	469.56	51
525	357.50	0	482.00	54
528	237.00	0	465.51	99
535	364.00	0	475.47	48
538	358.00	0	470.20	49
539	357.00	0	469.52	49
541	350.00	0	450.88	44
543	375.00	0	486.27	48
546	220.00	0	449.35	99
548	277.00	0	465.75	82
550	360.00	0	477.60	51
552	225.00	0	465.44	104
558	315.50	0	466.01	65
561	288.50	0	465.83	77
568	215.00	0	465.38	108
570	55.00	0	464.90	177
572	204.00	0	465.32	113
576	346.00	0	449.74	45
582	130.00	0	465.07	145
587	365.00	15	476.55	48
591	355.00	13	473.72	51
596	350.00	14	452.36	44
598	170.00	0	465.15	128
605	367.00	0	476.67	47
608	350.00	0	453.48	45
624	350.00	0	450.13	43
627	350.00	0	450.45	43
629	350.00	0	451.89	44
649	360.00	0	440.65	35

Scatchet Head Water District - 2019 Water System Plan
Junction Table - Time: 0.00 hours

ID	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
650	360.00	0	440.69	35
651	360.00	0	440.82	35
652	360.00	0	441.10	35
653	360.00	0	494.75	58
654	360.00	0	494.71	58
655	360.00	0	494.58	58
656	360.00	0	494.30	58
696	200.00	0	521.50	139

Pipe Table - Time: 0.00 hours

ID	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
53	300	J-16	J-17	2.0	PVC	140.0	8	0.82
65	42	J-9	J-12	2.0	PVC	140.0	-40	4.08
76	52	J-29	J-30	2.0	PVC	140.0	40	4.08
101	251	J-43	J-27	2.0	PVC	140.0	10	1.02
125	309	J-25	J-32	2.0	PVC	140.0	-40	4.08
128	5	J-53	J-54	4.0	PVC	140.0	-62	1.59
137	18	J-58	J-59	4.0	Asbestos Cement	120.0	-8	0.21
145	24	J-63	J-64	4.0	PVC	140.0	-5	0.13
154	33	J-69	J-58	4.0	Asbestos Cement	120.0	-8	0.21
192	46	J-40	J-91	4.0	PVC	140.0	-16	0.42
200	48	J-95	J-96	4.0	PVC	140.0	28	0.71
203	58	J-97	J-98	4.0	Asbestos Cement	120.0	38	0.97
229	76	J-113	J-114	2.0	PVC	140.0	-16	1.63
247	95	J-29	J-122	4.0	PVC	140.0	14	0.36
257	119	J-102	J-79	4.0	PVC	140.0	28	0.71
260	127	J-66	J-85	4.0	Asbestos Cement	120.0	-2	0.06
261	129	J-114	J-126	6.0	Asbestos Cement	120.0	38	0.43
264	141	J-127	J-40	4.0	PVC	140.0	-16	0.42
270	148	J-130	J-118	4.0	PVC	140.0	-62	1.59
273	157	J-93	J-67	4.0	PVC	140.0	28	0.71
274	158	J-127	J-131	4.0	PVC	140.0	0	0.00
276	158	J-59	J-53	4.0	PVC	140.0	-8	0.21
279	193	J-132	J-133	4.0	Asbestos Cement	120.0	38	0.97
282	196	J-134	J-99	4.0	PVC	140.0	32	0.82
287	216	J-136	J-127	4.0	PVC	140.0	-16	0.42
289	221	J-73	J-136	4.0	PVC	140.0	32	0.82

Scatchet Head Water District - 2019 Water System Plan
Pipe Table - Time: 0.00 hours

ID	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
290	234	J-137	J-138	6.0	Asbestos Cement	120.0	38	0.43
293	239	J-133	J-97	4.0	Asbestos Cement	120.0	38	0.97
294	245	J-54	J-130	4.0	Asbestos Cement	120.0	-62	1.59
295	264	J-47	J-134	4.0	PVC	140.0	-33	0.85
297	281	J-138	J-132	6.0	Asbestos Cement	120.0	38	0.43
298	282	J-136	J-95	4.0	PVC	140.0	28	0.71
299	290	J-96	J-81	4.0	PVC	140.0	28	0.71
300	307	J-122	J-77	4.0	PVC	140.0	14	0.36
301	335	J-126	J-137	6.0	Asbestos Cement	120.0	38	0.43
302	583	J-98	J-109	4.0	PVC	140.0	31	0.79
303	7	J-139	J-140	6.0	PVC	140.0	659	7.47
329	19	J-156	J-157	6.0	PVC	140.0	81	0.91
335	20	J-160	J-161	6.0	PVC	140.0	29	0.33
338	21	J-162	J-163	6.0	PVC	140.0	-233	2.65
341	22	J-164	J-165	6.0	PVC	140.0	272	3.09
347	23	J-168	J-169	6.0	PVC	140.0	-239	2.72
350	23	J-170	J-171	6.0	PVC	140.0	29	0.33
358	25	J-175	J-176	6.0	PVC	140.0	-6	0.07
361	25	J-156	J-177	6.0	PVC	140.0	62	0.71
365	27	J-178	J-179	6.0	PVC	140.0	8	0.09
387	29	J-165	J-192	6.0	PVC	140.0	-35	0.40
389	32	J-191	J-193	6.0	Asbestos Cement	120.0	-309	3.51
391	32	J-150	J-194	6.0	Asbestos Cement	120.0	-54	0.61
393	32	J-195	J-196	6.0	Asbestos Cement	120.0	-93	1.05
398	33	J-198	J-199	6.0	PVC	140.0	-432	4.91
401	34	J-200	J-201	6.0	PVC	140.0	29	0.33
411	37	J-206	J-207	6.0	PVC	140.0	-290	3.29
415	39	J-196	J-208	6.0	Asbestos Cement	120.0	211	2.39
417	39	J-209	J-210	6.0	PVC	140.0	-118	1.34
423	40	J-198	J-213	6.0	PVC	140.0	716	8.12
441	45	J-222	J-164	6.0	PVC	140.0	272	3.09
443	45	J-223	J-224	6.0	Asbestos Cement	120.0	304	3.45
456	49	J-230	J-231	6.0	Asbestos Cement	120.0	-309	3.51
461	50	J-233	J-234	4.0	Asbestos Cement	120.0	-14	0.36
464	51	J-235	J-236	6.0	Asbestos Cement	120.0	-500	5.68

Scatchet Head Water District - 2019 Water System Plan
Pipe Table - Time: 0.00 hours

ID	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
469	53	J-169	J-238	6.0	Asbestos Cement	120.0	-93	1.05
473	53	J-240	J-241	6.0	PVC	140.0	-300	3.40
480	55	J-140	J-244	6.0	Asbestos Cement	120.0	375	4.26
484	57	J-192	J-246	6.0	PVC	140.0	-35	0.40
486	57	J-171	J-247	6.0	PVC	140.0	29	0.33
488	60	J-234	J-16	4.0	Asbestos Cement	120.0	-14	0.36
492	65	J-207	J-43	6.0	PVC	140.0	-290	3.29
495	67	J-247	J-160	6.0	PVC	140.0	29	0.33
496	68	J-169	J-251	6.0	PVC	140.0	-153	1.73
498	69	J-252	J-210	6.0	PVC	140.0	-153	1.73
500	70	J-253	J-254	6.0	Asbestos Cement	120.0	62	0.70
503	71	J-255	J-256	6.0	PVC	140.0	75	0.85
506	72	J-241	J-257	6.0	PVC	140.0	-300	3.40
509	78	J-258	J-259	4.0	Asbestos Cement	120.0	-36	0.92
512	79	J-260	J-261	6.0	PVC	140.0	8	0.09
515	79	J-262	J-134	6.0	PVC	140.0	74	0.84
517	79	J-161	J-173	6.0	PVC	140.0	-145	1.65
522	88	J-264	J-235	6.0	Asbestos Cement	120.0	-500	5.68
524	94	J-265	J-230	6.0	Asbestos Cement	120.0	-309	3.51
530	96	J-140	J-222	6.0	PVC	140.0	272	3.09
534	99	J-224	J-270	6.0	Asbestos Cement	120.0	304	3.45
537	100	J-271	J-272	6.0	PVC	140.0	296	3.36
540	101	J-172	J-273	6.0	PVC	140.0	149	1.69
545	103	J-157	J-276	6.0	PVC	140.0	81	0.91
547	107	J-277	J-194	6.0	Asbestos Cement	120.0	62	0.70
559	125	J-43	J-240	6.0	PVC	140.0	-300	3.40
560	127	J-254	J-282	6.0	Asbestos Cement	120.0	62	0.70
562	137	J-199	J-264	6.0	Asbestos Cement	120.0	-494	5.61
563	142	J-270	J-196	6.0	Asbestos Cement	120.0	304	3.45
564	145	J-251	J-252	6.0	PVC	140.0	-153	1.73
565	154	J-281	J-253	6.0	Asbestos Cement	120.0	62	0.70
566	155	J-172	J-260	6.0	PVC	140.0	8	0.09
567	157	J-283	J-279	6.0	Asbestos Cement	120.0	-54	0.61

Scatchet Head Water District - 2019 Water System Plan
Pipe Table - Time: 0.00 hours

ID	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
571	160	J-285	J-283	6.0	Asbestos Cement	120.0	-54	0.61
573	161	J-282	J-277	6.0	Asbestos Cement	120.0	62	0.70
575	166	J-286	J-156	6.0	PVC	140.0	149	1.69
577	167	J-257	J-278	6.0	PVC	140.0	-308	3.49
578	167	J-236	J-206	6.0	PVC	140.0	-290	3.29
583	181	J-227	J-239	6.0	PVC	140.0	-48	0.55
584	186	J-274	J-139	6.0	PVC	140.0	659	7.47
585	196	J-193	J-265	6.0	Asbestos Cement	120.0	-309	3.51
586	200	J-288	J-202	6.0	Asbestos Cement	120.0	-220	2.50
588	204	J-177	J-155	6.0	PVC	140.0	62	0.71
589	207	J-244	J-223	6.0	Asbestos Cement	120.0	375	4.26
590	212	J-255	J-289	4.0	Asbestos Cement	120.0	-69	1.76
592	221	J-208	J-236	6.0	Asbestos Cement	120.0	211	2.39
593	222	J-261	J-178	6.0	PVC	140.0	8	0.09
594	227	J-163	J-168	6.0	PVC	140.0	-233	2.65
595	228	J-250	J-290	6.0	PVC	140.0	-150	1.70
597	228	J-287	J-291	6.0	Asbestos Cement	120.0	-54	0.61
599	256	J-276	J-145	6.0	PVC	140.0	81	0.91
600	263	J-16	J-258	4.0	Asbestos Cement	120.0	-36	0.92
602	282	J-201	J-170	6.0	PVC	140.0	29	0.33
603	282	J-197	J-191	6.0	Asbestos Cement	120.0	-232	2.63
604	284	J-288	J-292	6.0	PVC	140.0	-66	0.75
606	307	J-210	J-288	6.0	Asbestos Cement	120.0	-271	3.07
607	317	J-213	J-293	6.0	PVC	140.0	716	8.12
609	321	J-184	J-286	6.0	PVC	140.0	149	1.69
610	324	J-259	J-289	4.0	Asbestos Cement	120.0	-36	0.92
611	332	J-162	J-271	6.0	PVC	140.0	296	3.36
612	351	J-272	J-187	6.0	PVC	140.0	296	3.36
613	354	J-289	J-209	6.0	PVC	140.0	-118	1.34
615	370	J-238	J-195	6.0	Asbestos Cement	120.0	-93	1.05
616	390	J-231	J-274	6.0	PVC	140.0	-309	3.51
617	398	J-292	J-223	6.0	PVC	140.0	-66	0.75
618	426	J-291	J-285	6.0	Asbestos Cement	120.0	-54	0.61
619	462	J-176	J-233	6.0	Ductile Iron	130.0	-14	0.16

Scatchet Head Water District - 2019 Water System Plan

Pipe Table - Time: 0.00 hours

ID	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
620	484	J-246	J-185	6.0	PVC	140.0	-35	0.40
621	569	J-256	J-162	6.0	PVC	140.0	75	0.85
622	650	J-175	J-255	6.0	PVC	140.0	6	0.07
626	65	J-296	J-294	8.0	PVC	140.0	523	3.34
628	90	J-290	J-297	8.0	PVC	140.0	552	3.52
630	90	J-297	J-200	8.0	PVC	140.0	552	3.52
631	130	J-293	J-290	8.0	PVC	140.0	716	4.57
632	201	J-200	J-296	8.0	PVC	140.0	523	3.34
657	20	T-1	J-302	6.0	Ductile Iron	130.0	968	10.98
658	7	J-302	J-301	6.0	Ductile Iron	130.0	722	8.20
659	7	J-301	J-300	6.0	Ductile Iron	130.0	480	5.45
660	7	J-300	J-299	6.0	Ductile Iron	130.0	240	2.72
661	10	J-299	PMP-1	6.0	Ductile Iron	130.0	240	2.72
662	10	PMP-1	J-303	6.0	Ductile Iron	130.0	240	2.72
663	7	J-303	J-304	6.0	Ductile Iron	130.0	240	2.72
664	7	J-304	J-305	6.0	Ductile Iron	130.0	480	5.45
665	7	J-305	J-306	6.0	Ductile Iron	130.0	722	8.20
666	115	J-306	J-274	6.0	Ductile Iron	130.0	968	10.98
667	10	J-300	PMP-2	6.0	Ductile Iron	130.0	240	2.73
668	10	PMP-2	J-304	6.0	Ductile Iron	130.0	240	2.73
669	10	J-301	PMP-3	6.0	Ductile Iron	130.0	242	2.75
670	10	PMP-3	J-305	6.0	Ductile Iron	130.0	242	2.75
671	10	J-302	PMP-4	6.0	Ductile Iron	130.0	245	2.78
672	10	PMP-4	J-306	6.0	Ductile Iron	130.0	245	2.78
677	20	R-3	PMP-8	2.5	PVC	140.0	318	20.80
680	20	PMP-7	R-2	4.0	PVC	140.0	-330	8.42
683	28	J-294	T-2	8.0	PVC	140.0	523	3.34
688	10	J-53	PRV-1	4.0	PVC	150.0	54	1.38
689	10	PRV-1	J-29	4.0	PVC	150.0	54	1.38
691	110	J-66	PRV-2	4.0	PVC	140.0	26	0.66
692	208	PRV-2	J-125	4.0	PVC	140.0	26	0.66
694	14	J-114	PRV-3	6.0	PVC	140.0	-54	0.61
695	156	PRV-3	J-284	6.0	Asbestos Cement	120.0	-54	0.61
697	25	PMP-7	J-307	4.0	PVC	140.0	330	8.42
698	20	PMP-8	J-307	4.0	PVC	140.0	318	8.13
699	95	J-307	T-1	6.0	PVC	150.0	648	7.35
700	57	J-141	J-279	6.0	PVC	140.0	54	0.61
701	156	J-227	J-185	6.0	PVC	140.0	35	0.40
702	137	J-191	J-218	6.0	PVC	140.0	58	0.66
703	94	J-218	J-239	6.0	PVC	140.0	58	0.66
704	99	J-202	J-197	6.0	Asbestos Cement	120.0	-232	2.63
705	270	J-165	J-278	6.0	PVC	140.0	308	3.49
706	117	J-250	J-204	6.0	PVC	140.0	150	1.70
707	96	J-204	J-173	6.0	PVC	140.0	150	1.70
708	130	J-161	J-172	6.0	PVC	140.0	164	1.86

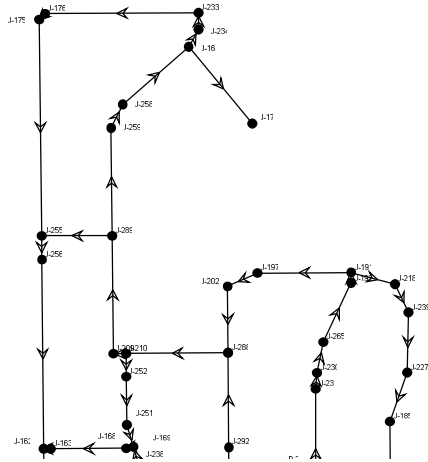
Scatchet Head Water District - 2019 Water System Plan
Pipe Table - Time: 0.00 hours

ID	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)
709	277	J-273	J-184	6.0	PVC	140.0	149	1.69
710	300	J-155	J-181	6.0	PVC	140.0	62	0.71
711	74	J-181	J-142	6.0	PVC	140.0	62	0.71
712	57	J-142	J-118	6.0	PVC	140.0	62	0.71
713	256	J-40	J-37	2.0	PVC	140.0	0	0.00
714	226	J-47	J-91	4.0	PVC	140.0	22	0.57
715	166	J-47	J-42	2.0	PVC	140.0	3	0.31
716	56	J-145	J-243	6.0	PVC	140.0	81	0.91
717	339	J-243	J-262	6.0	PVC	140.0	74	0.84
718	235	J-85	J-94	4.0	Asbestos Cement	120.0	-2	0.06
719	89	J-66	J-67	4.0	PVC	140.0	-28	0.71
720	224	J-125	J-64	4.0	PVC	140.0	26	0.66
721	372	J-111	J-63	4.0	PVC	140.0	-5	0.13
722	311	J-77	J-84	4.0	PVC	140.0	7	0.18
723	609	J-69	J-94	4.0	Asbestos Cement	120.0	8	0.21
724	147	J-79	J-93	4.0	PVC	140.0	28	0.71
725	92	J-73	J-99	4.0	PVC	140.0	-32	0.82
726	97	J-81	J-102	4.0	PVC	140.0	28	0.71
727	684	J-10	J-51	2.0	PVC	140.0	9	0.92
728	601	J-10	J-52	2.0	PVC	140.0	7	0.71
729	137	J-64	J-10	4.0	PVC	140.0	21	0.54
730	856	J-107	J-109	4.0	PVC	140.0	-24	0.61
731	539	J-113	J-135	2.0	PVC	140.0	16	1.63
732	423	J-287	J-284	6.0	Asbestos Cement	120.0	54	0.61
734	217	J-2	J-6	2.0	PVC	140.0	6	0.61
735	370	J-22	J-2	2.0	PVC	140.0	-8	0.82
738	210	J-9	J-2	2.0	PVC	140.0	14	1.43
739	166	J-25	J-12	2.0	PVC	140.0	40	4.08
740	345	J-9	J-23	2.0	PVC	140.0	12	1.23
741	135	J-30	J-32	2.0	PVC	140.0	40	4.08
742	138	J-267	J-141	6.0	Asbestos Cement	120.0	54	0.61
743	456	J-150	J-267	6.0	Asbestos Cement	120.0	54	0.61
744	292	J-212	J-281	6.0	Asbestos Cement	120.0	62	0.70
745	199	J-226	J-212	6.0	Asbestos Cement	120.0	62	0.70
746	230	J-199	J-226	6.0	Asbestos Cement	120.0	62	0.70
747	65	J-187	J-205	6.0	PVC	140.0	296	3.36
748	118	J-205	J-198	6.0	PVC	140.0	290	3.30

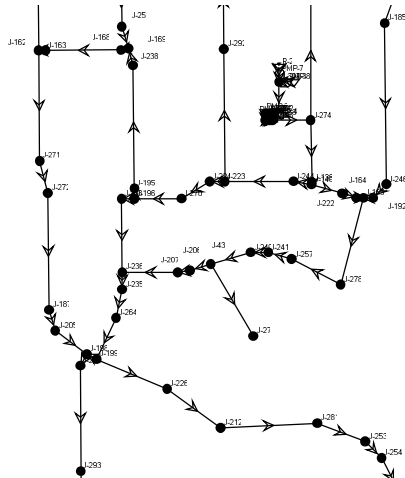
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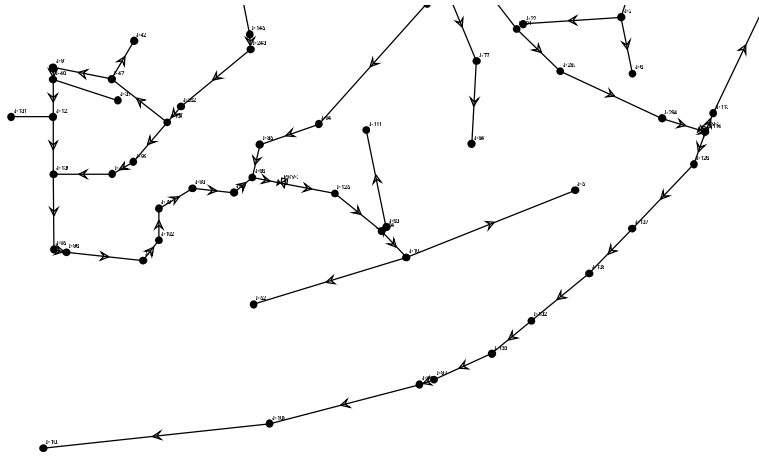
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APPENDIX N Technical Specifications

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**Scatchet Head Water District
3792 East Hubble Court
Clinton, WA 98236**

**STANDARD SPECIFICATIONS
WATER MAIN INSTALLATION**

WATER MAIN INSTALLATION**PART 1 – GENERAL**

These specifications cover the minimum standards for the installation of 2 to 12 – inch diameter water mains complete with valve, fittings, fire hydrants, appurtenances, etc. These specifications include minimum material specifications for bedding and backfill, pipe, valves, fire hydrants, and other associated items.

These specifications shall be used in conjunction with the contract documents provided by the Owner or Bidder, and with the other portions of the Project Report containing these specifications. These specifications and accompanying (drawings were prepared assuming the work would be done by the system operator, or under the direct supervision of the system manager; this operator or manager having knowledge of the existing plant and equipment, and underground utilities.

Where American Water Works Association Standards (AWWA), American Society for Testing Materials Standards (ASTM), Washington State Department of Transportation Standard Specifications for Road, Bridges and Municipal Construction, (WSDOT Standard Specifications) or other standards are referenced within, any further statement of requirements is for the purpose of either highlighting important details of the Standards or to impose more stringent requirements.

No substitution for the material specified herein or in the engineering drawings shall be made without prior approval of the Owner. No change of the water main alignment, water main diameter, etc. shown on the engineering drawings may be made without the prior approval of the Owner and Engineer.

Where the manufacturer’s product is specified by name and model, the intent is to:

- a) establish a minimum standard where either an AWWA Standard is not available, or where the standard of performance exceeding the AWWA Standards is desired,
- b) conform to existing products in the distribution system or to provide inventory uniformity for the purpose of maintenance.

The approval of alternate materials to those specified by manufacturer’s name and model, as a “approved equal” shall be at the sole discretion of the Owner.

PART 2 – MATERIALS**2.1 WATER MAINS**

Unless otherwise specified in the drawings, all water mains 4, 6 and 8-inch diameter shall be either ductile iron pipe (D.I.) or polyvinyl chloride (PVC) pressure pipe conforming to the following specifications. All "yard" piping at the reservoir site, or into or under a building or other structural foundation, shall be ductile iron.

All ductile iron pipe shall be class 50 single cement lined, with "Tyton" or mechanical joints, conforming to the following American Water Works Association (AWWA) Standards:

- a) C104/A21.4-16 "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings"
- b) C111/A21.11-17 "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings"
- c) C151/A21.51-17 "Ductile-Iron Pipe, Centrifugally Cast"

Ductile iron pipe with screwed flanges, welded restraining rings, or EBAA IRON or similar restraining glands and/or flange adapters shall be minimum thickness Class 53, except. that EBAA IRON "MEGALUG" and "MEGAFLANGE" restraint may be used on Class 50 ductile iron.

Where its use is specified by the Engineer, polyethylene encasement installed on ductile iron pipe, valves and fittings shall conform to AWWA Standard:

- a) C105-10 "Polyethylene Encasement for Ductile-Iron Pipe Systems"

All polyvinyl chloride (PVC) pressure pipe shall be pressure class 150 conforming to AWWA Standards:

- a) C900-16 "Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In. (100 mm Through 1,500 mm)"

All fittings 4-inch and larger shall be single cement lined ductile iron or grey iron conforming to the following AWWA Standard:

- a) C104/A21.4-16 "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings"
- b) C110-12 "Ductile-Iron and Gray-Iron Fittings"
- c) C111/A21.11-17 "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings"

All fittings 2-inch through and including 3-inch mains (e.g., raw water supply pipe from wells to treatment), shall be polyvinyl chloride (PVC) pressure pipe, class 200, rubber-ring joint, Pacific Western Extruded Plastics Co. (P W Pipe), "Twin Seal" or Engineer approved equal.

2.2 VALVES

All valves 4 through 12-inch in diameter shall conform to the following AWWA Standards:

- a) C509-09 "Resilient-Seated Gate Valves for Water Supply Service"
- b) C111/A21.11-17 "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings"

2.3 FIRE HYDRANTS

All fire hydrants shall be dry barrel, compression type, with 4.5-inch pumper port and two 2.5-inch outlets, 6-inch inlet, and 1 3/16-inch pentagon operating nut conforming to the following AWWA Standard:

- a) C502-18 "Dry-Barrel Fire Hydrants"

2.4 SERVICE PIPE

All 3/4-inch to 2-inch water service pipes shall be pressure class 200 psi, iron pipe size polyethylene, PE 3406 resin, conforming to the following AWWA Standard:

- a) C901-17 "Polyethylene (PE) Pressure Pipe and Tubing, 3/4 In. (19 mm) Through 3 In. (76 mm), for Water Service"

All water services larger than 2-inch shall conform to the standards for water mains in Section 2.1 above.

2.5 BRASS FITTINGS

All miscellaneous fittings shall be brass conforming to the following AWWA Standard:

- a) C800-14 "Underground Service Line Valves & Fittings"

No steel or galvanized fittings shall be used.

Fittings shall be of the compression type as manufactured by Mueller, Decatur, Illinois, series 110 Compression Connections; or by Ford Meter Box Co., Wabash, Indiana, Pack Joint Coupling series. The coupling shall be supplied with stainless steel tube liner where required by the manufacturer, and shall be compatible with polyethylene service pipe thickness and diameter (see Section 2.5, above).

Curb stops, where used for blow offs, air valves, etc., shall be o-ring type as manufactured by Mueller, Decatur, Illinois, series Mark II Oriseal c/w tee head, or Engineer approved equal.

Branch connections, where used on a dual service line (two customers supplied from one service connection) shall be 1 x 3/4 x 3/4-inch "Y" style c/w compression fittings (specified as above) as

manufactured. by Mueller, Decatur, Illinois, series Mark II Oriseal c/w tee head, or Engineer approved equal.

Meter setters shall incorporate compression inlet and outlet fittings, upstream angle ball valve as manufactured by Ford Meter BOX Co., Wabash, Indiana, or Engineer approved equal, and outlet fitting with an angle pattern residential dual check valve backflow preventer, complying with ASSE Standard 1024, as manufactured by Watts Regulators Co., Lawrence, MA, Series 7A or Engineer approved equal.

2.6 VALVE BOXES

All valve boxes shall be cast iron slip type with bottom flange and "WATER" cover as manufactured. by VanRich Casting Corp., Portland, OR, Model 920 Standard or Engineer approved equal.

2.7 BACKFLOW PREVENTION ASSEMBLIES

Health approved, and University of Southern California Foundation for Cross Connection Control and Hydraulic Research (USC FCCCHR) approved.

State and USC FCCCHR approval is not required where residential dual check valve backflow preventers are installed with water meters as a voluntary means (i.e., where backflow prevention is not a requirement) of providing premise isolation.

2.8 MARKING TAPE

Marking tape for PVC mains and polyethylene services shall be of the detectable type (with metallic foil laminate) with plastic jacket, 6-inch wide, blue color with wording "WATER LINE", as manufactured by Calpico, San Francisco, CA, or Engineer approved equal.

2.9 AIR RELEASE VALVES

Unless otherwise specified in the Plans, all air valves shall be 3/4-inch simple lever air release type, as manufactured by Valve-Matic, Elmhurst, Illinois, Model 22, Or Engineer approved equal.

2.10 METER BOXES

Unless otherwise specified in the Plans, water meter boxes shall be plastic body and cover, as manufactured by Ametek, Sheboygan, Wisconsin, series 17014 and 190109 (corresponding to meter size) or Engineer approved equal. The meter box shall be of adequate size to accommodate both the meter and meter setter, also the dual check valve backflow preventer.

2.11 WATER METERS

Water meters to single family residential customers shall be 3/4 x 3/4 inch displacement type, SENSUS SR II, with registration in cubic feet, as manufactured by Senses Technologies, Uniontown, PA. conforming to the following AWWA Standard:

- a) C700-15 "Cold-Water Meters – Displacement Type, Metal Alloy Main Case"

2.12 SERVICE SADDLES

Service saddles shall be furnished with a ductile iron body and IPS standard tapping, with a neoprene or Buna-N rubber gasket cemented in place. Saddles shall be double strap for PVC pipe (saddles required for all service sizes), as manufactured by Mueller, Decatur, Illinois, or Engineer approved equal. Services may be direct tapped into ductile iron pipe.

2.13 CONTROL CABLE

With the new water mains, should the Owner elect to install new control cable to a reservoirs or well site, the cable shall be 8 wire #14 Type PTN direct burial control cable, laid continuously, without buried splices, from the pump house to the reservoir site.

PART 3 – INSTALLATION

3.1 GENERAL

Unless otherwise specified in the Plans or in these specifications, water mains shall be installed in accordance with the manufacturer's printed specifications, to American Water Works Association (AWWA) Standards and with the most recent "*Standard Specifications for Road, Bridge and Municipal Construction*", prepared by the Washington State Department of Transportation, or the latest edition thereof. References to "Section", "Paragraphs", or "Divisions" indicated by number hereinafter pertain to these WSDOT Standard Specifications.

3.2 TRENCHING AND BACKFILL

Trenching, foundation, bedding and backfilling for water mains and incidental piping shall conform to WSDOT Standard Specifications Section 7-10, except that backfill for flexible pipe ("initial backfill" in the detail) shall be extended 12-inches over the crown of the pipe.

The requirements to bedding and backfill for ductile iron and PVC pipe are summarized in the Plans, attached hereto.

Unless otherwise specifically approved by the Engineer, only imported material conforming to Section 9-03.16 shall be used for bedding (layer under the pipe), haunching (layer to spring line)

and initial backfill. Native material may be approved by the Engineer if it fully complies with WSDOT Standard Specifications Section 9-03.15 and. Section 9-03.16. PVC pipe shall be considered "Flexible pipe" with respect to this section. Where a request for use of native material is made by the Contractor, the material shall be evaluated prior to use by a qualified material testing lab. and certified that it meets the requirements of the above referenced WSDOT Standard Specification Sections. The Engineer may require periodic testing to ensure continuing material conformance. The cost of all such testing shall be borne by the Contractor.

In Island County right-of-way, where water mains or services are laid under pavement or in the road shoulder backfill above the initial backfill shall conform to Section 7-10.3(11) and Section 9-03.19. In other areas native material may be used above the initial backfill. In ditches, the backfill shall comply with any additional requirements imposed by Island County, such as the use of quarry stone for erosion control.

Unless otherwise specified in the Plans all water main excavations shall be made by open cut. All trenches shall be excavated to true and smooth bottom grades in accordance with the lines given in the Plans. The trench bottom shall provide uniform bearing and support for each length of pipe.

Bell holes shall be excavated to the extent necessary to permit accurate work in making and inspecting the joints. The banks of the trenches shall be kept as nearly vertical as soil conditions will permit, and where required to control trench width or to protect adjacent structures, the trench shall be sheeted and braced.

Care shall be taken not to excavate below the depth specified, unless to remove unsuitable materials. Excavation below the grade of the pipe shall be backfilled with select backfill material and compacted as specified herein.

3.3 PIPE LAYING

Except as noted below, water mains and services shall be laid in accordance with the procedures outlined in WSDOT Standard Specifications Section 7-11.

Water mains shall be laid to provide minimum cover of three feet. The depth of the water main. may be increased as necessary to pass under other utilities, culverts, etc. Whenever possible, grade changes for passing other utilities shall be made by gradually varying trench depth.

Unless otherwise approved by the Engineer, water mains shall be laid with at least 10-foot horizontal and 18-inch vertical separation from sanitary or storm sewer, and 3-foot horizontal and 12-inch vertical separation from all other utilities.

Where the water main crosses a sanitary or storm sewer, but cannot be laid within a minimum 18-inch vertical separation,

- a) one 18-foot length of water pipe shall be laid so joints are equal distance from the sewer, and

- b) the sewer pipe shall be either replaced with ductile iron pipe with joints equally spaced from the water pipe or encased in concrete.

Where the water main must be installed below the sewer, the water main shall be installed with a minimum 18-inch vertical separation and the sewer pipe replaced with ductile iron pipe as detailed in (b) above.

Ductile iron water mains shall be installed in accordance with the following AWWA Standard:

- a) C600-10 "Installation of Ductile-Iron Mains and Their Appurtenances"

PVC water mains shall be installed in accordance with the Uni-Bell Plastic Pipe Association's publication "*Handbook of PVC Pipe*", **except as noted below**, where more stringent requirements are specified.

All PVC pipe shall be installed without deflection at the pipe joint of more than 2 degrees, or 80 percent of the maximum allowable by the pipe manufacturer, whichever is the lesser. **All PVC pipe shall be installed without bending of the pipe lengths.** All additional changes in both horizontal and vertical alignment shall be made by the deflection of mechanical joints (MJ) at fittings; additional MJ sleeves shall be installed as necessary.

Ductile iron pipe joint deflection shall be limited to 4 degrees (80 percent of maximum allowable under AWWA C600).

On road curves, either short lengths of pipe or MJ sleeves shall be used as needed to limit the pipe joint deflection to within the above noted values. Short lengths and/or fittings shall be utilized on curves of radius less than 280-feet for ductile iron pipe, and 570-feet for PVC pipe.

All PVC pipe and polyethylene services shall be installed with detectable marking (warning) tape installed one foot above the PVC pipe or PE service and brought up to the surface within all valve boxes and fire hydrants.

Unless otherwise specified in the Plans, all cast iron or ductile iron fittings used on AWWA C-900 PVC pipe shall have mechanical joint ends.

Where more than one pipe is installed in a trench, special care shall be taken to provide adequate bedding at and below the spring of the larger pipe. Provide a minimum of 4-inchs clearance between pipes. Where an electrical telemetry cable is also installed in the trench, the cable shall be installed at the spring line elevation of the largest pipe.

All buried galvanized steel pipe fittings, and all exposed steel pipe or ductile iron pipe threads shall be tightly wrapped with two layers of PVC tape.

3.4 THRUST BLOCKS

All thrust blocks shall be capable of resisting the thrust created from the application of a 225-psi hydrostatic test pressure (i.e., 1.5 times the rated working pressure of the water main material). The minimum bearing area and placement of thrust blocks shall conform to the Plans, attached hereto.

All concrete thrust blocks, fitting support, etc., shall be Class 3000 per WSDOT Standard Specification Section 7-11.

3.5 FIRE HYDRANTS

Fire hydrants shall be installed in accordance with the Plans, attached hereto.

3.6 BLOW-OFFS

Blow-offs shall be installed in accordance with the Plans, attached hereto..

3.7 SERVICE TAPPING

The tapping of a water main under pressure ("wet" tapping) shall only be done by a Contractor approved by the Engineer. The "wet" tapping of PVC or Asbestos Cement pipe shall only be done after the Owner has partly closed the mains isolating valves to reduce flooding damage should the pipe rupture during tapping.

Service connections 3/4-inch to 2-inch in diameter shall be installed in accordance with the Plans, attached hereto. Services shorter than 60 feet in length shall be installed without splices.

Details of service connections over 2-inch in diameter shall be shown in the Plans for the water main installation or site servicing

3.8 WATER METERS

Meters 3/4-inch to 2-inch in diameter shall be installed in accordance with the Plans, attached hereto.

Installation details for meters larger than 2-inch in diameter shall be shown on the Plans for the water main installation or site servicing. Meters shall be installed with isolating valves and bypass in accordance with the Plans, attached hereto.

3.9 BACKFLOW PREVENTION ASSEMBLIES

All backflow prevention assemblies shall be installed in accordance with the recommendations outlined in *Cross Connection Control Manual, Accepted Procedures and Practices, December 1995* or latest edition thereof, published by the Pacific Northwest Section, American Water Works Association.

Installation details for backflow prevention assemblies larger than 2-inch in diameter shall be shown on the Plans for the water main installation or site servicing.

3.10 AIR RELEASE VALVES

All air valves shall be vented above ground level to prevent the backflow of groundwater. The air valve shall be installed in accordance with the Plans, attached hereto.

Installation details for meters larger than 2-inch in diameter shall be shown on the Plans for the water main installation or site servicing. Meters shall be installed with isolating valves and bypass in accordance with the Plans, attached hereto.

PART 4 – DISINFECTION

All new mains and repaired portions or, or extensions to, existing mains shall be disinfected in accordance with following AWWA Standard:

- a) C651-14 “Disinfecting Water Mains”

The placing of calcium hypochlorite granules in each pipe section during laying, as outlined in Section 5.1 “Tablet Method” of AWWA Standard C651, without the additional placement of calcium hypochlorite tablets, shall be done only on mains and services less than 100-feet in length, unless otherwise approved by the Engineer.

Where water is encountered in the trench, care shall be taken to ensure that no water or other deleterious materials enter the pipe at any time. Under all conditions, care shall be taken in handling pipe and appurtenances to insure to ensure that no deleterious materials enter the pipe, fittings, valves, etc. Special care shall be taken during the installation to ensure that dirt or other foreign matter does not enter a push-on or mechanical joint of a pipe, valve, fitting, etc.

During the laying of a water main, should dirt or other foreign material enter any pipe, fitting, valve, etc., the main shall be removed, cleaned and re-laid. Should sewage enter a main or portion thereof, the main or portion thereof, shall be rejected and all pipe, fittings, valves, etc. discarded.

All water supplied from the existing water system or other approved potable supply shall be connected to the new main through a State of Washington Department of Health "APPROVED" double check valve assembly (DCVA). Such DCVA shall be tested immediately prior to its use by a State Certified backflow prevention assembly tester to verify that it meets State performance requirements. The Contractor shall submit a copy of the tester's test report to the Engineer prior to use of DCVA.

Existing service shall not be transferred to a new water main until a satisfactory bacteriological test report is obtained for the new construction and approval is given by the Engineer.

The final connection to the existing system shall not be made until specifically authorized by the Engineer. Such authorization shall not be made until a satisfactory bacteriological test report is obtained by the Engineer.

All water main components used to make the final closure between the existing and new water main shall be disinfected immediately prior to the installation in accordance with Section 9.2 of AWWA Standard C651. All equipment used to supply water for water main flushing and disinfection, e.g., standpipe, portable pumps, hose, etc., shall be disinfected immediately prior to use in accordance with Section 9.2 of AWWA Standard C651.

PART 5 – LEAKAGE AND HYDROSTATIC PRESSURE TEST

Except as noted below, all water mains (ductile iron or polyvinyl chloride (PVC) pressure pipe) shall be subject to a hydrostatic pressure test and leakage test in accordance with following AWWA Standard:

- a) C600-10 "Installation of Ductile-Iron Mains and Their Appurtenances"

All equipment used by the Contractor for the hydrostatic pressure test and leakage test shall have prior approval of the Engineer.

The test pressure shall be 225-psi (i.e., 1.5 times the rated working pressure of the water main material) applied at the lowest point in the pipeline. The duration of the hydrostatic pressure test shall be 2-hours, during which time the hydrostatic pressure shall not vary by more than 5-psi.

Where in the opinion of the Engineer a 2-hour pressure test is impractical, the duration of the test may be reduced to 15 minutes, as specified in the WSDOT Standard Specification Section 7-11.3 (11), provided no leakage is detected, (i.e, no loss of pressure). Should leakage occur, the test duration shall be 2-hours.

The leakage test shall be performed only after the Engineer's acceptance of the hydrostatic pressure test. The completion of the pressure test without loss of pressure (i.e., without the need for makeup water), shall be considered as completion of the leakage test.

No water main installation shall be accepted if the leakage is greater than that determined by the formula:

$$L = \frac{SD [P]^{0.5}}{133,200}$$

where:

- L = allowable leakage, in gallons per hour
- S = total length of main tested, in feet
- D = nominal diameter of the main, in inches
- P = avg. test pressure during leakage test, in psi

The leakage test pressure shall be applied at the location of the hydrostatic pressure test and shall be the same pressure and duration as the hydrostatic pressure test.

For acceptance of the new water main installation, any visible leakage detected shall be repaired regardless of the allowable leakage specified above.

PART 6 – PAVEMENT REPAIR AND SURFACE RESTORATION

All existing asphalt and portland cement concrete pavement, gravel or crushed rock surface treatments, sidewalks, curbs, gutters, and landscaped surfaces cut or damaged by the installation of sub-surface facilities shall be restored with like materials to original levels, flush, well bonded to adjacent sound material along neat, continuous straight or curved joint lines. Where indicated in the Plans or required by the Engineer for dust or erosion control, or reasons of safety, temporary surface treatments shall be provided. Materials used and methods of construction shall be as shown in the plans and details as specified in WSDOT Standard Specifications Division 9.

APPENDIX O Capital Improvement Projects

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Component Inventory and Assessment

System:	Scatchet Head Water District
PWS ID#	76470 X
Location:	7906 Guemes Ave, Clinton, WA 98236
Owner:	Scatchet Head Water District
Operator:	King Water Management Co.
Operator Address:	PO Box 2243, Oak Harbor, WA 98277
Prepared By:	Tabatha Dye, EIT & Robert Bennion, PE

Component	Component Information	Installed Date	Effective Life	Condition Rating	Critical Number	Remaining Life	Replacement Cost/Unit	Quantity	Unit	Replacement Total Cost	Inflation Rate	Replace in 6 Years?	Future Cost
Well #2	10", 295' Depth	1980	50	1	2	11	\$ 30,000	1	LS	\$ 30,000	2.0%	No	\$ 37,301
Well #2 Pump	Goulds 160CLC030 30 HP	1999	15	1	2	-5	\$ 6,000	1	LS	\$ 6,000	2.0%	Yes	\$ 6,000
Well #3	8", 403' Depth	1997	50	1	2	28	\$ 30,000	1	LS	\$ 30,000	2.0%	No	\$ 52,231
Well #3 Pump	Goulds 70J15 15 HP	1999	15	1	2	-5	\$ 6,000	1	LS	\$ 6,000	2.0%	Yes	\$ 6,000
Well Meters		1995	25	2	2	1	\$ 1,500	2	EA	\$ 3,000	2.0%	Yes	\$ 3,060
Well Controls		1995	15	2	1	-9	\$ 2,000	1	LS	\$ 2,000	2.0%	Yes	\$ 2,000
Chlorinator	LMI Series A17	2001	30	2	2	12	\$ 2,000	1	LS	\$ 2,000	2.0%	No	\$ 2,536
Treatment System	Filtration: (4) 48"D, 463 gal Tanks	2001	30	3	1	12	\$ 20,000	1	LS	\$ 20,000	2.0%	No	\$ 25,365
Storage Reservoir #1	Guemes 300,000 (24.5' D x 85' T)	1980	60	3	1	21	\$ 2	300,000	GAL	\$ 450,000	2.0%	No	\$ 682,050
Storage Reservoir #2	Maple Point 120,000 (14.6' D x 95' T)	1997	60	3	2	38	\$ 2	120,000	GAL	\$ 180,000	2.0%	No	\$ 382,014
Reservoir Controls		1999	15	4	2	-5	\$ 5,000	1	LS	\$ 5,000	2.0%	Yes	\$ 5,000
Pressure Tank	Canal Boiler Works (66" D x 10' L)	1980	10	2	1	-29	\$ 10	2,120	GAL	\$ 21,200	2.0%	Yes	\$ 21,200
Air Charger	Whitewater Air Rite D610	1999	15	2	2	-5	\$ 3,000	1	EA	\$ 3,000	2.0%	Yes	\$ 3,000
Booster Pump #1-4	Aurora Series 340/360 7.5 HP	1999	15	4	2	-5	\$ 3,000	4	EA	\$ 12,000	2.0%	Yes	\$ 12,000
Booster Pump Controls		1999	15	3	2	-5	\$ 10,000	1	LS	\$ 10,000	2.0%	Yes	\$ 10,000
Distribution System Piping*	8" PVC	1997	50	2	5	28	\$ 160	567	LF	\$ 90,720	2.0%	No	\$ 157,946
Distribution System Piping*	6 & 8" DI	1958	50	3	5	-11	\$ 200	1,252	LF	\$ 250,400	2.0%	Yes	\$ 250,400

Distribution System Piping*	6" PVC	1996	50	3	2	27	\$ 150	9,212	LF	\$ 1,381,800	2.0%	No	\$ 2,358,576
Distribution System Piping*	6" AC	1958	50	3	5	-11	\$ 200	9,755	LF	\$ 1,951,000	2.0%	Yes	\$ 1,951,000
Distribution System Piping*	4" PVC	1997	50	2	2	28	\$ 120	8,695	LF	\$ 1,043,400	2.0%	No	\$ 1,816,585
Distribution System Piping*	2/2.5 other	1958	50	2	5	-11	\$ 100	6,636	LF	\$ 663,600	2.0%	Yes	\$ 663,600
Dedicated Fill Line Piping	6" PVC	1997	50	1	1	28	\$ 150	3,135	LF	\$ 470,250	2.0%	No	\$ 818,717
Hydrants*		1980	50	3	4 / 5	11	\$ 5,000	20	EA	\$ 100,000	2.0%	No	\$ 124,337
Gate Valves*		1980	20	2	4 / 5	-19	\$ 2,500	70	EA	\$ 175,000	2.0%	Yes	\$ 175,000
Air-release Valves*		1980	20	2	4 / 5	-19	\$ 3,000	18	EA	\$ 54,000	2.0%	Yes	\$ 54,000
Blow-offs*		1980	20	2	4 / 5	-19	\$ 3,000	14	EA	\$ 42,000	2.0%	Yes	\$ 42,000
Pressure Reducing Valve Stations	Fidalgo PRV Station:	1980	20	3	2	-19	\$ 40,000	1	EA	\$ 40,000	2.0%	Yes	\$ 40,000
	Fidalgo/George PRV Station:	1980	20	3	2	-19	\$ 40,000	1	EA	\$ 40,000	2.0%	Yes	\$ 40,000
	Driftwood Drive PRV Station:	2007	20	1	2	8	\$ 40,000	1	EA	\$ 40,000	2.0%	No	\$ 46,866
Service meters		1980	15	Varies	4 / 5	-24	\$ 200	410	EA	\$ 82,000	2.0%	Yes	\$ 82,000
Generator		1980	50	2	3	11	\$ 6,000		EA	\$ -	2.0%	No	\$ -
Propane Tank		1980	30	2	3	-9	\$ 2,000		EA	\$ -	2.0%	Yes	\$0
Pumphouse		1980	75	3	3	36	\$ 200	1,125	SF	\$ 225,000	2.0%	No	\$ 458,975
Facility Maintenance		1980	50	n/a		11	\$ 2,000	6	Year	\$ 12,000		No	\$ 12,000

*From 1998 WSP

Major Anticipated Projects

- Treatment System Replacement
- Old Water Main Replacement
- 2nd Line to Beach
- Looping Periwinkle to George
- Expansion West

Total Cost Estimate for 6-year \$10,329,758

Scatchet Head Water District - Capital Improvement Projects

Project Discription		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031-2035	2036-2040	Total Expenditure
1.	Watermain Replacement - Easement west of Samish Cout (450-ft)	\$30,000	\$30,000	\$30,000											\$90,000
2.	Repair Pumphouse Piping at Guems Reservoir	\$17,750	\$22,250												\$40,000
3.	Repair/Install connection at George Dr and Fildalgo Dr		\$5,000												\$5,000
4.	Replace old water meters (5% per year)	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000			\$66,000
5.	Watermain Replacment - Easement west of Samish Cout (450-ft)		\$5,000	\$5,000											\$10,000
6.	Water Rights Transfer (Well 1 to Well 2/3)		\$5,000	\$5,000											\$10,000
7.	Watermain Replacement - Hubble to Driftwood to George			\$40,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000			\$400,000
8.	Water Rate Analysis				\$7,500										\$7,500
9.	Treatment System Analysis & Replacement				\$10,000	\$10,000	\$10,000	\$10,000	\$10,000						\$50,000
10.	System Loop - George Dr & Periwinkle Road				\$10,000	\$10,000	\$10,000	\$10,000	\$10,000						\$50,000
11.	Watermain Replacement - George Drive Gravity Main				\$21,500	\$39,000	\$39,000	\$39,000	\$39,000	\$39,000	\$39,000	\$39,000	\$195,000	\$90,500	\$580,000
12.	Well Pump Generator									\$10,000					\$10,000
13.	Dynamic and Static Analysis of Wells									\$10,000	\$10,000	\$5,000			\$25,000
14.	Alternative Well Analysis & Development										\$10,000	\$15,000	\$35,000		\$60,000
15.	Treatment System Piping Configuration												\$15,000		\$15,000
16.	Maple Point Reservoir Control Extension												\$175,000	\$175,000	\$350,000
17.	Watermain Replacment - Lopez Dr, Orcas Dr, Fidalgo Dr												\$130,000	\$465,000	\$595,000
18.	SCADA System Installation													\$100,000	\$100,000
Yearly Expenditure		\$53,750	\$73,250	\$86,000	\$100,000	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000	\$550,000	\$830,500	

APPENDIX P Water System Financial Information

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Scatchet Head Water District
Balance Sheet Prev Year Comparison
As of April 30, 2019



	<u>Apr 30, 19</u>	<u>Apr 30, 18</u>	<u>\$ Change</u>
ASSETS			
Current Assets			
Checking/Savings			
BANK - Cash	42,657.70	61,866.59	-19,208.89
Total Checking/Savings	<u>42,657.70</u>	<u>61,866.59</u>	<u>-19,208.89</u>
Total Current Assets	<u>42,657.70</u>	<u>61,866.59</u>	<u>-19,208.89</u>
TOTAL ASSETS	<u>42,657.70</u>	<u>61,866.59</u>	<u>-19,208.89</u>
LIABILITIES & EQUITY			
Liabilities			
Current Liabilities			
Other Current Liabilities			
Payroll Liabilities	-41.38	-47.97	6.59
Total Other Current Liabilities	<u>-41.38</u>	<u>-47.97</u>	<u>6.59</u>
Total Current Liabilities	<u>-41.38</u>	<u>-47.97</u>	<u>6.59</u>
Total Liabilities	<u>-41.38</u>	<u>-47.97</u>	<u>6.59</u>
Equity			
Transfer to Reserve Account	-50,000.00	-50,000.00	0.00
Opening Bal Equity	29,021.80	29,021.80	0.00
Retained Earnings	74,125.68	87,136.35	-13,010.67
Net Income	<u>-10,448.40</u>	<u>-4,243.59</u>	<u>-6,204.81</u>
Total Equity	<u>42,699.08</u>	<u>61,914.56</u>	<u>-19,215.48</u>
TOTAL LIABILITIES & EQUITY	<u>42,657.70</u>	<u>61,866.59</u>	<u>-19,208.89</u>

Scatchet Head Water District
Profit & Loss Prev Year Comparison
April 2019

2

	Apr 19	Apr 18	\$ Change
Ordinary Income/Expense			
Income			
INCOME			
Water Fees	5,885.02	6,399.89	-714.87
Late Fees	5.30	0.90	4.40
Reimbursed Expenses	163.00	0.00	163.00
Total INCOME	5,853.32	6,400.79	-547.47
Total Income	5,853.32	6,400.79	-547.47
Expense			
EXPENSES			
DIRECT SALARIES & WAGES			
Manager Salary	600.00	600.00	0.00
Commissioners Pay	384.00	342.00	42.00
Payroll Expenses	164.63	176.27	-11.64
Total DIRECT SALARIES & WAGES	1,148.63	1,118.27	30.36
WATER MAINTENANCE			
Water Management	1,100.00	1,100.00	0.00
Water Repairs & Maintenance	389.12	3,149.53	-2,760.41
Water Testing	558.00	30.00	528.00
Chlorine and Chemicals	206.12	257.65	-51.53
Flushing	1,565.82	0.00	1,565.82
Total WATER MAINTENANCE	3,819.06	4,537.18	-718.12
Freedom of Information Response			
King Water Company	412.52	0.00	412.52
Davido Consulting	1,133.00	0.00	1,133.00
Total Freedom of Information Response	1,545.52	0.00	1,545.52
Dues and Subscriptions	200.00	0.00	200.00
Island County NSF Check Fee	80.00	0.00	80.00
Licenses and Permits	0.00	403.76	-403.76
Total EXPENSES	6,793.21	6,059.21	734.00
Postage and Delivery			
Certified Letter Fees	130.44	0.00	130.44
Total Postage and Delivery	130.44	0.00	130.44
Professional Fees			
Engineering	3,538.50	260.00	3,278.50
Accounting	848.00	848.00	0.00
Subcontractor/maintenance	652.20	0.00	652.20
Total Professional Fees	5,038.70	1,108.00	3,930.70
Taxes			
State Utility Tax	1,136.05	1,191.37	-55.32
Total Taxes	1,136.05	1,191.37	-55.32
Telephone	17.87	17.87	0.00
Utilities			
Electric	1,031.76	1,043.89	-12.13

Scatchet Head Water District
Profit & Loss Prev Year Comparison
April 2019

3

	<u>Apr 19</u>	<u>Apr 18</u>	<u>\$ Change</u>
Total Utilities	1,031.76	1,043.89	-12.13
Total Expense	14,148.03	9,420.34	4,727.69
Net Ordinary Income	-8,294.71	-3,019.55	-5,275.16
Net Income	-8,294.71	-3,019.55	-5,275.16

Scatchet Head Water District
Profit & Loss Prev Year Comparison
January through April 2019

4

	Jan - Apr 19	Jan - Apr 18	\$ Change
Ordinary Income/Expense			
Income			
INCOME			
Water Fees	40,308.89	34,925.84	5,383.05
Late Fees	203.58	42.16	161.42
Reimbursed Expenses	1,102.00	480.00	642.00
Total INCOME	41,614.47	35,428.00	6,186.47
Total Income	41,614.47	35,428.00	6,186.47
Expense			
Transfer to Bond Fund	11,250.00	11,250.00	0.00
EXPENSES			
DIRECT SALARIES & WAGES			
Manager Salary	2,400.00	2,400.00	0.00
Commissioners Pay	1,536.00	1,596.00	-60.00
Meter Reading	200.00	150.00	50.00
Payroll Expenses	453.13	466.02	-12.89
Total DIRECT SALARIES & WAGES	4,589.13	4,612.02	-22.89
WATER MAINTENANCE			
Water Management	4,400.00	4,258.00	142.00
Water Repairs & Maintenance	1,340.20	5,966.63	-4,626.43
Water Testing	978.00	155.00	823.00
Chlorine and Chemicals	1,122.48	631.81	490.67
Flushing	1,565.82	0.00	1,565.82
Total WATER MAINTENANCE	9,406.50	11,011.44	-1,604.94
Freedom of Information Response			
King Water Company	1,453.86	0.00	1,453.86
Attorney Fees	6,496.00	0.00	6,496.00
Davido Consulting	1,133.00	0.00	1,133.00
Total Freedom of Information Response	9,082.86	0.00	9,082.86
Dues and Subscriptions	432.40	416.21	16.19
Island County NSF Check Fee	160.00	0.00	160.00
Licenses and Permits	0.00	478.76	-478.76
Total EXPENSES	23,670.89	16,518.43	7,152.46
Postage and Delivery			
Billing Cards And Stamps	406.02	383.95	22.07
Certified Letter Fees	586.98	456.54	130.44
Mailings	425.04	618.27	-193.23
Total Postage and Delivery	1,418.04	1,458.76	-40.72
Lien Filing Fees	108.70	81.53	27.17
Professional Fees			
Engineering	4,544.18	260.00	4,284.18
Accounting	3,392.00	3,296.00	96.00
Subcontractor/maintenance	652.20	0.00	652.20
Total Professional Fees	8,588.38	3,556.00	5,032.38

Scatchet Head Water District
Profit & Loss Prev Year Comparison
January through April 2019

5

	<u>Jan - Apr 19</u>	<u>Jan - Apr 18</u>	<u>\$ Change</u>
Taxes			
State Utility Tax	2,508.97	2,478.17	28.80
Property	78.26	78.26	0.00
Total Taxes	<u>2,585.23</u>	<u>2,556.43</u>	<u>28.80</u>
Telephone	71.48	71.48	0.00
Utilities			
Propane	212.63	0.00	212.63
Electric	4,157.52	4,178.96	-21.44
Total Utilities	<u>4,370.15</u>	<u>4,178.96</u>	<u>191.19</u>
Total Expense	<u>52,062.87</u>	<u>39,671.59</u>	<u>12,391.28</u>
Net Ordinary Income	<u>-10,448.40</u>	<u>-4,243.59</u>	<u>-6,204.81</u>
Net Income	<u>-10,448.40</u>	<u>-4,243.59</u>	<u>-6,204.81</u>

Scatchet Water District Bond Fund
Balance Sheet Prev Year Comparison
As of April 30, 2019

6

	<u>Apr 30, 19</u>	<u>Apr 30, 18</u>	<u>\$ Change</u>
ASSETS			
Current Assets			
Checking/Savings			
Scatchet Water Dist Bond Fund	69,812.70	45,000.00	24,812.70
Total Checking/Savings	<u>69,812.70</u>	<u>45,000.00</u>	<u>24,812.70</u>
Total Current Assets	<u>69,812.70</u>	<u>45,000.00</u>	<u>24,812.70</u>
TOTAL ASSETS	<u>69,812.70</u>	<u>45,000.00</u>	<u>24,812.70</u>
LIABILITIES & EQUITY			
Liabilities			
Long Term Liabilities			
Public Works Loan	19,410.86	38,821.73	-19,410.87
Total Long Term Liabilities	<u>19,410.86</u>	<u>38,821.73</u>	<u>-19,410.87</u>
Total Liabilities	<u>19,410.86</u>	<u>38,821.73</u>	<u>-19,410.87</u>
Equity			
Opening Bal Equity	-442,033.03	-442,033.03	0.00
Retained Earnings	481,184.87	436,961.30	44,223.57
Net Income	11,250.00	11,250.00	0.00
Total Equity	<u>50,401.84</u>	<u>6,178.27</u>	<u>44,223.57</u>
TOTAL LIABILITIES & EQUITY	<u>69,812.70</u>	<u>45,000.00</u>	<u>24,812.70</u>

Scatchet Water District Bond Fund
Profit & Loss Prev Year Comparison
January through April 2019

7

	<u>Jan - Apr 19</u>	<u>Jan - Apr 18</u>	<u>\$ Change</u>
Ordinary Income/Expense			
Income			
Transfer	11,250.00	11,250.00	0.00
Total Income	<u>11,250.00</u>	<u>11,250.00</u>	<u>0.00</u>
Net Ordinary Income	<u>11,250.00</u>	<u>11,250.00</u>	<u>0.00</u>
Net Income	<u>11,250.00</u>	<u>11,250.00</u>	<u>0.00</u>

**Scatchet Head Tank Reserve and Emergency Fund
 Balance Sheet Prev Year Comparison
 As of April 30, 2019**



	<u>Apr 30, 19</u>	<u>Apr 30, 18</u>	<u>\$ Change</u>
ASSETS			
Current Assets			
Checking/Savings			
Tank Refurbishment & Emerg Fund	33,052.05	52,223.43	-19,171.38
Total Checking/Savings	<u>33,052.05</u>	<u>52,223.43</u>	<u>-19,171.38</u>
Total Current Assets	<u>33,052.05</u>	<u>52,223.43</u>	<u>-19,171.38</u>
TOTAL ASSETS	<u>33,052.05</u>	<u>52,223.43</u>	<u>-19,171.38</u>
LIABILITIES & EQUITY			
Equity			
Transfer from Maintenance Fund	50,000.00	50,000.00	0.00
Opening Bal Equity	30,134.91	30,134.91	0.00
Retained Earnings	-52,082.86	133,239.98	-185,372.84
Net Income	5,000.00	-161,201.46	166,201.46
Total Equity	<u>33,052.05</u>	<u>52,223.43</u>	<u>-19,171.38</u>
TOTAL LIABILITIES & EQUITY	<u>33,052.05</u>	<u>52,223.43</u>	<u>-19,171.38</u>

Scatchet Head Tank Reserve and Emergency Fund
Profit & Loss Prev Year Comparison
January through April 2019

9

	<u>Jan - Apr 19</u>	<u>Jan - Apr 18</u>	<u>\$ Change</u>
Ordinary Income/Expense			
Income			
Hook up Fees	5,000.00	5,000.00	0.00
Total Income	<u>5,000.00</u>	<u>5,000.00</u>	<u>0.00</u>
Expense			
Repairs			
Storage Tank Repairs	0.00	166,201.46	-166,201.46
Total Repairs	<u>0.00</u>	<u>166,201.46</u>	<u>-166,201.46</u>
Total Expense	<u>0.00</u>	<u>166,201.46</u>	<u>-166,201.46</u>
Net Ordinary Income	<u>5,000.00</u>	<u>-161,201.46</u>	<u>166,201.46</u>
Net Income	<u>5,000.00</u>	<u>-161,201.46</u>	<u>166,201.46</u>

APPENDIX Q DOH Sanitary Survey

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STATE OF WASHINGTON
DEPARTMENT OF HEALTH
NORTHWEST DRINKING WATER REGIONAL OPERATIONS
20525 72nd Ave South, Suite 310, Kent, WA 98032-2388
TDD Relay 1-800-833-6388

May 22, 2015 Edward Schoeler 7906 Guemes Ave Clinton, Wa 98236	Scatchet Head Water District ID #76470	
	County:	Island
	System Type:	Community
	Operating Permit Color:	Green
	Surveyors:	Virpi Salo-Zieman Derek Pell
	Inspection Date:	May 19,2015

Dear Mr Schoeler,

I met with Clive Defty and Sandra Bodamer from King Water to conduct a survey of your water system on May 19, 2015. Sanitary surveys are the Office of Drinking Water's (ODW) way to inspect public water systems through a field visit. ODW is also able to offer technical assistance to help utilities improve their system operations and ensure that public health is protected.

This report documents the findings of this survey and deficiencies that need your attention are summarized below. **I would appreciate a response by July 24, 2015, in which you describe how you will address each item or provide documentation such as pictures that demonstrates them completed.** If you are not able to correct them within the timelines below, please submit an Action Plan describing how and when the work will be completed.

SIGNIFICANT DEFICIENCIES* - COMPLETE THE ITEMS BELOW BY JULY 24, 2015

1. Install screens to the air inlet of the well 2 Mazzei injector.

SIGNIFICANT FINDINGS - COMPLETE THE ITEMS BELOW BY JULY 24, 2015**

2. Provide pictures on the reservoir hatches showing the hatch structure and seal and vents showing the vents structure and screening. Also, provide pictures on any other openings on top of the reservoir to demonstrate them adequately protected.

OBSERVATIONS

3. The overflow of the 300K tank appeared to have a PVC solid cap on it. This should have a screen, flapper valve, or something else that would provide sanitary protection of the reservoir but would also allow flow if needed.
4. Install screens to the outlets of the air-vacuum release valves in the pump house.
5. Fix the leak at the backwash discharge line at the backwash bond.

6. The 300K standpipe at the treatment plant site is in need of structural inspection and external painting. The surface showed rust spots. Please hire professionals to inspect the reservoir and evaluate the level of work that is needed to sustain the reservoir in use.
7. Develop and implement a cross connection control program. Start by making sure you have the authority established for implementing the program, then complete a hazards assessment, create a list of installed devices, ensure adequate protection is installed, and that the installed devices are tested annually as required.
8. Treatment bypass should not exist. While only the chlorination is required, the treatment that has been installed is required to remain in use. You should lock and tag the bypass valve to avoid inadvertent bypassing of the treatment.

RECOMMENDATIONS

9. You should add a pressure relief valve near the hydropneumatic tank at the pump station to protect from overpressurization. The small valve included in the pump station piping did not appear adequate for the size of the tank.
10. While this system is required to continue quarterly monitoring of arsenic at the entry point to the distribution system, you should consider taking monthly samples when the high-arsenic source is in use to demonstrate the blending is efficient mitigation method.
11. Revise the monthly report submitted to our office to accurately reflect the monitoring completed at the system.
12. During the site visit, the backwash water appeared very clear. You should investigate if the backwash flow rate is adequate or if the frequency could be reduced.
13. You should start long-range planning of the water system, especially considering the age of your assets and their replacement value. You should update your water system plan to make sure it provides you a useful tool in managing the assets and other aspects of your water system.
14. We would like you to complete an online capacity assessment survey. The assessment includes 18 questions about your system. When you complete the online assessment, you'll get immediate feedback that provides tips and resources for improvement. We are using information from the assessment to target our limited technical assistance resources where we think they will be most beneficial. You can find the assessment at www.doh.wa.gov/capacityassessment.aspx.

SYSTEM INFORMATION

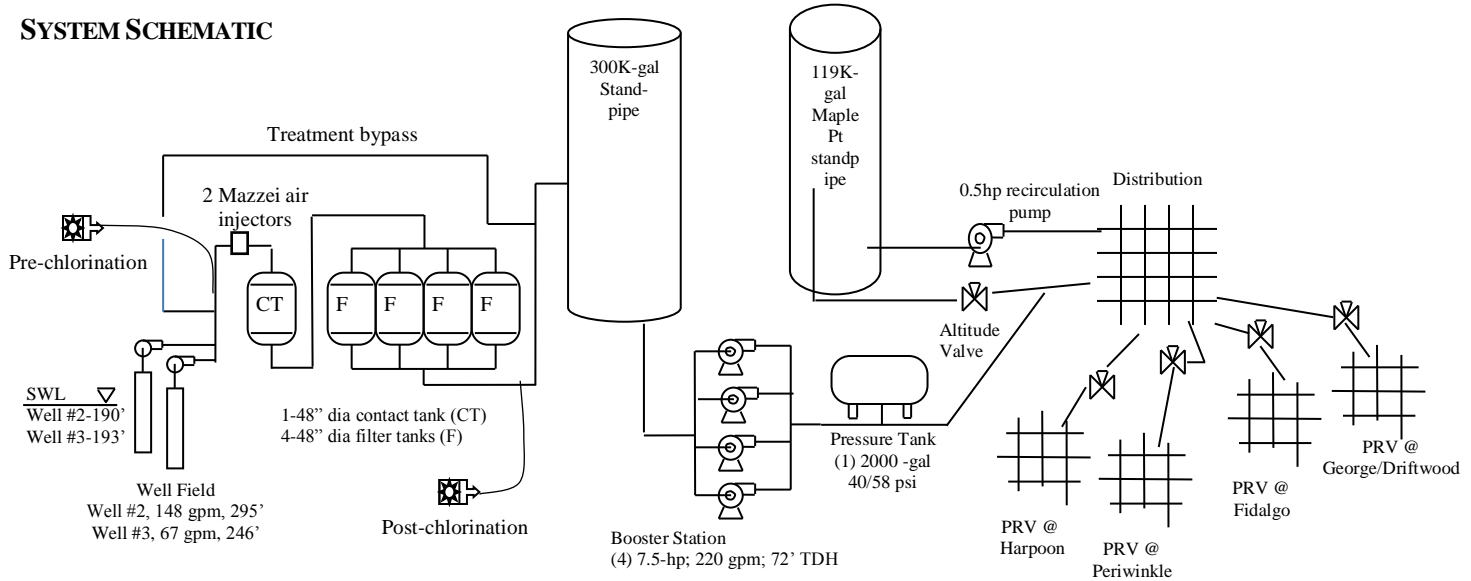
Scatchet Head Water District is a medium size water system in South Whidbey that serves 410 homes and 900 people on a daily basis. The system is approved for 451 connections. The water system plan was approved in 1999.

This water system has two wells that are treated to remove iron and manganese. The treatment includes pre-chlorination and air injection for oxidation followed by BIRM filtration and post chlorination. The well 3 exceeds the arsenic standard and therefore, is only used seasonally to supplement the demand. This system is also required to disinfect to maintain adequate water quality in the distribution system. A schematic of the system is presented below.

In general, the water system is currently working fine, but is aging and is vulnerable since you rely mostly on a single source. You will need to invest in your infrastructure to sustain it. I encourage you to evaluate your assets and begin planning their replacement. All systems are facing aging infrastructure replacement costs and

understanding the needs for capital improvements and being able to plan ahead are critical for successful and sustainable water systems. I would like you to contact our planner Jennifer Kropack and ask her help in evaluating the level of update you would need to your 1999 water system plan considering your future plans and needs. A current water system plan is required for instance, if you were to apply for State Revolving Fund loan for your infrastructure projects.

SYSTEM SCHEMATIC



SECTION 1: SOURCE

Source ID #	Name:	Description:
02	Well 2 ABR417	150gpm, main source for the system; 10" casing, 295ft deep, first open interval at 231ft, located inside the pump house.
03	Well 3 ABN832	Seasonal source, supplies 80gpm, 8" well casing, 403ft deep, screened at 242ft, located inside the fenced area on a concrete block with a plastic cover.
04	Wellfield of the wells 2 and 3	

WELLHEAD	Source ID #02		Source ID #03	
	Yes	No	Yes	No
System has well log	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
*Wellcap sealed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*Openings sealed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*Vent screened	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Terminates 6" above grade	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*Protected from flooding	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Source meter	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

WELLHEAD	Source ID #02		Source ID #03	
	Yes	No	Yes	No
Pressure gauge	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
**Raw water sample tap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Check valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
**Protected from unauthorized access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Structure in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*Sanitary control area has no unmitigated contaminants	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
**Protected from physical damage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Frequency of routine site visit	3 times a week		3 times a week	
Frequency of source meter reading	weekly		weekly	

The County road is within the sanitary control area of the wells. The wells are relatively deep, but you should still talk to the county to discourage spraying of chemicals at the roadside by your wells.

WELL PUMP EQUIPMENT	Source ID #02		Source ID #03	
	Yes	No	Yes	No
*Functional and reliable pump and pump controls	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*Pump control valve or vacuum relief valve with a protected air gap at discharge	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Generator available	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Generator has automatic startup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generator fuel source				

Emergency Sources: This system does not have emergency sources.

SECTION 2: DISINFECTION

The disinfection has been required due to repeated coliform failures in the distribution system. Chlorine is added in two places, prior to filtration and then after the filtration. The chlorine residual is typically 0.2-0.3mg/L after the filtration and it is dosed to 2mg/L before reservoir. After reservoir, the residual is typically around 0.7mg/L, which has meant a trace throughout the distribution system. Chlorine demand appears high for the system after treatment.

The monthly report submitted to our office includes one of the chlorination treatments and shows high and low residuals measured. You should mark it as post-filter chlorine treatment (the required treatment) and replace the

high with entry point or reservoir and the low with distribution residual (if this is what you are doing). Even better would be to include information for both chlorine additions and your results for iron and manganese testing.

#	Site or Location	Treatment type and Chemical Used
1	Prefilter	Sodium hypochlorite, oxidation, dose around 1.5-2mg/L
2	After filtration	Sodium hypochlorite, disinfection of the distribution system

CHEMICAL TREATMENT	1 & 2	
	Yes	No
*Operated & maintained properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*RPBA or air gap between the chemical tank and fill waterline	<input checked="" type="checkbox"/>	<input type="checkbox"/>
**Post treatment sample tap	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Redundant equipment available	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schematic of treatment facilities available	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Adequate chlorine residual test kit available	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Test kit calibrated and maintained properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Chemical feed proportional to flow	<input checked="" type="checkbox"/>	<input type="checkbox"/>
**Approved chemicals used	<input checked="" type="checkbox"/>	<input type="checkbox"/>

HYPOCHLORITE ADDITION	1		2	
	Yes	No	Yes	No
Hypochlorite concentration %	12.5		12.5	
Feed solution concentration	6.25%		6.25%	
Hypochlorite solution located in separate room	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

DISINFECTION COMPLIANCE	1&2	
	Yes	No
Disinfection required	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CT required	<input type="checkbox"/>	<input checked="" type="checkbox"/>
**Minimum CT met at all times	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Peak flow used to calculate CT	<input type="checkbox"/>	<input type="checkbox"/>
**Monthly report submitted	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Residuals maintained in distribution system	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Daily residuals recorded	<input type="checkbox"/>	<input checked="" type="checkbox"/>

SECTION 3: OTHER TREATMENTS

BIRM filtration treatment to remove iron and manganese from the water. The oxidation is with both chlorine and air. Chlorine is added to the common pipe coming from the well site. Then the line splits into two parallel lines for air suction through two mazes. One is used for each well. It is unclear if the air suction adds any

benefit. After that the lines combine and water enters to the about 250-gallon contact tank which is followed by four parallel filter units. The backwash frequency is once every 37,000gallons of treated water. Backwash water is lead to the lagoon right outside the treatment building from where it is pumped to sprinklers installed on top of the ground next to the lagoon. A backwash happened during the survey and water coming out from the filters appeared clear.

#	Treatment Process	Chemical Added	Purpose	On WFI	
				Yes	No*
1	Air injection followed by BIRM filtration	Air	Iron and manganese removal	<input checked="" type="checkbox"/>	<input type="checkbox"/>

TREATMENT	1	
	Yes	No
*Operated & maintained properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*RPBA or air gap at water fill line to chemical tank	<input checked="" type="checkbox"/>	<input type="checkbox"/>
**Post treatment sample tap	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Redundant equipment available	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Schematic of treatment facilities available	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Adequate testing equipment available and used	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Test kit calibrated and maintained properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Chemical feed proportional to flow	<input checked="" type="checkbox"/>	<input type="checkbox"/>
**Approved chemicals used	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Please screen the air inlet of the Mazzei injector.

Manganese samples have been collected after the reservoir at the entry point to the system. While this is good for compliance sampling and evaluating the water quality that is served to the customers, you should also check the removal across the filters to ensure those are effectively removing the contaminant instead of them being precipitated in the system’s reservoir. The manganese levels have remained consistently below the MCL of 0.05 mg/L. Most of the time, the level is half of that.

SECTION 4: DISTRIBUTION SYSTEM

The distribution is AC or PVC pipe mostly 6” in size but includes some 4” and smaller pipes. The system provides fire flow at 500gpm. According to the 1999 WSP, each PRV in the system supplies a separate linear distribution system but the main zone is pretty well looped. Additional PRVs have been installed since the plan which may have improved the water flow. Only the PRV at Driftwood/George was visited during the survey. This vault appeared in great condition and had a drain to daylight.

The customer meters are read once a quarter. The meter reads a compared with the source meter reads to evaluate system leakage.

FEATURES	Yes	No
Service area and facility map	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimum pressure requirements met	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Service meters (reading frequency <u>quarterly</u>)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Leak detection program	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water system leakage (%)	10.6	
Adequate valving for flushing and pipe repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Blow-offs on dead ends	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Routine flushing (frequency <u>annually</u>)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Routine valve exercise (frequency <u>annually</u>)	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CROSS CONNECTION CONTROL (Community Systems)	Yes	No
System has enabling authority	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ongoing hazard inspections	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High hazards identified	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High hazards protected	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Annual testing	<input type="checkbox"/>	<input checked="" type="checkbox"/>
System has installation standards	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CCS on staff or under contract	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cross connections observed have been eliminated	<input checked="" type="checkbox"/>	<input type="checkbox"/>

This system does not have an active cross connection control program. **There may not be any high hazard connections, but the system needs to evaluate if they have authority to implement a program, begin by doing a hazards assessment and list of installed devices, and then begin implementing testing and installation of the devices.**

SECTION 5: FINISHED WATER STORAGE

#	RESERVOIR NAME	DESCRIPTION	TOTAL VOLUME (GAL)
1	Guemes Ave Reservoir	85ft high bolted steel tank at the treatment plant site. Not seismically sound. Shows external rust marks. Needs to be evaluated for structural integrity and painted if possible.	300,000
2	Maple St standpipe	Very tall and skinny tank. 30d water age. Turnover is forced by 7gpm recirculation pump that is on 12 hours/ day supplying water from this reservoir to the distribution system. The reservoir inlet has an altitude valve. Drain line is down the hill in the forested area and has a flapper and a screen.	

TOP OF RESERVOIR	Res #1		Res #2	
	Yes	No	Yes	No
Hatch: Locked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
*Hatch: Watertight seal or gasket	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hatch: Over-lapping cover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
*Screened air vent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
*Openings sealed/protected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please provide pictures on the reservoir hatches and vents to demonstrate adequate sanitary protection.

FEATURES	Res #1		Res #2	
	Yes	No	Yes	No
Separate inlet/outlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Protected drain outlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*Protected overflow outlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*Overflow line discharges into a sanitary sewer with an air gap	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Operational water level gauge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Bypass piping or isolation possibility	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
**Protected from unauthorized entry	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Low level alarms	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sample tap at outlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The overflow of the 300K reservoir appeared to have a PVC cap, which would not allow overflow if needed. **You should change this to a screen, flapper valve or provide sanitary protection by other means while also having a functioning overflow.**

A small rip was observed in the screen at the Maple St reservoir's drainline. **You should replace this screen if considered needed with the flapper valve.**

MAINTENANCE	Res #1		Res #2	
	Yes	No	Yes	No
Frequency of structural and coating inspection	never/5yrs		never/5yrs	
Frequency of cleaning	5 yrs		5 yrs	
Frequency of appurtenance inspection	5 yrs		5 yrs	
Frequency of routine site visit	weekly		weekly	
**Structure in good condition	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Clear of excessive vegetation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The reservoirs are cleaned by divers on a five-year schedule. The diving company does evaluate the internal coating of the reservoir, but the reservoir at the treatment plant site is in need of structural evaluation and external painting. The need for internal coating at the same time will greatly depend on the level of work that needs to be completed to address the rust spots. **You need to get this reservoir inspected by professionals that can evaluate the level of work that is needed to sustain the reservoir in operating condition.**

SECTION 6: PRESSURE TANKS

Site	Location	# and size of Hydropneumatic Tanks	# and size of Bladder Tanks
1	Booster pumps at reservoir site	2000-gallon tank	
2	Maple St recirculation pump		60-gal tank

HYDROPNEUMATIC	Site: 1	
	Yes	No
Pressure relief valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pressure gauge	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water level sight glass	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Can be isolated	<input checked="" type="checkbox"/>	<input type="checkbox"/>
**Oilless Air compressor	<input checked="" type="checkbox"/>	<input type="checkbox"/>
**Structurally in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>

You should add a pressure relief valve near the hydropneumatic tank to protect from overpressurization of the system. The small valve include in the pump station piping does not appear large enough for the size of this tank.

BLADDER	Site: 2	
	Yes	No
Isolation valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pressure relief valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pressure gauge	<input checked="" type="checkbox"/>	<input type="checkbox"/>
In good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>

BUILDINGS/ENCLOSURE	Site: 1		Site: 2	
	Yes	No	Yes	No
Facility secure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Structure in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

SECTION 7: BOOSTER PUMPS AND FACILITIES

Facility	Name	Description	Total Capacity (gpm)
1	Booster pumps	Four 7.5hp pumps that alternate, provides water to the whole system.	
2	Maple St reservoir recirculation pump	7gpm 0.5hp pump that transfer water from the reservoir into the distribution system. The purpose is to turn over the water in the otherwise stagnant Maple St tank. Located in a pump house next to the Maple St reservoir. Operated on a timer 12 hours a day.	7gpm

BOOSTER PUMPS	Facility 1		Facility 2	
	Yes	No	Yes	No
Number of pumps	4		1	
Frequency of routine site visit	3x/week		3x/week	
Isolation valves	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pressure gauge(s)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pressure relief valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pump failure alarm	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
*Functional pump and pump controls	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Protected from flooding	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Redundant pumps	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Equipment in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Generator available	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Generator has automatic startup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Generator fuel source	propane			

BUILDINGS/ENCLOSURE	Facility 1		Facility 2	
	Yes	No	Yes	No
Facility secure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Structure in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Please screen the outlets of the air-vacuum release valve assemblies inside the pump house.

SECTION 8: WATER QUALITY MONITORING AND REPORTING

This system has elevated arsenic at the source 3 which is mitigated by seasonal use of the source and blending it. The system has occasionally exceeded the 10ppb standard, but so far the running annual average has remained below the MCL. **While this system is required to continue quarterly monitoring of arsenic at the entry point to the distribution system, you should consider taking monthly tests when the high-arsenic source is in use to demonstrate the blending is efficient mitigation method.**

Additionally, this system has high iron and manganese at the source. The treatment has been efficient in removing manganese and is likely also removing iron.

This system has also exceeded the MCL for Trihalomethanes in the past, but the latest samples have been satisfactory and well below the regulatory limit.

Refer to the Water Quality Monitoring Schedule for your monitoring requirements and status. If you have any questions on source monitoring, please contact Steve Hulsman at (253) 395-6777.

CHEMICAL	
Sample Point	Description
1	After reservoir at the entry point to the distribution system.

CHEMICAL	Sample Point 1	
	Yes	No
Monitoring adequate	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ODW WQ data reviewed	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sample collection sites correct	<input checked="" type="checkbox"/>	<input type="checkbox"/>
System has prior: <input type="checkbox"/> Nitrate results above 5 mg/L <input type="checkbox"/> Nitrite results above 0.5 mg/L <input checked="" type="checkbox"/> Primary MCL <input checked="" type="checkbox"/> Secondary MCL exceedance(s) <input type="checkbox"/> Organic detections <input type="checkbox"/> Other _____		

COLIFORM	Yes	No
Monitoring adequate	<input type="checkbox"/>	<input type="checkbox"/>
Monitoring plan adequate	<input type="checkbox"/>	<input type="checkbox"/>
Monitoring plan followed	<input type="checkbox"/>	<input type="checkbox"/>
# of violations since last survey	none	

This system has sampling stations installed in the distribution system. **You should make sure the sampling stations are adequately representing the whole distribution system especially considering the multiple separate pressure zones.**

LEAD & COPPER	Yes	No
Monitoring adequate	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Results below action level	<input checked="" type="checkbox"/>	<input type="checkbox"/>

DISINFECTION BYPRODUCTS	Yes	No
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Monitoring adequate	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Monitoring plan adequate	<input type="checkbox"/>	<input type="checkbox"/>
Monitoring plan followed	<input type="checkbox"/>	<input type="checkbox"/>
Results satisfactory	<input checked="" type="checkbox"/>	<input type="checkbox"/>

You are required to have a disinfection byproducts monitoring plan. If you do not have one yet under the stage II rule, you can use our template available in our forms website at:
<http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/PublicationsandForms/Forms#disinfbyprod>.

SECTION 9: SYSTEM MANAGEMENT AND OPERATIONS

The water district is governed by an elected board. The board has remained the same over the years and reportedly, is engaged and knowledgeable of the water system. However, I am concerned over long-range planning of the water system and the board’s ability to recruit more active members. It is apparent that this system will need to invest in maintaining their water system infrastructure and will likely be facing significant replacement costs in the future. You need to start planning for those so that you can be prepared and make sure your rates will cover the financing of the infrastructure replacement.

King Water has provided their SMA services for this system for long time, also providing good longevity for system operations and maintenance.

PROJECT/PLANNING	Yes	No
System approved	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Current WSP/SWSMP	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Year WSP/SWSMP approved	1999	
Emergency response plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If you will expand your service area, increase the physical capacity of the water system, or need funding from our State Revolving Fund program to replace the infrastructure, you will be required to submit an updated water system plan for our review and approval.

REPORTING	Yes	No	N/A
WFI reviewed and updated with purveyor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	---
Consumer confidence report (Community only)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online Capacity Assessment Survey completed (Community only <1000 connection)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water use efficiency report (Municipal Water Suppliers)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cross connection control annual report (> 1000 conn)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

OPERATOR CERTIFICATION

This system is required to have WDM1 and WTPO1-level certified operators. King Water has been under contract to meet these requirements. If you have any questions or this information is inaccurate, please contact Operator Certification at (800) 525-2536.

Name of Operator	Certification Number	Certifications	Mandatory Operator
Clive Defty	010126	WDM2, WTPO2, CCS, BTO	<input type="checkbox"/>

WDS-Water Distribution Specialist; WDM-Water Distribution Manager; WTPO-Water Treatment Plant Operator, BTO-Basic Treatment Operator; CCS-Cross Connection Specialist; BAT-Backflow Assembly Tester

OPERATIONS	Yes	No
Operational records maintained	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Complaints followed up	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Complaints documented	<input checked="" type="checkbox"/>	<input type="checkbox"/>
# of complaints recorded at ODW (since last survey)	0	
Operation and maintenance program	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Previous survey deficiencies/findings corrected, if no list below.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The last survey also pointed out the need to develop and implement a cross connection control program. The other item identified was the need to be prepared for emergencies.

CLOSING

This system can qualify for the reduced frequency of Sanitary Surveys of once every 5 years, if the identified significant deficiency is addressed by the timelines indicated in this report. Otherwise, your next survey is due in 3 years.

Regulations establishing a schedule of fees, including fees for sanitary surveys, were adopted August 3, 2007 (WAC 246-290-990). The amount due is \$969. An itemized worksheet is enclosed with the invoice.

If you have any questions, please contact me at (253) 395-6761 or by e-mail at virpi.salo-zieman@doh.wa.gov.

Sincerely,

Virpi Salo-Zieman
Office of Drinking Water, Regional Engineer

cc: Sandra Bodamer, King Water Co
Island County Public Health



Well 3, S03



well 2, S02



Source piping



Sanitary Control Area



PRV vault at Driftwood



Maple St reservoir



Maple St pump station



Maple St reservoir drain



Two mazzes for air suction, prechlorine injection point shown at the bottom



Missing screen on well 2 mazzei



three of the four filter tanks



pressure gauges for the treatment



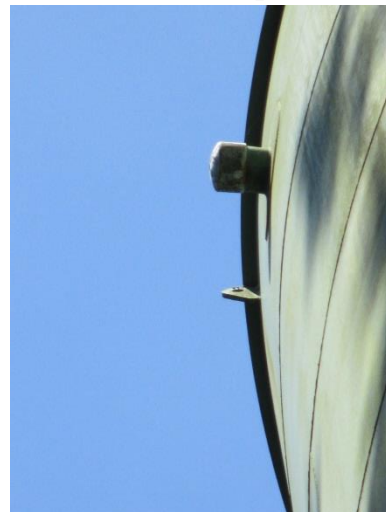
Backwash pond



Bachwash water sprinklers



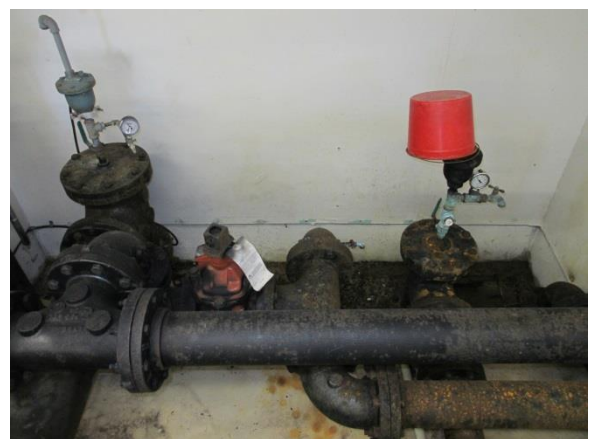
300K reservoir, rusted and worn outside



300K reservoir overflow



pump station



some of the Air-vac valves that need screening

APPENDIX R Coliform Monitoring Plan

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Coliform Monitoring Plan for:

A. System Information

Plan Date: 2020

Water System Name Scatchet Head Water Distrcit	County Island	System I.D. Number 76407X
Name of Plan Preparer Sandra Bodamer	Position Operator	Daytime Phone 360-678-5336
Sources: DOH Source Number, Source Name, Well Depth, Pumping Capacity	<u>SO2 ABR417</u> <u>SO3 ABN832</u>	
Storage: List and Describe	<u>300,000 gallon Reservoir – Guemes</u> <u>120,000 gallon Reservoir - Maple Pt</u>	
Treatment: Source Number & Process	<u>Birm</u>	
Pressure Zones: Number and name	<u>One</u>	
Population by Pressure Zone	_____	
Number of Routine Samples Required Monthly by Regulation:	<u>12(Twelve)</u>	
Number of Sample Sites Needed to Represent the Distribution System:	<u>3 (Three)</u>	
*Request DOH Approval of Triggered Source Monitoring Plan?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

*If approval is requested a fee will be charged for the review.

B. Laboratory Information

Laboratory Name <u>Exact Scientific Services, Inc.</u>	Office Phone 360-733-1205 After Hours Phone 360-393-1114
Address <u>1355 Pacific Place, Suite 101</u> <u>Ferndale, WA 98248</u>	Cell Phone 360-393-1114 Email <u>k.oostra@exactxcientific.com</u>
Hours of Operation <u>8 am – 4 pm</u>	
Contact Name <u>Kent Oostra</u>	
Emergency Laboratory Name <u>Same as Above</u>	Office Phone - - After Hours Phone - -
Address _____	Cell Phone - - Email _____
Hours of Operation _____	

Contact Name

C. Wholesaling of Groundwater

	Yes	No
We are a consecutive system and purchase groundwater from another water system.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		
We sell groundwater to other public water systems.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		
If yes, Water System Name: Contact Name: Telephone Numbers Office - - After Hours - -		

D. Routine, Repeat, and Triggered Source Sample Locations*

Location/Address for <u>Routine</u> Sample Sites	Location/Address for <u>Repeat</u> Sample Sites	Groundwater Sources for Triggered Sample Sites**
X1. Driftwood Dr Sample Tap	1-1. Driftwood Dr Sample Tap	SO2__
	1-2. Mitford sample station	S03
	1-3. 7904 Guemes	S__
X2. Mitford sample station	2-1. Driftwood Dr Sample Tap	S02
	2-2. Mitford sample station	S03
	2-3. 7904 Guemes	S__
X3. 7904 Guemes	3-1. Driftwood Dr Sample Tap	S02
	3-2. Mitford Sample Station	S03
	3-3. 7904 Guemes	S__

*NOTE: If you need more than three routine samples to cover the distribution system, attach additional sheets as needed.

** When you collect the repeats, you must sample every groundwater source that was in use when the original routine sample was collected.

Important Notes for Sample Collector:

E. Reduced Triggered Source Monitoring Justification (add sheets as needed):

--

F. Routine Sample Rotation Schedule

Month	Routine Site(s)	Month	Routine Site(s)
January	Driftwood Dr	July	Driftwood
February	Mitford Sample	August	Mitford Sample
March	7904 Guemes	September	7904 Guemes
April	Driftwood Dr	October	Driftwood
May	Mitford Sample	November	Mitford Sample
June	7904 Guemes	December	7904 Guemes

G. Level 1 and Level 2 Assessment Contact Information

Name Sandra Bodamer	Office Phone 360-678-5336 After Hours Phone 360-969-1019
Address PO Box 2243 Oak Harbor, WA 98277	Email sandra@kingwater.biz
Name	Office Phone - - After Hours Phone - -
Address	Email

H. *E. coli*-Present Sample Response

Distribution System <i>E. coli</i> Response Checklist				
Background Information	Yes	No	N/A	To Do List
We inform staff members about activities within the distribution system that could affect water quality.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Our Cross-Connection Control Program is up-to-date.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We routinely inspect all treatment facilities for proper operation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We identified one or more qualified individuals who are able to conduct a Level 2 assessment of our water system.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can activate an emergency intertie with an adjacent water system in an emergency.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a map of our service area boundaries.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have consumers who may not have access to bottled or boiled water.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There is a sufficient supply of bottled water immediately available to our customers who are unable to boil their water.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have identified the contact person at each day care, school, medical facility, food service, and other customers who may have difficulty responding to a Health Advisory.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have messages prepared and translated into different languages to ensure our consumers will understand them.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
We have the capacity to print and distribute the required number of notices in a short time period.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Policy Direction	Yes	No	N/A	To Do List
We have discussed the issue of <i>E. coli</i> -present sample results with our policy makers.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If we find <i>E. coli</i> in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Cont.)				

Distribution System *E. coli* Response Checklist

Potential Public Notice Delivery Methods	Yes	No	N/A	To Do List
It is feasible to deliver a notice going door-to-door.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a list of all of our customers' addresses.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a list of customer email addresses.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We encourage our customers to remain in contact with us using social media.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
We have an active website we can quickly update to include important messages.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We need a news release to supplement our public notification process.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Distribution System *E. coli* Response Plan

If we have *E. coli* in our distribution system we will immediately:

1. Call DOH.
2. Collect repeat and triggered source samples per Part D. Collect additional investigative samples as necessary.
3. If samples confirm *E. Coli*, immediately send out a Health Advisory to alert all users that there is a health risk associated with the water supply and the use of boiled or bottled water is strongly recommended.
4. Schedule inspection of system with Department of Health representative.
5. Flush and chlorinate entire system.
6. After chlorine is eliminated from system, schedule two sets of five coliform tests to confirm elimination of contamination.
7. After two sets of five coliform tests come back clear and DOH confirms elimination, lift advisory.

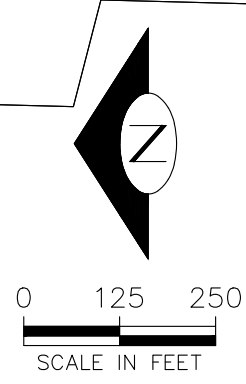
***E. coli*-Present Triggered Source Sample Response Checklist –
All Sources**

Background Information	Yes	No	N/A	To Do List
We review our sanitary survey results and respond to any recommendations affecting the microbial quality of our water supply.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We address any significant deficiencies identified during a sanitary survey.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There are contaminant sources within our Wellhead Protection Area that could affect the microbial quality of our source water, and If yes, we can eliminate them.	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
We routinely inspect our well site(s).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a good raw water sample tap installed at each source.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
After we complete work on a source, we disinfect the source, flush, and collect an investigative sample.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Notice	Yes	No	N/A	To Do List
We discussed the requirement for immediate public notice of an <i>E. coli</i> -present source sample result with our water system's governing body (board of directors or commissioners) and received direction from them on our response plan.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We discussed the requirement for immediate public notice of an <i>E. coli</i> -present source sample result with our wholesale customers and encouraged them to develop a response plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
We have prepared templates and a communications plan that will help us quickly distribute our messages.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<i>E. coli</i>-Present Triggered Source Sample Response Checklist – Source S__*				
Alternate Sources	Yes	No	N/A	To Do List
We can stop using this source and still provide reliable water service to our customers.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can provide bottled water to all or part of the distribution system for an indefinite period.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can quickly replace our existing source of supply with a more protected new source.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temporary Treatment	Yes	No	N/A	To Do List
This source is continuously chlorinated, and our existing facilities can provide 4-log virus treatment (CT = 6) before the first customer. If yes, at what concentration? _____ mg/L	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large portion of the distribution system.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*NOTE: If your system has multiple sources, you may want to complete a separate checklist for each source.

<i>E. coli</i>-Present Triggered Source Sample Response Plan – Source ____
<p>If we have <i>E. coli</i> in Source SO1 or SO2 water we will immediately:</p> <p>_____</p> <ol style="list-style-type: none"> 1. <u>Discontinue use of source immediately.</u> 2. <u>Notify customer immediately and ask for conservation.</u> 3. <u>Notify DOH and discuss how to proceed.</u>



1-1 SAMPLE STATION LOCATION



SCATCHET HEAD WATER DISTRICT
7906 GUEMES AVENUE
CLINTON, WASHINGTON 98236

SCATCHET HEAD WATER DISTRICT
WATER DISTRIBUTION SYSTEM
COLIFORM MONITORING PLAN



P.O. Box 1132
Freeland, WA 98249
P: 360.331.4131
F: 360.331.5131
www.dcgengr.com



0 125 250

SCALE IN FEET

235-036

1-1

SAMPLE STATION LOCATION



P.O. Box 1132
Freeland, WA 98249

P: 360.331.4131
F: 360.331.5131
www.dcgengr.com

DCG
civil structural

SCATCHET HEAD WATER DISTRICT
WATER DISTRIBUTION SYSTEM
COLIFORM MONITORING PLAN

SCATCHET HEAD WATER DISTRICT
7906 GUEMES AVENUE
CLINTON, WASHINGTON 98236

Coliform Monitoring Plan

A. SUMMARY OF SYSTEM INFORMATION

Owner:

Scatchet Head Water District (ID #67470X)
3792 E. Hubble Court
Clinton, WA 98236

Sources:

Water is supplied from two wells: DOH source designation S02 (Well #2 - 242 feet deep) and S03 (Well #3 - 246 feet deep). The wells are designated a well field, DOH source designation S04. The wells withdraw water from a confined aquifer. Both wells are located on the same District owned lot that also contains the chlorination and pumping facilities.

Storage:

Two above ground standpipes were built in 1980 and 1997.

Each reservoir has a combined inlet outlet pipe. Water circulation is accomplished with an inside tee with check valve to direct inflow to the top of the reservoir and permit outflow from the bottom of the reservoir. Each reservoir has a sample station for the collection of a water sample from the outlet pipe.

Treatment:

Water treatment consists of continuous chlorination (injection of sodium hypochlorite at the well site).

Pumping Stations:

The system has one pumping station, at the well site, equipped with two 15 hp booster pumps to supply the high elevation service area and reservoirs.

Coliform Monitoring Plan

Pressure Zones:

The high elevation service area (pressure zone) supplies approximately one-half of the subdivision. Two pressure regulating valve station connects the high elevation service area with the mid-elevation service area. The low elevation service area is supplied from the two 7,000 gallon horizontal tanks at the well site (raw water tanks supplying suction supply to the booster pumps).

Population:

The District currently supplies 342 customers in the service area. Assuming 2.5 residents per customer, the District currently service population is 855.

The District is currently authorized to supply 350 single family residential customers or equivalent (ERUs).

B. SAMPLING INFORMATIONSampling Requirements:

The minimum number of routine samples required each month is a function of the number of people supplied by the system. If a sample shows the presence of coliform, the number of repeat samples required to be collected in the month the presence was detected and in the following month is also a function of the number of people supplied by the system. Both requirements for small systems are summarized below.

Pop. Served	No. of Routine Samples Each Month	No. of Repeat Samples in Same Month	No. of Samples in the Next Month
25 to 1,000	1	4	5
1,001 to 2,500	2	3	5

Coliform Monitoring Plan

In the month the presence of coliform was detected, the four repeat samples shall be collected from the following locations:

First Repeat: from the sample location of the previous "routine" sample.

Second Repeat: from a customer within 5 service connections either side of the "routine" sample location (e.g., upstream).

Third Repeat: from a customer within 5 service connections on the opposite side of the "routine" sample location as the second repeat sample location (e.g., downstream).

Fourth Repeat: from a customer within 5 service connections either side of the "routine" sample location but not from the same location as one of the other repeat samples (e.g., either upstream or downstream).

For a system collecting two routine samples per month, the Fourth repeat sample may be omitted.

The month following the reported presence of coliform, five sample must be collected from the distribution system. The sample locations should include the "routine" sites scheduled for the current and previous month. The remaining sample sites should be chosen to represent an overall sampling of water quality in the distribution system.

Additional Sampling:

The above sampling schedule states the minimum requirements. The District may choose to collect additional samples.

When the presence of coliform occurs more than one time in a six month period, additional samples should be collected from the sources of supply, other areas of distribution system, and from the storage reservoirs to determine extent of the coliform problem. Additional sampling will likely be required by the WA DOH if the repeat sampling shows the presence of coliform.

For the procedures to be followed if repeat samples show the presence of coliform, consult the District's "Emergency Procedures" in the *MANAGEMENT AND OPERATIONS MANUAL*.

Coliform Monitoring Plan

Identified Sample Locations:

The following routine sites were selected based on:

- a) alternating the sites between the high elevation service area (pumped supply) and the low elevation service area (gravity supply), and
- b) to detect bacteria regrowth or system contamination, selecting sites near the end of the distribution system and/or that will be representative of a long retention time of water in the system.

Curbside water sample stations (Kupferle "Eclipse" type) have been installed in the distribution system for the purposes collecting routine samples. Therefore, routine samples will be collected from these stations, repeat samples from homes of customers.

The identified customers for the routine and repeat sample collection are shown on the attached list, and shown in the accompanying schematic plan of the distribution system.

The address of the locations for collection of the routine and repeat samples are attached.

ADDENDUM TO: Scatchet Head Water District Coliform Monitoring Plan

Distribution System – E. Coli Response Plan

The following steps will be taken by the District if E. coli is detected within the distribution system.

- 1) **Call/Notify Washington State Department of Health (DOH)**
- 2) **Complete the attached “Distribution System E.Coli Response Checklist”.**
- 3) **Collect repeat sample, upstream and downstream samples (per Coliform Monitoring Plan). Additional investigative samples will be taken as necessary.**
- 4) **Inspect the water system facilities, including treatment plan operation.**
- 5) **Interview SMA staff to determine whether anything unusual was occurring in the distribution system service area, especially following the pervious samples were taken.**
- 6) **Review any construction activities, water main breaks, pressure outages, or other occurrences that may have occurred prior to the incident.**
- 7) **Review Cross-Connection Control Program status.**
- 8) **Provide as Health Advisory based on the finding in steps 3-6. Issue Health Advisory as required.**
- 9) **Following the results form repeat samples, respond as appropriately:**
 - a) **If repeat samples are satisfactory: Lift any Health Advisory if one was issued. Notify customers in accordance with the Coliform Monitoring Plan.**
 - b) **If any repeat samples are unsatisfactory: Issue a Health Advisory if not already in place. Host the DOH for a system inspection and respond appropriately to inspection findings.**

Scatchet Head Water District – E. Coli Response Checklist

		Yes	No	N/A	Notes:
1.	We inform staff members about activities within the distribution system that could affect water quality.	X			
2.	We document all water main breaks, low pressure incidents, water outages, construction, and repair activities.	X			
3.	We can easily access and review documentation on water main breaks, low pressure incidents, water outages, construction, and repair activities.	X			
4.	The Cross-Connection Control Program is up-to-date.	X			
5.	We test all cross-connection control devices annually as required, with easy access to the proper documentation.	X			
6.	We routinely inspect all treatment facilities for proper operation.	X			
7.	We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	X			
8.	We can activate an emergency intertie with an adjacent water system in an emergency.		X		
9.	We have a map of our service area boundaries.	X			
10.	We have consumers who may not have access to bottle or boiled water.	X			
11.	There is a sufficient supply of bottled water immediately available to our customers who are unable to boil their water.		X		
12.	We have identified the contact person at each day care, school, medical facility, food service, and other customers who may have difficulty responding to a Health Advisory.			X	
13.	We have messages prepared and translated into different languages to ensure they will be understood by our consumers.	X			Only English.
14.	We have the capacity to print and distribute the required number of notices in a short period of time.	X			
Policy Direction:					
15.	We have discussed the issue of E. coli-present sample results with our policy makers.	X			
16.	If we find E. coli in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	X			
Potential Public Notice Delivery Methods:					
17.	It is feasible to deliver a notice going door to door	X			
18.	We have a list of all our customer addresses.	X			
19.	We have a list of customer telephone numbers or access to a reverse 9-1-1 system.	X			
20.	We have a list of customer email addresses.	X			
Background Information:					
21.	We encourage our customers to remain in contact with using social media.		X		
22.	We have an active website we can quickly update to include important messages.	X			
23.	Our customers drive by a single location where we could post an advisory and expect everyone to see it.	X			
24.	We need a news release to supplement our public notification.	X			

APPENDIX S Water Quality Results

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Division of Environmental Health
Office of Drinking Water

Help

View Sample Detail - WSID 76470X - SCATCHET HEAD WATER

DISTRICT

Collect Date 11/25/1997
Lab Number 119
Lab Name Lab/Cor, Inc
Sample Number 95264
Source 02
Analyte Group IOC-INORGANIC CONTAMINANTS
Test Panel ASB-ASBESTOS
Sample Location TEST STATION 1
Sample Type Unknown

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0115	ASBESTOS	LT	0.1910	7.0000	0.2000	MFL

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Department of Health, Office of Drinking Water

Street Address:

243 Israel Road S.E. 2nd floor
Tumwater, WA 98501

Mail:

PO BOX 47822
Olympia, WA 98504-7822

Send inquiries about DOH and its programs to the [Health Consumer Assistance Office](#)

Comments or questions regarding this Web site? Send email to [Environmental Health Application Testing and Support](#) or call 888-457-2467.

For technical issues with this website send email to DOH IT Service Desk or call 360-236-4357.



Division of Environmental Health
Office of Drinking Water

Help

View Sample Detail - WSID 76470X - SCATCHET HEAD WATER

DISTRICT

Collect Date 7/8/2019
Lab Number 174
Lab Name Exact Scientific Services, Inc
Sample Number 37036
Source Dist
Analyte Group MICRO-MICROBIOLOGICAL
Test Panel COLI_AP-ABSENCE / PRESENCE
Sample Location Sample Tap Driftwood
Sample Type Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	A/P	Units	Maximum Contaminant Level	State Reporting Limit
0001	TOTAL COLIFORM	EQ	A	/100ml		
0003	E. COLI	EQ	A	/100ml		

Records 1 - 2 of 2

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Division of Environmental Health
Office of Drinking Water

Help

View Sample Detail - WSID 76470X - SCATCHET HEAD WATER

DISTRICT

Collect Date 4/21/2010
 Lab Number 057
 Lab Name Avocet Environmental Testing
 Sample Number 88418
 Source 04
 Analyte Group IOC-INORGANIC CONTAMINANTS
 Test Panel IOC-COMPLETE INORGANIC ANALYSIS
 Sample Location scatchet head
 Sample Type Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant		Units
				Level	State Reporting Limit	
0004	ARSENIC	EQ	0.0110	0.0104	0.0010	mg/L
0005	BARIUM	EQ	0.0390	2.0000	0.1000	mg/L
0008	IRON	EQ	0.1400	0.3000	0.1000	mg/L
0010	MANGANESE	EQ	0.0170	0.0500	0.0100	mg/L
0014	SODIUM	EQ	36.3000		5.0000	mg/L
0015	HARDNESS	EQ	130.0000		10.0000	mg/L
0016	CONDUCTIVITY	EQ	390.0000	700.0000	70.0000	Umhos/cm
0020	NITRATE-N	EQ	0.3800	10.0000	0.5000	mg/L
0021	CHLORIDE	EQ	16.0000	250.0000	20.0000	mg/L
0022	SULFATE	EQ	1.3000	250.0000	50.0000	mg/L
0023	COPPER	EQ	0.0080		0.0200	mg/L
0161	TOTAL NITRATE/NITRITE	EQ	0.3800		0.5000	mg/L
0006	CADMIUM	LT	0.0005	0.0050	0.0010	mg/L
0007	CHROMIUM	LT	0.0050	0.1000	0.0070	mg/L
0009	LEAD	LT	0.0010		0.0010	mg/L
0011	MERCURY	LT	0.0005	0.0020	0.0002	mg/L
0012	SELENIUM	LT	0.0050	0.0500	0.0020	mg/L
0013	SILVER	LT	0.0020	0.1000	0.1000	mg/L
0017	TURBIDITY	LT	0.1000		0.1000	NTU
0018	COLOR	LT	5.0000	15.0000	15.0000	CU
0019	FLUORIDE	LT	0.2000	4.0000	0.2000	mg/L
0024	ZINC	LT	0.0150	5.0000	0.2000	mg/L
0110	BERYLLIUM	LT	0.0020	0.0040	0.0003	mg/L
0111	NICKEL	LT	0.0100	0.1000	0.0050	mg/L
0112	ANTIMONY	LT	0.0050	0.0060	0.0030	mg/L



Division of Environmental Health
Office of Drinking Water

Help

View Sample Detail - WSID 76470X - SCATCHET HEAD WATER

DISTRICT

Collect Date 11/27/2018
Lab Number 174
Lab Name Exact Scientific Services, Inc
Sample Number 57996
Source Dist
Analyte Group IOC-INORGANIC CONTAMINANTS
Test Panel LCR-LEAD COPPER
Sample Location boxxxxxxxxxst
Sample Type Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0023	COPPER	EQ	0.1060		0.0200	mg/L
0009	LEAD	LT	0.0010		0.0010	mg/L

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DISTRICT

Collect Date 8/27/2018
Lab Number 174
Lab Name Exact Scientific Services, Inc
Sample Number 41570
Source 04
Analyte Group IOC-INORGANIC CONTAMINANTS
Test Panel IOC_SHORT-INORGANIC SHORT FORM
Sample Location s04
Sample Type Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0004	ARSENIC	EQ	0.0079	0.0104	0.0010	mg/L
0010	MANGANESE	EQ	0.0468	0.0500	0.0100	mg/L
0008	IRON	LT	0.1000	0.3000	0.1000	mg/L
0020	NITRATE-N	LT	0.2000	10.0000	0.5000	mg/L

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View Sample Detail - WSID 76470X - SCATCHET HEAD WATER

DISTRICT

Collect Date 6/28/2019
Lab Number 174
Lab Name Exact Scientific Services, Inc
Sample Number 37699
Source Dist
Analyte Group DBP-DISINFECTION BY PRODUCTS
Test Panel HAA5-HALO-ACETIC ACIDS
Sample Location 3790 hubble ct
Sample Type Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0411	MONOCHLOROACETIC ACID	EQ	2.6000		2.0000	ug/L
0412	DICHLOROACETIC ACID	EQ	18.4000		1.0000	ug/L
0413	TRICHLOROACETIC ACID	EQ	24.4000		1.0000	ug/L
0416	HAA(5)	EQ	45.4000	60.0000		ug/L
0417	BROMOCHLOROACETIC ACID	EQ	3.0000		1.0000	ug/L
0414	MONOBROMOACETIC ACID	LT	1.0000		1.0000	ug/L
0415	DIBROMOACETIC ACID	LT	1.0000		1.0000	ug/L

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DISTRICT

Collect Date 6/28/2019
Lab Number 174
Lab Name Exact Scientific Services, Inc
Sample Number 37698
Source Dist
Analyte Group DBP-DISINFECTION BY PRODUCTS
Test Panel THM-TOTAL TRIHALOMETHANE
Sample Location 3650 orcas dr
Sample Type Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0031	TOTAL TRIHALOMETHANE	EQ	84.0000	80.0000		ug/L
0027	CHLOROFORM	EQ	66.6000		0.5000	ug/L
0028	BROMODICHLOROMETHANE	EQ	14.8000		0.5000	ug/L
0029	DIBROMOCHLOROMETHANE	EQ	2.6000		0.5000	ug/L
0030	BROMOFORM	LT	0.5000		0.5000	ug/L

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DISTRICT

Collect Date 12/12/2016
Lab Number 233
Lab Name Energy Laboratories, Inc-Salt Creek
Sample Number 68001
Source 04
Analyte Group RAD-RADIONUCLIDES
Test Panel RAD-RADIONUCLIDES
Sample Location 68946
Sample Type Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0165	GROSS ALPHA	EQ	3.6000		3.0000	pCi/L
0166	RADIUM 228	EQ	0.2000	5.0000	1.0000	pCi/L

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DISTRICT

Collect Date 12/5/2016
 Lab Number 174
 Lab Name Exact Scientific Services, Inc
 Sample Number 47597
 Source 04
 Analyte Group VOC-VOLATILE ORGANIC CONTAMINANTS
 Test Panel VOC1-VOLATILE ORGANIC
 Sample Location 68711
 Sample Type Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant		Units
				Level	State Reporting Limit	
0027	CHLOROFORM	EQ	35.7000		0.5000	ug/L
0028	BROMODICHLOROMETHANE	EQ	9.6000		0.5000	ug/L
0029	DIBROMOCHLOROMETHANE	EQ	1.8000		0.5000	ug/L
0031	TOTAL TRIHALOMETHANE	EQ	47.1000	80.0000		ug/L
0030	BROMOFORM	LT	0.5000		0.5000	ug/L
0045	VINYL CHLORIDE	LT	0.5000	2.0000	0.5000	ug/L
0046	1,1 DICHLOROETHYLENE	LT	0.5000	7.0000	0.5000	ug/L
0047	1,1,1 TRICHLOROETHANE	LT	0.5000	200.0000	0.5000	ug/L
0048	CARBON TETRACHLORIDE	LT	0.5000	5.0000	0.5000	ug/L
0049	BENZENE	LT	0.5000	5.0000	0.5000	ug/L
0050	1,2 DICHLOROETHANE	LT	0.5000	5.0000	0.5000	ug/L
0051	TRICHLOROETHYLENE	LT	0.5000	5.0000	0.5000	ug/L
0052	1,4 DICHLOROBENZENE	LT	0.5000	75.0000	0.5000	ug/L
0053	CHLOROMETHANE	LT	0.5000		0.5000	ug/L
0054	BROMOMETHANE	LT	0.5000		0.5000	ug/L
0055	CHLOROETHANE	LT	0.5000		0.5000	ug/L
0056	METHYLENE CHLORIDE(DICHLOROMETHANE)	LT	0.5000	5.0000	0.5000	ug/L
0057	TRANS- 1,2 DICHLOROETHYLENE	LT	0.5000	100.0000	0.5000	ug/L
0058	1,1 DICHLOROETHANE	LT	0.5000		0.5000	ug/L
0059	2,2 DICHLOROPROPANE	LT	0.5000		0.5000	ug/L
0060	CIS- 1,2 DICHLOROETHYLENE	LT	0.5000	70.0000	0.5000	ug/L
0062	1,1 DICHLOROPROPENE	LT	0.5000		0.5000	ug/L
0063	1,2 DICHLOROPROPANE	LT	0.5000	5.0000	0.5000	ug/L
0064	DIBROMOMETHANE	LT	0.5000		0.5000	ug/L
0065	CIS- 1,3 DICHLOROPROPENE	LT	0.5000		0.5000	ug/L



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Help

View Sample Detail - WSID 76470X - SCATCHET HEAD WATER

DISTRICT

Collect Date 10/3/2018
 Lab Number 125
 Lab Name Anatek Labs, Inc Moscow
 Sample Number 14254
 Source 04
 Analyte Group SOC-SYNTHETIC ORGANIC CONTAMINANTS
 Test Panel PEST1-GENERAL PESTICIDE SUITE
 Sample Location s04 wells 2&3
 Sample Type Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant		Units
				Level	State Reporting Limit	
0033	ENDRIN	LT	0.0100	2.0000	0.0100	ug/L
0034	LINDANE (BHC - GAMMA)	LT	0.0200	0.2000	0.0200	ug/L
0035	METHOXYCHLOR	LT	0.1000	40.0000	0.1000	ug/L
0036	TOXAPHENE	LT	1.0000	3.0000	1.0000	ug/L
0117	Alachlor	LT	0.2000	2.0000	0.2000	ug/L
0118	ALDRIN	LT	0.1000		0.1000	ug/L
0119	ATRAZINE	LT	0.1000	3.0000	0.1000	ug/L
0120	BENZO (A) PYRENE	LT	0.0200	0.2000	0.0200	ug/L
0121	BUTACHLOR	LT	0.1000		0.1000	ug/L
0122	CHLORDANE (TOTAL)	LT	0.2000	2.0000	0.2000	ug/L
0123	DIELDRIN	LT	0.1000		0.1000	ug/L
0124	DI (ETHYLHEXYL) ADIPATE	LT	0.6000	400.0000	0.6000	ug/L
0125	DI (ETHYLHEXYL) PHTHALATE	LT	0.6000	6.0000	0.6000	ug/L
0126	HEPTACHLOR	LT	0.0400	0.4000	0.0400	ug/L
0127	HEPTACHLOR EPOXIDE	LT	0.0200	0.2000	0.0200	ug/L
0128	HEXACHLOROBENZENE	LT	0.1000	1.0000	0.1000	ug/L
0129	HEXACHLOROCYCLO PENTADIENE	LT	0.1000	50.0000	0.1000	ug/L
0130	METOLACHLOR	LT	0.1000		0.1000	ug/L
0131	METRIBUZIN	LT	0.1000		0.1000	ug/L
0132	PROPACHLOR	LT	0.1000		0.1000	ug/L
0133	SIMAZINE	LT	0.0700	4.0000	0.0700	ug/L
0153	PCB (AS TOTAL AROCHLORS)	LT	0.5000	0.5000	0.5000	ug/L
0173	AROCHLOR 1221	LT	20.0000		20.0000	ug/L
0174	AROCHLOR 1232	LT	0.5000		0.5000	ug/L
0175	AROCHLOR 1242	LT	0.3000		0.3000	ug/L



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DISTRICT

Collect Date 12/12/2005
Lab Number 125
Lab Name Anatek Labs, Inc Moscow
Sample Number 10734
Source 04
Analyte Group SOC-SYNTHETIC ORGANIC CONTAMINANTS
Test Panel ENDO-ENDOTHAL
Sample Location s-3 wf
Sample Type Pre-Treatment / Raw

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0151	ENDOTHAL	LT	20.0000	100.0000	9.0000	ug/L

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DISTRICT

Collect Date 12/12/2005
Lab Number 125
Lab Name Anatek Labs, Inc Moscow
Sample Number 10734
Source 04
Analyte Group SOC-SYNTHETIC ORGANIC CONTAMINANTS
Test Panel FUMIGANT-SOIL FUMIGANTS
Sample Location s-3 wf
Sample Type Pre-Treatment / Raw

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	State Reporting Limit	Units
0079	1,2,3 TRICHLOROPROPANE	LT	0.5000		0.5000	ug/L
0102	EDB (ETHYLENE DIBROMIDE)	LT	0.0200	0.0500	0.0100	ug/L
0103	DBCP	LT	0.0400	0.2000	0.0200	ug/L

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DISTRICT

Collect Date 11/24/2014
Lab Number 125
Lab Name Anatek Labs, Inc Moscow
Sample Number 55259
Source 04
Analyte Group SOC-SYNTHETIC ORGANIC CONTAMINANTS
Test Panel HERB1-CHLOROPHENOXY HERBICIDES
Sample Location (45439) scatchet head
Sample Type Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant		Units
				Level	State Reporting Limit	
0037	2,4 - D	LT	0.5000	70.0000	0.1000	ug/L
0038	2,4,5 TP (SILVEX)	LT	1.0000	50.0000	0.2000	ug/L
0134	PENTACHLOROPHENOL	LT	0.2000	1.0000	0.0400	ug/L
0135	2,4 DB	LT	1.0000		1.0000	ug/L
0136	2,4,5 T	LT	0.4000		0.4000	ug/L
0137	DALAPON	LT	5.0000	200.0000	1.0000	ug/L
0138	DICAMBA	LT	0.2000		0.2000	ug/L
0139	DINOSEB	LT	1.0000	7.0000	0.2000	ug/L
0140	PICLORAM	LT	0.5000	500.0000	0.1000	ug/L
0220	BENTAZON	LT	0.5000		0.5000	ug/L
0221	DICHLORPROP	LT	0.5000		0.5000	ug/L
0222	TOTAL DCPA	LT	1.0000		1.0000	ug/L
0223	ACIFLUORFEN	LT	2.0000		2.0000	ug/L
0224	CHLORAMBEN	LT	0.2000		0.2000	ug/L
0225	DCPA ACID METABOLITES	LT	0.1000		0.1000	ug/L
0226	3,5 DICHLORBENZOIC ACID	LT	0.5000		0.5000	ug/L

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APPENDIX T Public Meeting Records

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SCATCHET HEAD WATER DISTRICT (SHWD)
ISLAND COUNTY WASHINGTON

Minutes for September 5, 2019 - Special Meeting, 7:00 PM

MEETING PLACE

Scatchet Head Community Club-Driftwood Drive, Clinton

IN ATTENDANCE:

Commissioner Mullins
Commissioner Schoeler
Commissioner Carr

ABSENT:

None

ALSO PRESENT:

Brenda Bosman – King Water Company
Robert Bennion – Davido Consulting Group
Bill Benshoof – District Manager
Property Owners:
Sandra Anderson
Pushkara Ashford
Willie Benshoof
Alexandria Boyer
Jordan Boyer
Sara Carr
John Chaffey
Kit Cohn
Seth Conlin
Eric Cooper
Aurelle DeLapp-Erickson
Margaret Heck
Kirk Horton
Jackie Lechelt
Jill Lipoti
Jaci Mach
Brian Maddux
Rachel Martinez
Larry Metz
Peggy Metz
Lori Reiter
Jim Repass
Janet Rivers
Mary Beth Schoeler
Victoria Simmons

Will Sperling
Peter Sprinz
Karen Thorburn
David White
Ron Winters

Meeting called to order at 7:02 PM by Commissioner Schoeler.

Commissioner Schoeler stated that this meeting would pertain to three topics:

- Water System Plan (WSP)
- Long range goals for the water district
- Rate increase for water dues

He noted that the last WSP was completed in 1998, so an update to the plan was overdue. The Washington State Department of Health (DOH) recommends that the WSP be updated every six years.

Engineers Report

Robert Bennion, engineer from Davido Consulting Group, was in attendance to answer questions regarding the WSP. Robert explained that he was the engineer that updated the plan. His first step was to hold a meeting with representatives from the DOH, who told him which topics to include in the plan. These topics are: description of water system, basic planning data, water demand forecasting, system analysis, water rights, source water protection and cross contamination, operation and maintenance, design & construction standards, short, mid-range, and long term goals, and finances & budgeting. Robert stated:

- He is essentially finished with the WSP.
- The draft of WSP has been sent to the DOH for review.
- After DOH review, the WSP will be sent to the county to ensure maps are consistent.
- The WSP will be sent to the Department of Ecology for review.
- The various agencies will make comments, or suggest changes; Robert will address all of these and modify the WSP accordingly.
- After comments & changes are addressed, the WSP will be sent to the DOH for final approval. Commissioner will then officially adopt the WSP.
- Time period for final approval: about three months.

Question from Victoria Simmons: Will notes from the special meeting and customer comments be included in the WSP? Answer: Yes, per Robert.

Question from David White: What is the purpose of the plan? Do most water systems try to follow the plan after it is complete? Answer: Per Robert, the WSP is a guide to run the water system, and it includes capital improvement project recommendations. All projects in the plan are considered approved by the DOH and will not require submittal again for approval when the time comes to begin work on the projects.

Question from Victoria Simmons: Page six from the hard copy version of the WSP suggests possible expansion of the water system; why is this in the plan? Answer: Per Robert, it is normal procedure to include a section regarding financial viability in the WSP. Increasing the service area is one way to increase the number of customers, which can lead to more income for the district. Commissioner Schoeler noted that the commissions voted to not extend the service area so the section regarding expansion was removed from the WSP.

Question from Victoria Simmons: Page 20 from the hard copy version: back-up power requirements for the well – this item has been discussed for many years, any progress? Answer: Per Commissioner Schoeler – there is an auto-start emergency generator at the pump house to power the booster pumps, but he would like to see an emergency back-up supply, manual transfer, and hydrant at the wells also.

Question from Victoria Simmons: Why did Commissioner Schoeler make a comment about SHWD becoming like Puerto Rico in a major disaster at the WSP planning meeting with the DOH on March 18, 2018? Answer: Per Commissioner Schoeler, he did not make that statement. Victoria Simmons will find the copy of the minutes.

Question from Victoria Simmons: Page 37 notes “it was necessary to by-pass the treatment system due to piping configuration” during the tank refurbishing project. Will this problem be addressed in the WSP? Answer: Per Robert, the statement was an error in the original draft; there is a correction in the new version of the WSP. Robert also noted that the filters will be evaluated as part of the WSP.

Question from Victoria Simmons: The Sanitary Survey noted that the reservoir was not systematically sound, why was this not addressed as part of the tank refurbishing project? Answer: Per Robert; they, as the engineers, were tasked with refurbishing the tank only, not to look at structural issues. The cost to demolish and rebuild the tank may have cost \$1,000,000.00. Commissioner Schoeler noted that the DOH required that the tank be painted on both the inside and outside because of rust patches found by divers who cleaned the tank. Robert stated that the project was worthwhile - once the tank was emptied, holes at the bottom of the tank were found and repaired.

Jill Lipoti noted that she had emailed prepared questions (see attached). She said that she toured the water system and felt that the WSP did not represent the as-built condition of the treatment and distribution systems. She also noted:

- She supports a gradual increase in water rates.
- Encouraged the commissioners to look at the physical nature of infrastructure, and invest in an asset management plan.
- The inventory of pumps, etc was well done.
- There are discrepancies in the WSP – some water mains were replaced but not reflected in the plan. Robert explained that new as-built maps were needed.

Jill suggested that these items be acted on now:

- Generator for wells
- Transfer water right from well 1 to wells 2 & 3

- Backwash pond
- Look at low cost loans, grants, etc
- Affordability Analysis – EPA (Glen Barnes) offers this service for free – they look at income of customers and offer rate options based on data
- Include pertinent SHWD documents on a website
- WSP should address pipe scale/brown water
- Would like a separate document for Operations/Maintenance in the WSP

Lori Reiter also commented that she would like the backwash pond addressed as a priority. Commissioner Schoeler stated that SHWD had hired well-driller years ago to drill a new well and transfer the water rights; but his recollection was that after the new well was drilled the water right transfer was denied because the new well was in a different quarter-section. Commissioner Mullins stated that the commissioners will address the issue and consult the attorney for possible transfer of water rights.

Robert addressed the pipe scale and filtration system. He stated that there is definitely pipe scale, which leads to discolored water. He noted that chlorine is the oxidizer for the current filtration system, and that pilot testing revealed the ozone treatment did not work to remove iron and manganese so it was removed. Regular testing confirms that the filters are working. Currently, the water system is flushed once per year, but he suggested that it be flushed more often.

David White noted/asked:

- The WSP states that Periwinkle is flushed every two months; Robert will make the change to the WSP if a correction is needed.
- He submitted a nine-page document of comments and corrections in regards to the WSP – Robert stated that he will address the comments and/or corrections in the updated version of the WSP.
- How many hours did Robert spend onsite at the physical areas of the water system?
Answer, per Robert: 4 hours spent onsite, plus many hours during tank refurbishing project. He noted that he's worked for SHWD for two years.

Victoria Simmons noted that she was disappointed in the section of the WSP regarding Emergency Preparedness, and that the commissioners contact information should be included. Robert stated that he will include the contact info if the commissioners agree to have the info published.

Robert stated that both wells are in the same aquifer, and that most of the island shares the same aquifer. Jill inquired about TTHM/HAA's, noting that quarterly testing is required, and Robert stated that this testing monitors chlorine by-products.

Jordan Boyer inquired about the fire hydrants – do all hydrants function? Commissioner Schoeler stated that the hydrant valves are exercised annually, during flushing, and one hydrant was recently repaired.

Water Rates

Commissioner Mullins opened up the discussion regarding the water rate increase. He stated that the total for repairs and upgrades in the WSP is \$1,946,500.00, and that the commissioners will explore low interest loans, grants, etc in an attempt to keep costs down. A discussion about the rate increase ensued; is the rate increase high enough? Commissioner Mullins explained that the goal was to keep rates reasonable and raise rates gradually out of respect for those who may struggle financially to pay more. He mentioned that 52 certified letters were mailed last quarter to customers who were past due, suggesting that there are many customers in the neighborhood that struggle to pay their water bill. The rate change will consist of a \$10.00 increase to the base rate once per year for the next four years, plus 14.6% increase yearly to each of the upper tiered rates for the next four years. Plus, the SHWD paid off a loan in 2019 so \$45,000.00 per year will no longer be needed for the Bond Fund. The discussion continued as to whether the increase was too low or too high. Most customers present believed a larger increase was due, but others suggested that many SHWD customers were on low or fixed incomes, and a sharp increase would be detrimental to their finances. A sliding scale for low income customers was discussed, along with setting up a non-profit organization within SHWD to raise funds to help pay water bills to qualified low income customers. Pushkara Ashford suggested that a “community revenue generating project” be undertaken to help those who cannot afford their water bill, Commissioner Mullins stated that he had spoken with the USDA and was told that SHWD may qualify for a 2% loan. Necessary requirement for this loan is \$100,000.00 in reserves, which the district has in their emergency fund. Commissioner Mullins also noted that they are aware that SHWD water rates are too low – they compared rates with other water systems in the area and SHWD is on the low end.

Comments from David White:

- 1.9 million needed for projects listed in the WSP; \$685,000.00 needed for projects listed as “near-term and immediate”, but the rate increase will only provide additional funds of approximately \$100,000.00 over the next two years. This will only cover about 15% of these projects so a \$600,000.00 loan will be needed. Loan payments could be as high as \$3,200.00 per month, and the rate increase will consume monies generated from the rate increase.
- Water shares currently cost \$5000.00 – an increase should be contemplated as part of the rate structure to increase funds and be included in the WSP.

Full question/comment document from David White is attached.

Full question/comment document from Victoria Simmons is attached.

Commissioner Schoeler motioned to close the meeting at 8:40 PM.

Commissioner Mullins seconded. (*Motion carried, unanimously approved and passed*).

Commissioner Schoeler, President

Commissioner Carr - Secretary

Commissioner Mullins – V.P.

No.	Page No.	Section No.	Comment/Question	DCG Response
1	20	3.1.8	Autodialer for power outages, is this in place? Emergency generator is in place for booster station, not for wells. Hydrant spacing, and does a 2" standpipe meet that requirement?	<p>The documents I have from the 1999 pump & treatment building layout show that an "Autodialer – RACO Verbatim Series VSS" was installed next to the pump controls.</p> <p>Regarding hydrant spacing, a 2" standpipe does not meet the requirement for a hydrant. The Washington Administrative Code defines a hydrant as conforming to "American Water Works Association specifications for dry barrel fire hydrants. Each hydrant shall have at least two hose connections of 2 1/2" diameter each and one pumper connection. All connections must have national standard threads or other connection devices consistent with local fire protection authority requirements"</p>
2	21	3.2.1	Water testing- Nothing on Arsenic.	Arsenic has been added to the list of water testing.
3	23	3.3.1	Source. Water rights form Well#1 to new location, maybe Maple point Reservoir. Since both wells 2 and 3 have same water right. (See also Section 8.2.1)	This section has been revised to state, "The District will continue to explore options to transfer the water right to Well 2, Well 3, or a future well." The water right would have to be transferred to a source of water and can't be transferred to a storage facility such as the Guemes or Maple Point Reservoir.
4	27	3.3.3.7	Water Age and Turnover. Maple Point Reservoir currently has a recirculating pump installed	This section has been modified to note the recirculating pump installed at the Maple Point Reservoir.
5	39	Table 3-20	#4 Transfer water right to well 3 or new site.	The table has been updated as noted.
6	39	Table 3-20	#10 Should be Well Pumps	The table has been updated as noted.
7	51	6.6	Correct the contact information in last paragraph.	The contact information has been updated as noted.
8	53	6.8	If the District has passed a Resolution for this Program, then it should be included in this section.	The Cross-Connection Control plan is now provided is Appendix K of the report. A reference if provided in the section noted.
9	56	7.2	Can we delete 11,13 and 14, do they apply?	Items 13 and 14 have been removed. Item 11 has been removed except for the signing of any necessary District agreements which has been combined with the step involving payment of fees.
10	61	8.2.3	Confirm that treatment system can operate to both reservoirs.	It is our understanding that the treatment system filters are backflushed from the Guemes Avenue reservoir. While in theory the treatment system can function to either reservoir there is some limited functionality if the Guemes reservoir is empty for an extended period of time. The wording in the Plan regarding this issue has been modified in this section and in Division 3.
11	62	8.2.4	List sites of 2" PVC mains.	DCG has coordinated with King Water to determine the location of the exposed watermains. The identified watermains appear to be 6-inch lines located in an easement west of Samish Ct. The size, location, and quantity of the exposed mains has been clarified in the plan in both Division3 and 8.
12	64	8.2.5	Last Sentence?	The wording in the last sentence of Section 8.5.2 has been revised.

13	41	4.1.1.1	You said billings are bi-monthly. Billings are quarterly.	Section 4.1.1.1 has been updated to reflect the quarterly basis as correctly referenced in Section 9.
14	iii	Table 1	Summarizes the water sources. Notes well #1 as "Emergency Use Only". Contradicts page 4 and 59, where Well #1 is described as "abandoned". The state's sentry database records for our district shows this well under the main heading "Abandoned" and shows the source status as "inactive" and the usage as "emergency". The previous plan stated this had been tilled with concrete and cut off below grade as required. Which is the correct term? Why call it one thing in one piece and another elsewhere?	As noted, the District's WFI has information regarding both the abandonment of the well and its usage as emergency. Table 1 has been modified for consistency. The District's WFI should be updated to not reflect this well as emergency use since the method of abandonment prohibits emergency use.
15	1	1.1.2	Reads that SHWD is a municipal corporation as set forth in the Revised Code of Washington (ROW) Title 57 and authorized by the King County ordinances. The District is subject to Federal, State and Local regulations. King County	The references in this section has been corrected as noted.
16	2	1.2.1	"History of Water System Development and Growth" reads The District provides water for the Plat of Scatchet Head (1965). Cottage Glenn PRO (1996) and the Plat of Scatchet Hills Expansion (1996). Have checked in person with the county - both Planning and Accessor's offices. Neither show a Plat of Scatchet Hills Expansion or have any record of a plat of that name. This is also shown in the previous WSP. At worst. this is an error. At best it is archaic.	The previously prepared and approved WSP was used to compile information regarding the District. The reference to the Plat of Scatchet Hills Expansion was removed.
17	6	-	"The District intends to expand the service area to encompass properties to the southwest of the current western boundary, see Figure 1-2 below." This has also been referred to in the recent Davido-prepared Capacity Analysis. This reads as if the district has considered and agreed to expand in any way. Not only are they no records of such a decision having been reached but there are multiple references in meeting minutes to this expansion not being considered. Why is this in the WSP? Who has requested this be included? Where are the legal decisions backing this plan? What is the benefit to the district?	There has been no agreement to date to expand the water system. This would occur with the public discussion on the Water System Plan review. The commissioners did have concerns about water rates and the ability to fund the Capital Improvements Plan. While updating the WSP to properly identify system needs and identify associated costs of those upgrades; DCG has provided various methods for funding the noted improvements. Expansion of the water system and the increasing of water rates are two of the revenue streams available to the District noted in the WSP. There are multiple benefits to expansion of the system boundaries including the additional revenue source. This item has been highlighted to the board for feedback and comment.
18	7	1.10	Reads "Conditions of service are detailed in the "Application for Water Service" documents attached in APPENDIX A."	Section 1.10 has been updated in coordination with the District to reflect the applicable State Municipal Water Law and District. The reference to "Application for Water Service" has been removed.
19	8	-	Reads "The District has DOH approval for 451 connection but is currently seeking approval for an additional 108 connection (559 connections total)." Is this true? Has there actually been an application for additional 108 connections? If so why and where was that decision made? This contradicts on page 3 where it reads "The number of DOH approved connections is 451 connections. There are currently no pending requests for connections or annexations to serve property outside of the service area"	DCG was previously retained by the commissioners to perform a capacity analysis. This analysis and report have been completed and submitted to DOH. A portion of the WSP is an analysis of the capacity of the existing distribution system. The results of the capacity analysis are an accurate reflection of the current state of the system. The DOH approved connections is independent of the number of requests for service or the number of parcels served.

20	16	3.1.1.4	The penultimate sentence of section 3.1.1.4 "Disinfection Byproducts (DBP) reads "The treatment system does not use, so bromate does not need to be monitored." Does not use what?	The water does not use Bromine as an oxidant for water treatment; therefore, the system does not need to monitor Bromate. This sentence has been edited for clarification in the WSP.
21	24	-	Reads "A dedicated 6-inch fill line from Wells 2 and 3 to the reservoir site on Guemes Avenue was constructed in 1999". If this line was indeed constructed in 1999 this would be after completion of the previous WSP in 1998. Yet in the inventory of pipe on page 27. The total number of feet exactly matches that shown on page 9 of the 1998 WSP. How can this be true is a new, lengthy, dedicated line was constructed in 1999?	The inventory of pipe has been updated with the more recent records received.
22	2/24	Table 3-12	Table 3-12 "Source Well Withdraw Rate" - Well #3 is foot-noted as abandoned. This well is shown elsewhere as active.	The footnote was removed.
23	25	-	Reads "The storage capacity of the system is discussing the subsequent subsections." is discussed in?	The comment has been incorporated as noted in the WSP.
24	25	-	Reads "he system capacity was analyzed" [T]he?	The comment has been incorporated as noted in the WSP.
25	26	-	Reads "(section Error! Reference source not found. Above);" What does this mean?	The error message references a broken hyperlink. The link has been repaired in the document.
26	28	-	Reads "The system continues to strive to add piping to the distribution system and complete loops to provide a more reliable and efficient distribution system." Confusing...The system continues to strive? Perhaps the [district] does...?	The comment has been incorporated as noted in the WSP.
27	38	-	Reads "When the Guemes Avenue site is no in service the method to control the system with the level from the Maple Point reservoir/standpipe is complicated and inefficient. Additionally, the treatment system is entirely bypassed while the Guemes reservoir is not in service." On page 39. projects 13 and 14 appear to target this issue. is this correct? How are these 2 projects related and how do they differ? Why the huge difference in cost between them? Are both, or only one of them, required to avoid the problems encountered during the water tower project?	The sections regarding the functionality of the treatment system while the Guemes Reservoir is empty has been modified to more accurately reflect the current functionality of the system. Table 3-20 has been updated to reflect these changes and other projects. Project 13 would evaluate the configuration of piping with the treatment system to allow for its full functionality while the Guemes Reservoir is empty. It is anticipated that the necessary modifications for this project could be accomplished with a thorough analysis of the system and modification of piping in the Guemes Avenue pumphouse. Project 14 refers to how the current system functions in correlation with the wells and water levels at the Guemes Reservoir. Currently the Maple Point reservoir floats on the system and the wells aren't controlled by water levels at this reservoir. This project would provide additional functionality and control via the Maple Point reservoir. It is anticipated that improvements would likely involve the installation of conduit and controls from the Maple Point reservoir to the Guemes Avenue pumphouse with additional control upgrades at the pumphouse. The extent of these improvements reflects the difference in cost to project 13.
28	40	-	Reads "Meter readings are taken bi-monthly and are used to determine customer water use and charges." Are they not read quarterly? Contradicts page 69 where it reads "Meters are read and billed on a quarterly basis". Which is it?	See response to question 13

29	41		<p>Reads “The District’s most recently available 3-year annual average (for 2015-2017) indicates a distribution system water loss of 11.1%. Because this exceeds the 10% objective stated in Section 4.1, the District is advised to conduct a leak detection analysis of its system to identify and fix leaks” and “Estimates on the amount of water used during flushing operations will be used to determine the DSL rate.” Because the amount of water used in flushing is only estimated and not actually metered. It is possible that the leakage rate is understated (or overstated). What steps can be taken to eliminate estimates in favor of actual, metered results? Is there a project proposed that will accomplish this?</p>	<p>There is currently no project proposed in the WSP to measure flushing volumes. There are a number of methods to accurately estimate flushing volumes such as measuring the outlet pressure while timing the flushing time or comparing source meter readings on subsequent days. The Water System Plan includes various projects to address what are typically the major contributing factors to water loss in the distribution system including replacement of older failing water mains and replacement of malfunctioning water meters. Additional projects may be added to the WSP at the request of the board.</p>
30	41	-	<p>Reads “The District frequently includes informational brochures and/or letters on the need for conservation with customer billing statements.” Have lived in the district for 12 years and have never once seen any messaging regarding conservation, how to check for an eliminate leaks on individual properties. etc. Indeed, one huge concern is how little (read none at all) the district tries to engage the community.</p>	<p>At the direction of the board of commissioners, this statement has been revised to say, “The District will include informational brochures and/or letters on the need for conservation with customer billing statements on occasion. The District billing statements will also include periodic messages encouraging conservation.”</p>
31	42	-	<p>Reads “The District will relay information about upcoming water conservation speakers or meetings to their customers. The District will strive to schedule speakers for their annual membership meetings to discuss water conservation measures and benefits. The District will capitalize on studies conducted by larger water systems such as the Snohomish County PUD and the City of Everett and the Washington Department of Health. These studies will be used to evaluate the latest water conservation techniques. These techniques will be analyzed for their applicability to the District’s water system and how they may best be implemented.” Inconsistent and confusing use of the words “District” and “Association”. Others may have “associations” but we are a water “district”. Further, our district does not hold “annual membership meetings”. There are monthly public meetings and occasional special meetings.</p>	<p>At the direction of the board of commissioners, this statement was revised to say, “The District will strive to schedule speakers annually at one of their monthly meetings to discuss water conservation...”. The WSP has been edited for consistency in its references to the District.</p>
32	46	-	<p>Reads “A copy of the O&M Manual is included in APPENDIX L” When I search for appendix L, I find a section with this label but it reads “Hydraulic Modeling”. This is consistent with the information found in the list of appendices shown on page x near the top of the document. And in that list there is no mention whatsoever of an operations manual. it seems there should be an O&M manual. There was one in the previous WSP. Where is it?</p>	<p>The reference to the O&M Manual as an appendix in the WSP has been removed from the report.</p>
33	50	-	<p>Just above Table 6-3. it reads “In the case of an emergency, notify the Association’s Water System Management Company: Water and Wastewater Services, LLC.” Should this not be King Water Company?</p>	<p>The reference to the Association and Water and Wastewater Services, LLC. has been updated as noted. At the direction of the Board of Commissioners their email addresses are provided for an emergency contact.</p>

			The named company is similar but in Skagit County. In the previous plan the commissioners were on the list of contacts. Why not now?	
34	50	-	Regarding "Emergency Program", there is the 5-item, bullet list of methods for informing the community. How about using something more modern than 1960's technology on this list. How about email? How about text messaging? How about a phone call campaign? How about posting to a website? We already have an email list on hand and it has been used one time for notification of a minor "emergency" on 4/11/2519. Should our plan not even attempt to leverage this investment - not to mention call for a higher, more modern standard	At the direction of the Board of Commissioners, email has been added to the list. The "1960's technology" remains a reliable form of communicating in cases of emergency when power can be lost and phones and computer access may be unavailable.
35	52	-	Reads "As a condition of continued water service, the district will evaluate connection that had a potential change in use." [any] connection, [a] connection, [all] connections? Change i[n] use	The section has been revised for clarity.
36	56	-	Reads "Payment of the WSDOH review fees and expenses will be the developer's responsibility when the Developer initiates water system improvements. After construction is complete, and accepted by the Association, the Association will submit the following to the WSDOH" Inconsistent and confusing use of the words "developer" and "association". Are these meaning the district? Is the developer a contractor working on the system? Or is the developer the district?	Section 7.3.2 now refers to the District instead of the association for consistency. Developer would be a party extending service to a new area. This is consistent with the references to developer extensions noted in other sections of the WSP.
37	60	-	Reads "Currently the Maple Point Reservoir the reservoir was off-line for repair and recoating in 2018, the system was able to be served temporarily by the Maple Point reservoir but it was necessary to bypass treatment system due to the piping configuration and con" Not sure what this means. Perhaps the first instance of the phrase "Maple Point Reservoir" should refer instead to the "Guemes Avenue reservoir"? Incomplete sentence.	This project has been removed from Section 8.2.3 as it is reflected in other subsections of Division 8. Refer to Section 8.2.5 (Maple Point Reservoir Controls) and 8.2.2 (Treatment System Piping Configuration).
38	61	-	– Reads "The recommended secondary service would come via a directionally drilled HDPE water main from Hubble Court down the steep slope to the northern end of Driftwood drive." It is correctly noted that the slope is steep. Has anyone actually: a. Looked at the bluff b. Studied the many erosive events that have occurred on that bluff c. Realized the new "sewer district" has lines running up that bluff in relative proximity and that these lines have suffered breaks/leaks that have only recently been addressed (after the county was called in) d. considered what the effect of high pressure water might be on the bluff should a break occur there, considered the impact on the bluff-top property owners should the bluffs be made even more unstable and dangerous due to a water system problem. considered the financial liabilities to the water district should this happen	DCG observed the bluff and consulted geotechnical evaluations of the slope for both the sewer repair and for improvements on neighboring properties. The intent of WSP is to provide and list of capital improvement projects that the system anticipates over the next 20 years. A full engineered design would need to be undertaken for the majority of the projects listed in the Water System Plan including this one.
39	61	-	Reads "When the Guemes Avenue site is no in service" no[t] in service	The comment has been incorporated as noted in the WSP.

40	62	-	<p>Reads "Install an emergency generator at the booster pump station." At many meetings over several months, have heard Duffy talk about installing a generator and a valve for emergency distribution of water in 5-gallon jugs. Is this that project? In not, where is that project?</p>	<p>This section is in reference to the capital improvement project listed in the previous WSP. A project to install a generator to power the well field has been specified in the WSP as was suggested by the SHWD board.</p>
41	63	-	<p>Reads "Over the past couple years there have been inquiries regarding service from the Scatchet Head Water District from residences located off of Headlands Way." From whom did those inquires come and to whom were they delivered? It is understood that Headlands residences have their own wells already. Why should access to district facilities be required or desired? What benefit might there be to the district in expanding? By what decision of the district is this included in the WSP?</p>	<p>DCG has been made aware of inquiries regarding the ability to connect to the SHWD distribution system from various parties. As part of the WSP update the Department of Health requires a statement regarding requests for service.</p>
42	65	-	<p>Reads "The Scatchet Head Water District is a rate supported not-for-profit corporation incorporated in the State of Washington." it is not clear that this is the case. A search of corporations on the Secretary of State's for anything containing "Scatchet" does not produce an entry for the water district. it is possible that, as said on page 1, this is because the district is incorporated as a Municipal Corporation and those may not appear on that website. But there are distict differences between a Municipal and Not For Profit Corporation. It must be one or the other, not both. Trying to clear this up, a search of the Department of Revenues website for anything including "Scatchet" was performed and it does produce a result of the business license for the district. However, this result refers to the district simply as an association. So this does not seem to clarify the distinction. So far, no records at all have been found that demonstrate that any form of corporation was created. All corporations need to have a set of By-Laws and these have requested under the PRA from the district and from the state without any results. So this claim MAY not be correct and should be researched more completely.</p>	<p>The first paragraph in Section 9 has been revised for clarity.</p>
43	68	-	<p>Reads "Develop an Operating Budget". There is no evidence that budgeting of any kind has been performed within the district since that shown in table 5 of the previous WSP. PRA requests for budgeting documents met responses that no such documents exist. Common sense makes a complete lack of budgeting a questionable approach?</p>	<p>An updated 6-year operating budget has been included as Table 9-4.</p>
44	68	-	<p>Reads "Special assessments are primarily used for localized improvement projects where the property within the specified area is assessed in accordance with the benefits received." It seems clear from discussion at https://www.atg.wa.gov/ago-opinions/diking-drainage-and-flood-control-districts-counties-special-assessments that some types of special districts may use special assessments under specific circumstances. However water districts do not appear to be specifically mentioned. In past meetings, I have heard discussion that</p>	<p>Some water and sewer districts can use special assessments in various situations. The specific restrictions pertaining to the SHWD are outside the scope of this WSP. The WSP notes that the special assessments would require further research in order to assess their applicability to the District.</p>

			such assessments are NOT possible in our district that revenues may only be generated via water rates. So this is confusing. Are there precedents of water districts applying special assessments?	
45	71	-	Reads "This Water System plan was presented to consumers for the SHWD during their public meeting held on Thursday June 13, 2019" It is not clear if this is the case. If so. this is only a single month since the plan was delivered for consideration by the district. As delivered. the plan seems to contain many error of varying significance. Also, the timing gives no opportunity for the district to consider and offer modifications of its own, based upon its authority, prior to presenting a plan to the public. Finally. no public notice was given or the document made available for inspection.	As was discussed in the meeting when the draft WSP was presented to the SHWD Board, the draft WSP would need to receive public comment. A place holder for the date was provided in the WSP that would need to be updated once the date was finalized. The documentation from that meeting with consumers will need to be included in the WSP. Hence, the inclusion of these statements that will be updated as necessary for the final report.
46	1	1.1.4	In section 1.1.4 reads "King Water Company also handles the meter reading, billing and general accounting for the water system." With regards meter reading, isn't this performed by Bill Benshoof, a District employee?	The WSP is a compilation of the best data available to DCG. If there are corrections to the information, personnel, procedures, etc. the plans they can be updated if more accurate information is provided
47	4	Table 1.1	Table 1.1 contains a distribution system inventory. It lists the footage of each pipe size/material. The values shown here are identical to those shown in the original plan dated May 2019 which was, according to documents provided to the district at the July 11, 2019 meeting, supposed to have been updated. The values shown at this point do not match the totals shown in table 3-14 on page 28.	Table 1-1 has been updated.
48	5	1.5.1	Section 1.5.1 reads "The service area complies with the service area agreement recorded with Island County attached in APPENDIX A." No document titled/labeled Service Area Agreement is found in Appendix A. A page from the original Scatchet Head Plat has been added since the May 2019 version. But this makes no reference to a service area agreement and makes no comment whatsoever regarding the provision of water supply services. Resolution 98-5 has also been added. However it too lacks any mention of a service area agreement. Instead it speaks to adoption of an operations and management manual. I have checked that document and found no Service Area Agreement. The section says the Service Area Agreement is on file with County Health. But it does NOT appear to be contained in Appendix A.	We kept references to the franchise and service area agreement with Island County until we were able to obtain the necessary document from the necessary parties. The documents made available are now include in Appendix A as referenced.
49	6	1.5.2	Section 1.5.2 refers to "Plat of Scatchet Hills Expansion". According to documents provided to the District at the July 11, 2019 meeting, these references were supposed to have been removed. It has been removed in section 1.2.1 on page 2 but remains here for unknown reasons.	See item 16.
50	-	1.7	Section 1.7 refers to "Service Area Agreement" and states it is included in Appendix A. No document titled/labeled Service Area Agreement is found in Appendix A.	See item 48.

51	-	1.6	Section 1.6, Future Service Area reads "The District intends to expand the service area to encompass properties to the southwest of the current western boundary"	This section has been removed at the request of the Scatchet Head Water District's board of commissioners.
52	-	2.2.1	Section 2.2.1 refers to "Plat of Scatchet Hills Expansion"..	See item 16.
53	-	3.1.1	Section 3.1.1 reads "A selection of recent water quality test results are included in APPENDIX S". Appendix S contains test reports dated no later than the year 2002 and some as old as the year 1991. How can these be considered "recent" or useful in any way?	The testing schedules recommended by the state vary from monthly to once every 5-years. The test results now included in Appendix S are the latest result that could be located on the Department of Health database for each of the constituent testing areas.
54	-	3.3.1.4	Section 3.3.1.4 reads "However, as submersible pumps may fail at without much warning, therefore, adequate reserves should be kept on hand to fund a well pump replacement. "Perhaps should read "However, as submersible pumps may fail without much warning, adequate reserves should be kept on hand to fund a well pump replacement." (no "at", no "therefore").	The wording in this sentence, now in Section 3.3.1.3, has been modified for clarity.
55	-	3.3.3	Section 3.3.3 reads "The system capacity was analyzed using only the Guemes Avenue reservoir, since the Maple Point Drive only provide standby storage capacity." Perhaps should read "The system capacity was analyzed using only the Guemes Avenue reservoir since the Maple Point Drive reservoir only provides standby storage capacity."	The sentence noted has been updated.
56	-	3.3.3.1	Section 3.3.3.1 reads "It is assumed that one foot of elevation difference exists between the well pump on and off signals". Why is this "assumed"? Do we not know? How is this tested to ensure the assumption is correct?	The information in this section is based on the information available to the engineer. Assumptions can be verified by checking the exact reservoir levels and where controls are placed currently in the reservoir. This information can be updated as more information is made available.
57	-	3.4.1	Section 3.4.1 reads "Please see APPENDIX A for existing system information including copies of the well logs and the WFI. Reviewed Appendix A and do not see copies of well logs as stated. Appendix A includes something titled "Water System File Report". However, this does not appear to be the WFI - which is found in Appendix E".	The references to the appendices in this section have been updated for consistency.
58	-	3.4.1	Section 3.4.1 reads "See APPENDIX J for a copy of the system's water right." Appendix J does not appear to contain a copy of any water rights. It contains the "Wellhead Protection Program".	The references to the appendices in this section have been updated for consistency.
59	-	3.4.1	Section 3.4.1 reads "These areas are separated pressure reducing valves along Periwinkle Street, Fidalgo Street and Driftwood Drive." Note here and elsewhere that Fidalgo is a Drive and Periwinkle is a Road, not streets. Perhaps should read "These areas are separated by pressure reducing valves along Periwinkle Road, Fidalgo Drive and Driftwood Drive." (add by)	The references to these roads, streets, and drives have been updated for consistency.
60	-	3.4.4	Section 3.4.4 reads "A copy of the water right certificate for well #2 is provided in APPENDIX J" Appendix J does not appear to contain a copy of any water rights. It contains the "Wellhead Protection Program".	The appendices references in Section 3.4.4 have been updated.
61		3.5.2	Section 3.5.2 reads "The district should have a current hypochlorite treatment system analyzed to allow from future increase in production capacity." Perhaps should read "The district should have the current	The section has been updated as noted.

			hypochlorite treatment system analyzed to allow for future increase in production capacity." (replace a with the, replace from with for)	
62	-	3.5.4	Section 3.5.4 reads "... a replacement program should be started to plan for the orderly replacement... Perhaps should read "...a replacement program should be started to plan for the orderly replacement..." (replace started with started)	The section has been updated as noted.
63	-	3.5.4	Section 3.5.4 reads "This watermain is over 3,500 lineal feet as is at its expected lifespan." Perhaps should read "This watermain is over 3,500 lineal feet and is at its expected lifespan." (replace as with and)	The section has been updated as noted.
64	-	4.1	Section 4.1 reads "The SHWD has consistently encouraged water conservation through a variety of methods and plans." This is just not at all true. With the minor exception of a statement to conserve water in some letters related to the tank project, there has been virtually no action, encouragement, or communication on this subject from the District.	The WSP has been created to best help the District accurately account for their plans now and into the future. This section can be modified at the request of the SHWD Board of Commissioners.
65	-	4.1.1.2	Section 4.1.1.2 reads "It will also allow the Water System to monitor variations in per capita use for potential leak detection." While in theory this is true, in practice this is totally inadequate because meters on service are read only every quarter and this allows for up to 3 months leakage to occur unchecked before a water user may become aware of a leak. This is far too long and can permit far too much waste - especially given that many property owners live in other locations for 6 months per year or more. The level of leakage and the billing costs associated with this leakage has forced the District to implement a "leak credit" program which not only discourages awareness, proactiveness, and conservation but also reduces the District's revenues by forgiving not only the waste of water but also the costs associated with producing it.	The WSP has been created to best help the SHWD accurately account for their plans now and into the future. This section can be modified at the request of the Board of Commissioners.
66	-	4.1.1	Section 4.1.1. reads "The service and source meters have leak detectors." What is the nature of the "leak detector" on service meters? How do they work? How do they alert water users or the District? I have never been aware of any leak detection technology beyond the meter's read-out.	Consumers are advised to contact their water service provider with detailed questions regarding the exact functionality of the meters located throughout the system. The meter's readout is a primary form of helping identify leaks in services. All water usage can be stopped at a service and any movement in the flow indicator on a meter indicates unintended water loss or usage.
67	-	4.1.1.4	Section 4.1.1.4 discusses the Leak Detection Program. In part, this section reads "The District's most recently available 3-year annual average (for 2015-2017) indicates a distribution system water loss of 11.1%." It should be recognized the data is now available for the year 2018 which shows a leak rate of 15% bringing the 3-year average up to 13.6%. This information further highlights the need for the District to engage in some form of systematic leak detection and elimination.	The quantity of water loss has helped formulate the capital improvement projects listed in the Water System Plan including replacement of aging infrastructure, including water meters.
68	-	4.1.1.5	Section 4.1.1.5 reads "The water pressure within the District is maintained between 50 and 65 psi by existing buster pump stations and pressure reducing valves. Perhaps this should read "The water	The section has been updated as noted.

			pressure within the District is maintained between 50 and 65 psi by existing booster pump stations and pressure reducing valves." (change buster to booster).	
69	-	4.2.3	Section 4.2.3 reads "Currently there are no other know water systems" Perhaps should read "Currently there are no other known water systems".	The section has been updated as noted.
70	-	6.1	Section 6.1 reads "The contract between SHWD and King Water is included in APPENDIX A." There is no contract included in Appendix A.	This was a placeholder in the draft report for document that can be included in the Water System Plan. The reference to the contract has been removed until a copy of the contract can be provided to include in the Water System Plan.
71	-	6.3	Section 6.3 reads "Dead-end mains are flushed every two months." I personally live on what I believe is a dead end main on Periwinkle. There has never been flushing periodically every 2 months. It is true that during the water tower project of 2018, flushing was performed more frequently. Other than this, flushing has never been performed on Periwinkle every 2 months in the past 12 years of our residence.	The section can be updated at the direction of the District or SMA.
72	-	6.6	Section 6.6 has a 5-point list of actions to be taken in an emergency. According to documents provided to the district at the July 11, 2019 meeting, email was supposed to be added to the list. It is not in the list. In these same documents I read " At the direction of the Board of Commissioners their email addresses are provided for an emergency contact." I see no such email addresses in the July 2019 plan document. Also, this does not include King Water's after-hours phone number.	The notification method has been updated in section 6.6 and Table 6-3 has been updated with the email addresses of each commissioner. The contact list can be updated with any additional information at the direction of the Board of Commissioners.
73	-	8	Section 8 reads "The Scatchet Head Water District is currently approved for 401 connections according to documents from the Department of Health." In the Quick Reference on page iii, it reads "Current connections = 410 connections" and "DOH Approved Capacity = 451 Connections". This is consistent with statements found on page 3, 8, and elsewhere. Why is this saying only 401? This amount would be fewer than the current actual connections.	This statement as been updated for accuracy.
74	-	8	Section 8 reads "It is anticipated that the SHWD will potentially reach approximately 475 connections over the next 20-year planning period [year 2040]." It is not clear on what basis the number 475 is computed. On page 11, Section 2.2.2 it reads "Projected growth during Phase 2 will require service to an estimated 450 ERUs at the end of year 2039." This is a variance of 25 between page 11 and page 59. Which is the correct estimate and why?	The number of estimated connections in 20 years is supposed to be 455 connections as shown in Table 2-4 and Table 2-5. The appropriate value has been updated in both sections.
75	-	8.3	Section 8.3. This section is labeled "Selection of Alternatives". However, there is no discussion of alternatives to the projects identified in this WSP. Alternatives would have to include different approaches to solving the problems or limitations found in a system. There is no discussion of this at all. For example, the question of a	Section 8.3 outlines the some of the considerations considered when attempting to determine the Capital Improvements project. The projects were developed in conjunction with the Board of Commissioners, the SMA, and past Water System Plans approved by the SHWD. The intent of Section 8.3 was not to outline the numerable alternatives that have been considered

			secondary supply of water to Driftwood Drive is seen as needed project. The only approach mentioned to do this is to run a supply line over a steep and regularly shifting slope from Hubble Court. There is no discussion whatsoever of an alternative to this approach. It is likely that there are at least a couple other alternative means to solve this problem. There is no mention of them and how this single solution was determined to be the only one offered. Some may be easier, cheaper, and just as acceptable as a solution to the problem. With no identification of these options or discussions of their relative merits, there can be no real executive choice.	for the CIP. Even within each of the listed projects there are typically various alternatives that will need to be considered when developing a design, which process is outside the scope of the Water System Plan.
76	-	8.2.7	Section 8.2.7 reads "Developer extensions are listed in the CIP" The meaning of CIP is unclear. This is NOT included in the list of abbreviations found on page xi.	CIP is an abbreviation for Capital Improvement Plan. The list of abbreviations has been updated and the first reference to the Capital Improvement Plan in Chapter 8 has listed CIP as an abbreviation.
77	-	Table 9-1	Table 9-1. This breaks out both "Manager Salary" and "Meter Reading" These numbers, at least for the year 2018 which I have checked against expense vouchers and receipts in detail, seem incorrect. The manager salary seems to always amount to 30 hours every single month (winter/summer, rain/shine) and is always charged at \$20/hour. This yields \$600/month and matches the annual salary amount of \$7200 shown in the table. However, is it not the manager who reads the meters quarterly? In the vouchers there is no break out specifically for "meter reading" and no notations on the manager's "timeslip" showing meter reading at all. From where do these numbers come? Where is the legally required documentation to back up these claimed expenses?	Table 9-1 was compiled from data provided to DCG. The District's budget has been updated at the direction of the District's Board of Commissioners.
78	-	Table 9-1	Table 9-1 refers to "Water Fees" and "Taxes". Do "Water Fees" include the revenue from new connection charges? Are there taxes paid on new connection funds? If so, are these taxes included in those shown as paid in Table 9-1?	Table 9-1 was compiled from data provided to DCG. The District's budget has been updated at the direction of the District's Board of Commissioners.
79	-	9.5.3	Section 9.5.3 reads "The Water District should continue to monitor the system capital needs, revenue and facility requirements on an annual basis to help determine if the Share price should be modified." It is true that the new connection fee is currently \$5000. Are there regulatory constraints on the amount that can be charged moving forward? As the number of available connections (per currently authorized full build-out) declines, doesn't the value of each connection rise? The WSP makes clear that there are significant "capital needs" and "facility requirements". Why, given these factors, is there no analysis/recommendation to raise these fees now included.	The Water System Plan recommends the District hire a consultant to perform a water rate analysis. A full analysis of a rate structure and the appropriate method for determining the various fees are outside the scope of the Water System Plan update. DCG provided a recommendation regarding rates to assist the District in having a structure more consistent with the rates of utilities that have more data available. A revised rate structure has now been approved by the Board of Commissioners and Chapter 9 has been updated with that information.
80	-	Table 9-4	Table 9-4 Future Six-Year Operating Budget. 1. Other than revenues conforming to the proposed rate changes, what assumptions and consideration was given to the development of this budget forecast? 2. Especially in consideration of expenses, it appears that many items	The budget is a compilation of the data made available to DCG in developing the Water System Plan. The budget should reflect the goals and costs that the District anticipates over the years listed. The values can be updated, modified, and additional costs accounted for at the request of the Board of

			<p>are forecast as the simple average of the prior 4 year's actual values and, once computed, many such items are simply assumed to remain constant over the 6 year period. In this the computation employed? Is it really safe to assume these items impervious to inflationary pressures? 3. One item in particular, "Commissioner's Pay" is held constant at a \$4000 level that is lower than the actual \$4186 expense for this item in 2018. These salaries are subject to revision at the state level and are certainly bound to increase over the period. 4. It is not clear to what the item "Capital Improvement" refers. The textbook definition of this term is "the addition of a permanent structural change or the restoration of some aspect of a property that will either enhance the property's overall value, prolongs its useful life, or adapt it to new uses." With the many projects identified in the WSP, it would certainly seem like there will be significant capital improvements over time. In 2015, there is \$2450 shown as spent. But in the budget forecast there is no expenditure whatsoever.</p>	<p>Commissioners or the District's SMA. As the report notes, "Updates to the budget should be completed at least every three months, including impacts from projects and activities identified in the utility's WSP."</p>
81	-	10.4	<p>Section 10.4 reads "The Water District's Service Area Agreement was revised during the creation of this document to reflect the current parcels served and future parcels that may be served by this system and adjacent water systems. A copy of the agreement is attached in APPENDIX A." No document titled/labeled Service Area Agreement is found in Appendix A.</p>	<p>We kept references to the service area agreement with Island County until we were able to obtain the necessary document from the relevant parties. The documents made available are now include in Appendix A as referenced.</p>
82	-	App. B	<p>Appendix B - Water System Maps. It appears that all maps/diagrams included in this appendix originated in the last Water System Plan and are dates 1997-1999. Has there been any effort to update any maps to include changes from that time? If so, this is not apparent.</p>	<p>The maps are a compilation of the data available at the time the Water System Plan was updated. These maps include data from the last Water System Plan and as-built drawings from improvements that occurred after that Plan's development. Developing updated as-built drawings for the entire SHWD is outside the scope of work for the updated Water System Plan.</p>
83	-	App. C	<p>Appendix C – Titled "Service Area Maps". This appendix contains only a single map. Should it contain more? If not, should not the title be "Service Area Map"? As is, the reader is left confused</p>	<p>Currently there is only one map in Appendix C. It is anticipated that other maps of the service area exist. Those maps should be included once or if they are located. Updating the documents available will greatly assist in the updating of the Plan in future years and in any necessary coordination with the county or state.</p>
84	-	App. Q	<p>Appendix Q – Titled "DOH Sanitary Survey". The first page shown is dated May 19, 2015. The remaining pages in this appendix are dated May 10, 2019. How can this be?</p>	<p>The sanitary survey included in Appendix Q is the latest one provided to DCG while developing this updated plan. DCG has not consulted the state regarding discrepancies in the dates provided.</p>
85		8	<p>Planning Phase 1 – 2020-2026 – The Scatchet Head Water District is current approve for 401 connections, according to documents from the Department of Health (DOH). However on page 9, the table shows 409 single family residences and 1 non-residential connection for a total of 410 connections. Is the system in compliance with the DOH document?</p>	<p>This reference has been updated in the report. The district has 410 active connections and is currently approved by the DOH for 451 connections.</p>

86	-	8	Planning Phase 2 - Demand for water is shown on page 11 as continually rising. However if development is limited by septic drain field requirements, why does the projection for water demand continue to increase from 2019 – 2039? Why does it not level off?	Figure 2-1 projects Demand based upon the District’s available ERU’s, calculated ADD for the system, and the annual projected increase in demand on the system. The projections assume that system will slowly increase to serve the number of lots in the system. The projections don’t account for current septic drain field requirements as how those will be affected by new technologies over the coming 20 years is difficult to project.
87	-	8	Why does Planning Phase 3 demand continue up to 559 connections if there are no new wastewater treatment facility planned? There should not be a continued build-out of water supply if sewage cannot be managed. The water district is projecting that there will be increased need for water during the Pase 3 period, but perhaps if water is limited, development will also be limited. Work with local planning boards to ensure that you are not planning for a water capacity expansion that will never happen.	Phase 3 as noted in the WSP, Chapter 8 is not making a projection as to water demand it is simply stating the results of the capacity analysis that demonstrate that the total number of connections that can be supported by the distribution system, in its current state, is 559 connections. Since the anticipated full build-out of the system will not occur in this time period there are not any proposed projects to meet additional demand (increased storage, additional water rights, etc.)
88	9	-	Supply can be enhanced through continued attention to conservation and to limiting water loss. On page 9, there was a water loss decrease in 2013-2015. What caused this? Was there a line replacement?	This question has been referred to SHWD and King Water for system history regarding repairs.
89	-	-	How is water loss calculated? Is this a direct measure based on the water withdrawn from the wells (minus water used for backwash) compared to the water usage billed to customers?	The method described is the typical process in calculating water loss. This question has been referred to SHWD and King Water to verify processes employed.
90	-	-	Accurate measurements of water loss are important. Leaks from pipes can contribute to weakening slopes and can lead to landslides on our bluffs. How has the WSP been linked to the newly released Scatchet Head geo survey of the bluffs? Is there an analysis of the risk from water pipe leakage and unstable bluffs? How can these two reports help prioritize infrastructure improvements?	The linking of the WSP to the geological surveys and an analysis of the risk from water pipe leakage and unstable bluffs is outside the scope of this plan update. The District should employ all resources available to it help determine its CIP priorities.
91	23	Table 3-10	Wells 2 and 3 are at different depths (295 ft and 403 ft, respectively). Are these different aquifers?	Table 3-11 (previously 3-10) has an additional row added for dilled depth and well depth as those values can and do differ on Well 3. Well 3 was installed at a depth of 246 feet although it was drilled to 403 feet. Most of the wells in Island County obtain water from the sea-level aquifer located in the interval from about 30 feet above sea level to 200 feet below. These wells are located in the same aquifer as probably 90% of wells on Whidbey Island.
92	-	-	There is a reference to different pumping rates of 150 gpm and 80 gpm. However the permitted level of withdrawal is only 125 gpm. Are we exceeding the permitted level? There is mention of needing to throttle the pumps. How is this controlled? Is it manual or electronic? If the SCADA system is pursued, will that ensure that water withdrawal is controlled so that permit levels are not exceeded?	It is our understanding that the withdrawal rate does not exceeded the permitted withdrawal and that the 150 gpm pump is throttled as necessary. The method of throttling the well pump has been referred to SHWD and King Water for a more detailed answer on system functions. The SCADA systems functionality and interaction are currently undetermined. SHWD should work in conjunction with King Water to determine the functions and data that should be logged in order to provide the best value for the District in maintaining the distribution system.
93	-	-	Need for emergency generator – are you considering gas (propane) or diesel? Remember, emergency generators require weekly testing so	This is a project identified by the SHWD Board of Commissioners as a need in the future. The District should work with qualified professionals and King

			you can be sure they are reliable when the power goes out. Will this be automatic or will someone need to perform the testing? How will you know if the test reveals that the generator requires maintenance?	Water to determine the appropriate generator and to ensure the operation and maintenance of the system meets future needs.
94	-	-	Not addressed in the plan: Is there pipe scale? Iron in water can accumulate on the inside of pipes, partially occluding the flow. Is this the case with our pipes? When there is a pipe break and repair, what is observed? Does iron accumulate on the valves, causing their eventual failure?	The WSP references the District's Operations and Maintenance Manual. Proper maintenance of the distribution system should help reduce the effects of pipe scale in pipes and valves. This includes exercising of valves and scheduled flushing of the system.
95	38	-	On page 38 there is reference to a 2 inch water main that is no longer buried. On page 62, there is reference to a 6 inch main that is exposed. Please clarify.	When DCG was initially informed regarding the need to include a project for exposed water lines, the information was that the lines were 2-inch. After initial drafts the actual locations were identified, and further investigation identified the areas as 6-inch mains. This reference has been updated for consistency with the other references in the WSP.
96	38	-	On page 38, there is a mention that the water main for Driftwood is at its expected lifespan. However, there is no listing of all of the pipes/valves and their expected lifespan. Is there an asset management plan which takes account of the expected lifespan and plans for replacement?	Appendix O provides a breakdown of the various elements in the distribution system, anticipated lifespan, current age, and replacement costs. Valves will be replaced when mains are replaced or as identified during routine maintenance.
97	-	-	Is there a list of where leaks/ breaks have occurred? Are there trends that can be discerned? Is this used in prioritization of replacement piping/valves?	Detailed information on leaks and breaks have not been provided to DCG and are not included in the WSP. Prioritization of the CIP was made by consulting with the SHWD Board of Commissioners, King Water, and a review of the lifespan of system components.
98	62	-	On page 62, there is a reference to creating as-built drawings of the pipes. Does that mean that as-built drawings of the entire system are not available? Are only some of them missing? How can the pipes/valves be tested (part of operation/maintenance) if not all are accounted for on drawings? Is there a plan for creating as-built drawings for the entire system? What is the time-frame?	As built drawing for the system were created in 1997 and are included in Appendix B. There have been various projects on the system since those were developed and as-builts for those projects have also been included in the Appendix B. Development of new as-built drawings for the entire distribution system are outside the scope of the WSP update. The anticipated timeframe for developing new as-built drawings will be referred to the SHWD Board of Commissioners and King Water.
99	-	-	The 2 inch line on Periwinkle may not be sufficient for the water usage in that area once full build-out of the vacant lots is achieved. This should be evaluated. Additionally, that line should be flushed more often because if there is a buildup of silt, the line could be blocked. This should be addressed in the plan.	Project 6 and Project 9 in Table 3-20 are both incorporated to help address current concerns on Periwinkle. SHWD and King Water should ensure that the flushing plan and schedules recommended in their O&M Manual are followed, evaluated, and updated as necessary.
100	63	-	Is there a list of the meters that are functional and those that are not functional? Is there a schedule for replacement of water meters? How many years before all water meters will be replaced? How are the meters read? How much revenue is being lost by not being able to accurately bill for water usage? How much water loss is unaccounted for?	Malfunctioning meters are a common source of water-loss in distribution system. The WSP recommends implementing a plan to evaluate meters and replace those that are no functioning properly. The timeline will need to be determined by the SHWD and King Water in conjunction with goals and budgetary constraints. The amount of lost revenue is dependent on various factors that are currently unknown.
101	21	-	There is a note about exceedances of Volatile Organic Compounds (VOCs). Quarterly sampling is now required. Why are VOCs present?	THMs and HAA5s are byproducts of the necessary disinfection that occurs by the addition of chlorine to the drinking water for the SHWD. These are commonly referred to as disinfection byproducts (DBPs). The removal of

			What sources are in the area? Will VOC removal be required in the future? How is this addressed in the plan?	DBPs typically occurs by removing the organic substances that react with the chlorine, but other methods can and should be evaluated. The WSP (Project 8 in Table 3-20) recommends an analysis of the current treatment system.
102	-	-	Is there any chemical addition prior to filtration to reduce iron and manganese? The DOH inspection report dated 5/22/2015 indicates that air is injected prior to BIRM filtration for iron and manganese removal. Yet, it is my understanding that there is also some Chlorine addition to help oxidize the iron and manganese so they will precipitate. How do you know that there is enough Chlorine addition for complete oxidation? Could incomplete oxidation be the cause of the brown water which residents experience?	Iron and manganese in water are oxidized by chlorine, converting to ferric hydroxide and manganese dioxide. The precipitated material can then be removed by filters on the system. As noted there have been other treatment methods employed on the system previously that are no longer employed on the system (ozone injection, air injection, etc). The report recommends an analysis of the treatment system to ensure it is meeting the treatments goals of the distribution system. Testing prior to and following treatment can assist in ensuring that the processes are working as desired.
103	-	-	Why was the ozonation plan abandoned? What lead to that decision? Should that be revisited?	Decisions regarding the installation and removal of Ozone injection as a form of oxidation was made prior to DCG's relationship with SHWD. It is our understanding that the ozone BERM system was problematic in maintenance, expensive, and didn't function properly for the water system. Chlorine and ozone have additional complications including the creation of additional DBPs. Many water purveyors have removed ozone treatment from their distribution systems for these and other reasons here on the Whidbey Island. In our experience working with water systems in the area revisiting the Ozone BERM system would not be an advisable use of District funds.
104	-	-	Where does the filter backwash go? Is there a National Pollution Discharge Elimination System permit for the discharge? How often are the filters backwashed? Is there a buildup of contaminants on the property where the backwash is disposed which might require cleanup in the future?	The following is the information that has been conveyed to DCG during the development of the WSP: Currently there is a pond located by the pumphouse on Guemes Avenue which receives water from the filter backwashing process. This water is used to irrigate a neighboring park since the original form water disposal via a swale was adversely impacting downstream properties. There is not a NPDES permit for the discharge. Project 4 in Table 3-20 addresses the need to evaluate and modify the current method of backwash water disposal. The amount and timing of the filter backwash should be evaluated as recommended in the WSP and in the latest Sanitary Survey provided by the state.
105	-	-	The main complaint that I hear from my neighbors is that the water is brown. If the SCADA system were installed, would there be better control of the plant? Could you take corrective actions when the water system is our to balance to better address complaints? Could you install an optical sensor to tell you when the water is brown? The SCADA system is not very on the priority list, but if it were to improve operation of the facility, it may be a higher priority for your stakeholders. However, automatic system pose their own problems. Cost and benefits should be carefully weighed.	The full potential of the SCADA system are partially determined by the amount of money that the District is willing to invest in the system. System very is cost from \$10,000 to millions of dollars depending on the functionality one desires. As noted in the response to question 8, SHWD should work in conjunction with King Water to determine the functions and data that should be logged in order to provide the best value for the District in maintaining the distribution system.
106	-	-	Sampling is a very good way to determine the effectiveness of treatment. The DOH recommended that manganese samples be collected before and after filtration to determine the effectiveness of	The testing protocols recommended by DOH and as outlined in the WSP should be followed. As noted in the report a thorough analysis of the treatment system is recommended as part of the CIP. Past testing and

			the filtration system. Consideration should be given to a comprehensive sampling program that would serve as a check on the systems functionality for better prioritization decision-making.	analysis are some of the reasons that the ozone treatment system is no longer installed on the system.
107	-	-	There appears to be no way to determine the water level in the reservoir tank on Guemes Ave.	This concern has been conveyed to the SHWD Commissioners and King Water.
108	47	-	Page 47 – valves are “periodically” operated. Is that daily? Weekly? Monthly? Quarterly? Annually? How often are fire hydrants operated? How often is the system flushed? Should there be additional flushing which takes place in winter when there are fewer residents? Should some hydrants be scheduled for more frequent flushing that are on dead-ends (such as Whales Tail and Driftwood) to ensure proper water circulation? Is water quality testing conducted more frequently at these dead end locations due to the increased probability of water contamination?	The SHWD should follow its Operations and Maintenance Manual. This includes exercising of valves and schedule flushing of the system. The effectiveness of the current maintenance protocol should be continually evaluated and modified as necessary to ensure the continued maintenance of the system. Most water system will exercise valves on at least a yearly basis. Dead-end lines are noted in the WSP to be flushed every two months. Hydrants should also be used on at least a yearly basis to exercise valves and allow larger PRV to fully function.
109	-	-	Application to the State Revolving Fund should be seriously considered. There are Safe Drinking Water Funds available, and other facilities on Whidbey Island have taken advantage of them. With the kinds of costs that are contained in this report, federal and state funding would be useful.	See section 9.3.3 of the WSP.
110	-	-	Typos: (1) Page iii, last line, page number missing (2) Page 21, asbestos, last line – something missing	These items have been updated as noted.
111	1	1	Before the WSP draft was submitted to the State Dept of Health, were all the numerous mistakes, typos, misleading and/or incorrect statements corrected as supplied in writing by resident/customer David White via spreadsheet in the July and August 2019 monthly meetings, or did they receive the uncorrected draft version? Specifically did the DOH receive the updated WSP updates for 9 & 10 that were issued last night, 9/4/2019 updating the previously incorrect financial information?	All comments that were provided to DCG were addressed prior to the submission of the approved Water System Plan to the DOH for initial review.

112	6	1.6	<p>On page 6 of the hard copy version, 1.6 Future Service Area, the W5? indicates it intends to expand the service area. Given the aged and decrepit infrastructure, how can it be advisable for any expansion that might push the existing service/capacity to its limits/breaking points? Has a thorough cost/benefit analysis been performed that might show how little added revenue or income might be gained at the expense of putting the existing system in jeopardy? Where is the documentation about the type and number of requests for expanding the service area when District Meeting Minutes over years clearly show the Commissioners NOT BEING IN FAVOR of expansion?</p>	<p>Prior to commencement of the WSP update DCG had been consulted on various methods to improve the financial position of the Water District. Some of the methods discussed were to expand the number of customers paying into the system and modifying the billing of customers. The capacity analysis of the system indicates that the system in its current state can support additional connections. Therefore, initial drafts of the WSP submitted to the Board of Commissioners for review included these options. At the request of the Board of Commissioners the expansion to the service area was removed from the WSP draft</p>
113	16	3.1.1.3	<p>On page 16 of the hard copy version, (Section 3.1.1.3 Physical Characteristics, on regarding water hardness, the WSP indicates it uses "samples are about 20-years old". Why is this? What good is a 20 year old sample for a new WSP? Why are the samples not current or at least close? How can this meet the criteria for an UPDATED WSP when some key samples are 20 years old??</p>	<p>The testing schedules recommended by the state vary from monthly to once every 5 years. The test results now included in Appendix S are the latest result that could be located on the Department of Health database for each of the constituent testing areas. The updated WSP is a compilation of the latest data available.</p>
114	20	3.1.8	<p>On page 20 of the hard copy version, 3.1.8 Backup Power Requirements, the WSP indicates the need to install a generator for to allow the wells to be active in case of an extended power outage of over 2 days. This has been talked about for many years and nothing accomplished. In many areas during Winter of 2019 Scatchet Head did experience extended power outages over 2 days. Why is this not a higher priority (immediate or near term vs. midrange) as indicated on page 60 under System Improvement Projects</p>	<p>The projects outlined in Table 3-20 were developed by analyzing the system, review the previous WSP, and consultation with the Board of Commissioners. The prioritization of the projects can be modified at the request of the Board. In addition, various project may have to be prioritized sooner or later than is projected due to system constraints, finances, and community feedback</p>
115	37 61	3.5.2 8.2.2	<p>On page 61 of the hard copy version, under 8.2.2 Treatment it states under Treatment System Piping Configuration - Future Planning Period that during the Guemes Ave reservoir off line repair project, "it was necessary to by-pass the treatment system due to piping configuration". This is what caused a great many problems for many customers during that time, some of which continue. (This is also mentioned on pg 37 in 3.5.2 Treatment Needs where it suggests piping configuration is problematic). Bypassing treatment is in DIRECT CONTRAVENTION to the 2015 Dept of Health Sanitary Survey findings of DEFICIENCIES on page 52 where it states: "TREATMENT BYPASS SHOULD NOT EXIST, WHILE ONLY CHLORINATION IS REQUIRED, THE TREATMENT THAT HAS BEEN INSTALLED IS REQUIRED TO REMAIN IN USE. YOU SHOULD LOCK AND TAG THE BYPASS VALVE TO AVOID INADVERTENT BYPASSING OF THE TREATMENT."</p>	<p>DCG first received a copy of the Sanitary Survey in preparation of this WSP update. The issues encountered from the operation of the system during and following the reservoir coating project have influenced various projects in the WSP.</p>

			<p>The DOH sanitary survey were well known years in advance of the Guemes project, yet apparently deliberately defied or ignored or both. What confidence should customers have in a District and its Engineers who fail to follow the Dept of HEALTH requirements? And when customers complained, as we and many of our neighbors did, we were told the brown, smelly, disgusting water was safe to drink and when we complained of skin rashes or adverse reactions, we were told the water could not be the source. The District Commissioners who led that project should be held accountable along with its Engineers</p>	
116	Q		<p>On pg 2 of the Dept of Health Sanitary Survey exhibit, it notes "Well 3 exceeds the arsenic standard and therefore is only used seasonally to supplement the demand". Was this used during the Gnomes tank project and may have been a source of customers health complaints? Also on pg 7 it notes the Gnomes Ave Reservoir is NOT SEISMICALLY SOUND. Was anything done about this during the reservoir refurbishment project and if not, why not? Also on pg 8 under Maintenance that the Structure in good condition is marked NO. It goes on to say on pg 9 that the reservoir at the treatment plant site is 'In need of structural evaluation"...which clearly precipitated the tank project but was a complete structural evaluation completed and if so, did it include seismic?</p>	<p>DCG first received a copy of the Sanitary Survey in preparation of this WSP update. The District's response to the Sanitary Survey are outside the scope of this WSP Update.</p>
117	Q	-	<p>On page 12 of the Dept of Health Sanitary Survey exhibit under Section 9 System Management & Operations it states: "The board has remained the same over the years..." however the author states concerns "over long range planning of the water system and the board's ability to recruit more active members. It is apparent that this system will need to invest in maintaining their water system infrastructure and will likely be facing significant replacement costs in the future. You need to start planning for those so that you can be prepared and make sure your rates will cover the financing of the infrastructure replacement".</p> <p>► Two board members are aged 90+ and 80+ respectively, and have served for 20+ and 10+ years respectively, overseeing a period of zero rate increases and what can only now be seen as seriously aging infrastructure without adequate reserves to address the situation. In the 2015 Sanitary Survey, the State noted concern over these issues. And in the intervening 4 years, nothing has changed.</p> <p>A. Why is Commissioner Schoeler (age 92) running for office again for a six year term when he stated in several meetings he was not going to, and why in particular is he running in opposition to Scott Carr who is a knowledgeable, actively involved Commissioner, and who meets the criteria the DOH recommends? This appears intentionally obstructive to the District's best interests of moving forward, stepping aside for qualified leadership and attempting to</p>	<p>This is outside the scope of the WSP Plan update. The question has been referred to the SHWD Board of Directors.</p>

			make up for lost progress during Schoeler's already over extended tenure	
118	Q	-	<p>On page 12 of the Dept of Health Sanitary Survey exhibit under Section 9 System Management & Operations it states: "It is apparent that this system will need to invest in maintaining their water system infrastructure and will likely be facing significant replacement costs in the future. You need to start planning for those so that you can be prepared and make sure your rates will cover the financing of the infrastructure replacement".</p> <p>a. How is the rate increase now being proposed, going to meet the infrastructure replacement demands? It seems wholly inadequate since the District has been operating w/a deficit in 2018 and beyond, and given net income declines enumerated in Sections 9 and 10 of the revised WSP?</p> <p>b. On pg 71-72 of the hard copy WSP, under 9.5 Rates, and Potential Water Rate Structure, why is the SHWD not charging rates similar to those cited from the Oak Harbor and Skagit County PUD? Why are our rates so abnormally and ridiculously low? We are not even paying ONE CENT per gallon!!!! What planet are the Commissioners and its Engineers living on? No one would expect to pay so little for such a critical resource. This is irresponsible and inconceivable. People think nothing of paying \$3 a gallon for gas, but a PENNY per gallon of water is supposed to be rational????????</p>	The rates for water in the District are a decision of the SHWD Board of Directors. The WSP reflects the decisions of the Board.
119	-	-	The water system plan has already been approved by the commissioners for sending to the State by Davido. Why would this be approved for sending to the State BEFORE this meeting for public input is held? This seems out of order.	The WSP has been sent to local and state agencies for review. The community has been provided a copy of WSP in accordance with state requirements.
120	-	-	The water system plan that was approved contained many errors/issues. Alone, I submitted 9 pages at the August meeting. Have all of these been addressed/corrected? If not, why not? After 20 years without a revision to the plan, why are we in such haste that we haven't the time to create at least an error-free document for the State's consideration?	Preliminary drafts of the WSP were provided to the SHWD Board of Commissioners as requested. The process of creating an error free document entails drafts, reviews, and modifications as has been performed for the WSP that was sent to the State.
121	-	-	The water system plan that was approved contained an entire section relating to financial matters including proposed changes to the water rate structure and shows a budget based upon the proposed changes. These proposals were never discussed at a meeting and the commissioners approved an entirely different rate structure. Despite this, the plan document that was approved for sending to the State and also distributed prior to this meeting contains the originally proposed rate structure and not the one approved by the	The WSP sent to the state incorporated all requested modifications, including changes to rates and budgets. The WSP will be reviewed by state and local agencies as required by the Department of Health.

			commissioners. Only 24 hours before this meeting date/time, a revised version of this section was made available. How is the general public supposed to review and provide meaningful comment tonight with so little time for review and consideration? When and how will the revised document be approved?	
122	-	-	The plan document that was approved contained several references with regards expanding the district’s geographic region beyond its current boundaries. It is clear that the commissioners considered this and approved a Capacity Analysis at least in part to verify its technical feasibility. However, I have found nothing in the meeting minutes to indicate that the commissioners have approved such an expansion. On the contrary, anytime this topic has been brought up and the commissioners have had the opportunity to address a proposed expansion, negative comments were made and no action has been taken. Why then do these references remain in the approved plan? It has been said by Davido that the main rationale for expansion is increased revenues. Where is the financial analysis that demonstrates revenues substantial enough to warrant the expansion? By my count, there are 17 parcels in the proposed expansion area. Of these, no fewer than 10 already host homes and therefore must already possess a water supply. Why would these owners wish to join the district? How many owners in the area have contacted the district? Who are they and when did this occur? Were these requests made formally to the district commissioners? If not, why do the references to expansion remain in the plan?	The approved WSP removed references to expansion per the request of the SHWD Board of Commissioners.
113	-	-	The approved plan document proposes at total of \$1.9 million in needed projects over the plan’s lifetime. Specifically, it lists “immediate” projects having at most a 1-year time frame calling for - at minimum - \$258,000. It also lists “near term” projects having at most a 2 year time frame calling for at least another \$427,500. Ignoring for now the projects specified for longer term time frames estimated at an additional \$1.2 million, how are the projects planned for the next 2 years-estimated at minimum to cost \$685,000 - going to be funded? It is clear from the rate structure shown in the newly updated sections of the plan that water rates alone will not suffice. And the “analysis” that led to the this rate structure relies on the most optimistic assumptions, for example, that all aspects of district expenses remain unchanged, that unpaid receivables will not rise, and that all revenue increases will be put available for immediate and near term projects and not consumed in increased maintenance expenses. None of these seem reasonable assumptions. Davido said at the July 2019 meeting that as our system continues to age in place and we can expect more and more leaks and other failures that will require attention. But even given these optimistic assumptions, the total	The WSP reflects the current rates and fees approved by the SHWD. Decisions regarding rate changes should be referred to the SHWD Board of Commissioners.

			<p>amount of projected net revenues over the coming 2 years is only \$100,504 – not quite 15% of the required amount for the planned projects during that time. How will the district pay for these “immediate” and “near” term projects? Conservatively, a loan in the amount of only \$600,000 spread over 20 years at 2.5% would result in monthly payments of about \$3,200 or \$38,400 annually. This would consume the majority of projected net annual revenues and seriously test the limits of the optimistic assumptions being made. Further, the loan liability for the remaining 18 years would all but preclude additional loan financing of the remaining \$1.2 million in longer term projects outlined for the 20 year term of the proposed plan. The proposed 6-year budget indicates no rate increases beyond 4 years. How is this plan going to address the huge shortfall? We cannot say we are planning and simply ignore these financial realities.</p>	
124	-	-	<p>It is my understanding that revenues from the sales of water shares/hookups are NOT included in the historical and projected budgets and that they are instead directed to the “emergency” fund where they remain. It is understood that the current price of a water share/hookup is \$5,000 and has been raised within the last few years. As the number of available water shares decline, doesn’t it make sense to increase the price of each of the diminishing number of water shares? If ever the district faced increased demands for what the approve plan calls “system capital needs, revenue and facility requirements” this would seem to be the time.</p>	<p>The budget provided in the WSP is that approved by the SHWD. This budget should be regularly evaluated to ensure it is meeting the needs of the District.</p>
125	-	-	<p>Shouldn’t a long term plan also address matters of succession planning for staff? In the last Sanitary Survey of 2015, the State made note of the matter of age in our district management. Our “District Manager” will soon be 82 years of age. Our previous “District Manager” was kept on staff to an even higher age. While I am sure this is an unpleasant thing to consider, isn’t it fairly obvious that, given these realities, the district should put together and begin executing a succession plan so we are not left with a sudden void in management?</p>	<p>This is outside the scope of the Water System Plan. The comment has been referred to the SHWD Board of Commissioners.</p>
126	-	-	<p>The approved plan discusses leaks to a limited degree. But, it quotes a now outdated figure of 11.1% for leakage. The most current figure has climbed for 2018 to 15% with a 3-year average of 13.6%. Davido said at the July 2019 meeting that as our system continues to age in place we can expect more and more leaks and other failures that will require attention. Other than simply replacing large components of the water distribution system in high cost projects, what measures can be taken to analyze and locate the sources of high quantity leaks so these can at least be repaired?</p>	<p>The WSP includes the most up to date data available at the time of the update. The O&M Manual should be followed to identify and track failing infrastructure.</p>

127	-	-	In the 1998 system plan, a project was identified to acquire and install an auto-dialer intended to notify system management under certain operational conditions. Was this installed? If not, shouldn't this be added to the list of needed projects? The expenses for the district include telephone bills. Are these to support the auto-dialer? If so, how often and how many times has the auto-dialer been engaged to report problems? What sorts of problems does it report?	The information available indicates there is an autodialer on the system. The question regarding how many times it has been engaged will be referred to King Water Co.
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APPENDIX U Correspondence

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✓Required	Content Description	WSP Page #
Chapter 1	Description of Water System	
(✓)	Ownership and management	1-2
(✓)	System history and background	2-3
(✓)	Inventory of existing facilities	4
(✓)	Related plans: Coordinated Water System Plan (CWSP), Comp./Community	5
(✓)	Information & DATED Maps: Service area, retail service area, designated land use and zoning, future comprehensive plan request for changes to land use, & agreements for plan approval period	5-6
(✓)	Policies: Service area, SMA, conditions of service, annexation	7
(✓)	Duty to serve ★ requirement: identify process, timeframes, conditions, appeals	7
(✓)	Consistency from local planning ★ agency (new LGC form to use)	7
Chapter 2	Basic Planning Data	Chapter 3
(✓)	Current water use: Population, customer classes, & ERUs	8
(✓)	Demand forecast for plan approval period (up to 10) and a minimum of a 20 year period* for population, service connections & demand forecasts with & w/o expected efficiency savings	10
(✓)	Monthly and annual production. Totals per source. Water Supply Characteristics & Demand Characteristics (see Ch.4). Add subtitles with description & discussion on effect of water use	10-11
(?)	Annual usage for water supplied to other systems	n/a
(✓)	Annual usage by customer class.	40
(✓)	Historical total water loss (DSL) – percent and volumes	9
(✓)	>1000, seasonal variations in consumption by customer class	10-11
Chapter 3	System Analysis	
(✓)	Capacity analysis with water right self-assessment (3 forms DOH/ECY per MOU): Existing, plan approval period (up to 10) and 20 th year projections	28-36
(✓)	System design standards	13-20
(✓)	Water quality analysis	21-22
(✓)	System inventory, description and analysis	Section 3.3
(✓)	Source	22-24
(✓)	Treatment	25
(✓)	Storage	25-27
(✓)	Distribution system/hydraulics	27-35
(✓)	Summary of system deficiencies	36-39
(✓)	Analysis of possible improvement projects	36-39
Chapter 4	Water Use Efficiency Program and Water Resource Analysis	40-44
(✓)	Water Use Efficiency Program per WAC 246-290-810	40
(✓)	>1,000 Estimate water savings from measures past six years.	
(✓)	If DSL is > 10%, water loss control action plan required for compliance with a schedule & activities to minimize leakage in budget	40-42

√Required	Content Description	WSP Page #
(?)	Source of supply analysis: evaluation of supply alternatives if pursuing addt'l water rights in next 20 years	<u>42-43</u>
(?)	Interties	<u>43</u>
()	≥1,000 connections explore reclaimed water opportunities	<u>n/a</u>
Chapter 5	Source Water Protection (Check One or Both)	
(√)	Wellhead protection program	<u>45</u>
()	Watershed control program	<u>n/a</u>
Chapter 6	Operation and Maintenance Program	
(√)	Water system management and personnel	<u>46-47</u>
(√)	Operator certification	<u>47</u>
(√)	Routine operating procedures and preventive maintenance	<u>47-48</u>
(√)	Water quality sampling procedures & program – Identify WQ PN Requirements and a limited area water outage/de-pressurization event protocol with a limited health advisory	<u>49</u>
(√)	CMP plan/map. Add RTCR* and Ground Water Rule (GWR) narrative, actions	<u>50</u>
(√)	Emergency program, water shortage plan, service reliability per WAC 246-290-420	<u>50</u>
(√)	Address sanitary survey findings	
(√)	Cross-connection control program – Summarize next actions to address	<u>52-53</u>
(√)	Recordkeeping, reporting, and customer complaint program	<u>54</u>
(√)	Summary of O&M deficiencies	<u>54</u>
Chapter 7	Distribution Facilities Design and Construction Standards	
(?)	Standard construction specification for distribution mains	<u>56</u>
Chapter 8	Improvement Program	
(√)	Capital improvement schedule for the identified planning period (up to 10) and within a 20-year planning period at a minimum	<u>59-63</u>
Chapter 9	Financial Program	
(√)	Balanced budget for the planning period (up to 10) and demonstrating financial viability	<u>68</u>
(√)	Revenue and cash flow stability to fund capital and emergency improvements	<u>68</u>
(√)	Evaluation of affordable rate structure that encourages customer demand efficiency. Budget line item if Water Loss Control Action Plan is required	<u>68-69</u>
Chapter 10	Miscellaneous Documents	
(√)	Meeting of the consumers (documentation). Approval by EGB prior to DOH approval	<u>71</u>
(√)	County/Adjacent Utility Correspondence	<u>71</u>
()	≥1000 connections - State Environmental Policy Act (SEPA) Determination	<u>n/a</u>
(?)	Agreements (intertie, service area, franchise, etc.)	<u>71</u>
(?)	Satellite Management Program	<u>71</u>



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

FEB 10 2020

Scatchet Head Water District
7906 Guemes Ave
Clinton, WA 98236

RE: Water Right No. G1-20574

Dear Sir or Madam:

In response to your request, you are hereby **GRANTED** an extension to put the water to full beneficial use for the reason(s) below:

- Need more time to grow into their water system. Currently, they have 410 connections with the ability to go to 451 connections.
- Chloride and static water levels provisions not followed.

The new deadline to submit your *Proof of Appropriation of Water* is **May 1, 2025**.

Reminder you have provisions on your water right permit. A final certificate will not issue until all provisions are met.

- The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required.
- An approved measuring device shall be installed and maintained for each of the sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", chapter 173-173 WAC.

Water use data shall be recorded monthly. The maximum rate of diversion/withdrawal and the annual total volume shall be submitted to Ecology by January 31st of each calendar year.

The following information shall be included with each submittal of water use data: owner, contact name if different, mailing address, daytime phone number, WRIA, Permit/Certificate/Claim No., source name, annual quantity used including units,



maximum rate of diversion including units, and period of use. In the future, Ecology may require additional parameters to be reported or more frequent reporting. Ecology prefers web based data entry, but does accept hard copies. Ecology will provide forms and electronic data entry information.

Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

- If it can be shown that the requested change has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease withdrawal of water.
- Chloride and conductivity measurements as well as depth to static water level (pump off), measured from the top of the well casing, shall be made on each production well in April & August. The analysis shall be performed by a state accredited laboratory. A copy of the laboratory results for all sampling events shall be submitted by October 15 of each year, to the Department of Ecology, Northwest Regional Office, Bellevue, Washington. For record keeping, please include the water right number on all copies.
- If pumping from the wells authorized by this water causes chloride concentrations to show an increasing trend in any of the wells, immediate action shall be required to prevent pumping concentrations from increasing as in consistent with the water quality anti-degradation policy WAC 173-200-030. If corrective measures fail to prevent chloride concentrations from increasing in the future, permittee or certificate holder shall relinquish the option to perfect additional quantities regardless of the stage of development.
- In order to protect the resource, static water level (SWL) shall be measured at least once each month. Measurements shall be taken after the pump has been shut off a reasonable time to allow water level to return to normal. Ecology's Water Resources section (NWRO) shall be notified if a below normal seasonal drop is measured in SWL, otherwise this data shall be maintained and be made available to Ecology upon request.
- Installation and maintenance of an access port as described in WAC 173-160-291 is required. An air line and gauge may be installed in addition to the access port.
- All water wells constructed (or abandoned) with the State shall meet the minimum

standards for well construction and maintenance as provided under chapter 18.104 RCW, Washington Water Well Construction Act of 1971, and chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

- Issuance of the water right be subject to implementation of the minimum requirements established in the Conservation Planning Requirements, Guidelines and Requirement for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, March 1994, and as revised.

We have modified the following provision:

- Prior to any new construction or alterations of a public water supply system, the State Board of Health rules require public water supply owners to obtain written approval from the Office of Drinking Water of the Washington State Department of Health. Please contact the Office of Drinking Water at Northwest Drinking Water Operations, 20435 72nd Avenue S, Suite 200, K17-12, Kent, WA 98032-2358, (253) 396-6750, prior to beginning (or modifying) your project.

Your Right To Appeal

You have a right to appeal this Order to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal, you must do the following within 30 days of the date of receipt of the Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order to Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel RD SW, Ste 301 Tumwater, WA 98501	Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

For additional information, visit the Environmental Hearings Office Website <http://www.cho.wa.gov>. To find laws and agency rules, visit the Washington State Legislature Website: <http://www1.leg.wa.gov/CodeReviser>.

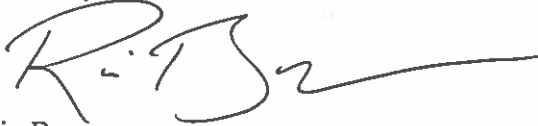
Scatchet Head Water District

G1-20574

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If you have any questions, please contact Michele Curtis at (425) 649-7278 or at michele.curtis@ecy.wa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Berns', with a long horizontal flourish extending to the right.

Ria Berns
Section Manager
Water Resources Program

By Certified Mail: 9171 9690 0935 0214 2443 96

Enclosures: *Proof of Appropriation of Water*
Your Right to be Heard

cc: Sandra Bodamer, King Water Company