Appendix C

Preliminary Water Supply and Wastewater Study

WATER SUPPLY AND WASTEWATER FEASIBILITY STUDY

Quiemuth Village

Address:

Prepared for: Acorn Environmental

5170 Golden Foothill Parkway | El Dorado Hills, CA 95762

Submitted by: Olson Engineering Inc. (A Division of MacKay Sposito)

Designed by: Steve Bacon, PE

Reviewed by: Peter Tuck, PE

June 2, 2023

Job No. A10367

6/2/23

TABLE OF CONTENTS

1.0 Introduction **Page**
1.1 Background 4
1.2 Objectives....8
2.0 Projected Water and Wastewater Flows
2.1 Wastewater Treatment and Water Supply Requirements....10
2.1.1 General....10
2.1.1A Irrigation....10
2.1.1B Cooling Towers/HVAC....10
2.1.2 Peaking Factors....11
2.1.3 Pollutant Loadings....11
2.1.4 Landscaping and Fire Flow Requirements....11
2.1.5 Design Water Demands....12
2.1.6 Design Wastewater Flows....12
2.2 Reclaimed Water Use....13
2.3 Wastewater Effluent....16
2.3.1 Wastewater Effluent Discharged to Surface Water....16
2.3.2 Wastewater Effluent Discharged to Groundwater....18
3.0 Water and Wastewater Strategies
3.1 Water Strategies....19
3.1.1 City of Lacey....22
3.1.1A Cumulative Impacts of Development....23
3.1.2 Development of Onsite Supply Sources....23
3.1.2A Water Availability....24
3.1.2B Water Quality....24
3.1.2C Cumulative Impacts of Development....24
3.1.3 Onsite Water Transmission....25
3.1.4 Reclaimed Water System....25
3.2 Wastewater Strategies....27
3.2.1 City of Lacey....27
3.2.1A Cumulative Impacts of Development....28
3.2.2 Regulatory Requirements....31
3.2.3 Wastewater Collection....31
3.2.4 Wastewater Treatment Options....31
3.2.4A LOTT Clean Water Alliance....31
3.2.4B Onsite Wastewater Treatment Plant....32
3.2.4B(1) Wastewater Effluent Requirements....33
3.2.4B(2) Recommended Treatment Plant....33
3.2.4B(3) Treatment....36
3.2.4B(4) Disposal....37
3.2.4B(5) Treatment Plant Operation....38
3.2.4B(6) Use of Existing Treatment Plant....38

LIST OF DRAWINGS

Figure 1 - Vicinity Map 5
Drawing A1.0 - Quiemuth Village Map Alt-01 6
Drawing B1.0 - Quiemuth Village Map Alt-02 7
Drawing A3.0 - Water/Wastewater Plant Locations Alt-01 20
Drawing B3.0 - Water/Wastewater Plant Locations Alt-02 21
Drawing 3.1 – Conceptual Water Source and Treatment 26
Drawing E1.0 – Existing Utility Locations 29
Drawing E2.0 – Offsite Utility Improvement Locations 30
Drawing 3.2 – Conceptual MBR Wastewater Treatment Plant 34

LIST OF TABLES

Table 1.1A – Proposed Site Uses Alt-01 4
Table 1.1B - Proposed Site Uses Alt-02 8
Table 2.0A – Estimated Water and Wastewater Demand Alt-01 9
Table 2.0B – Estimated Water and Wastewater Demand Alt-02 10
Table 2.1.3 – Estimated Wastewater Characteristics 11
Table 2.1.5A – Recommended Design Water Demands Alt-01 12
Table 2.1.5B – Recommended Design Water Demands Alt-02 12
Table 2.1.6A – Recommended Design Wastewater Demands Alt-01 ... 12
Table 2.1.6B – Recommended Design Wastewater Demands Alt-02 ... 13
Table 2.2A – Possible Reclaimed Water Uses Alt-01 14
Table 2.2A(1) – Water Demand with Reclaimed Water Use Alt-01 15
Table 2.2B – Possible Reclaimed Water Uses Alt-02 15
Table 2.2B(1) – Water Demand with Reclaimed Water Use Alt-02 16
Table 2.2C– Wastewater Reduction with Reclaimed Water Use 16
Table 2.3A – Effluent Discharge Volumes Alt-01 18
Table 2.3B – Effluent Discharge Volumes Alt-02 19
Table 3.1.1 – Cumulative Water Demands 23
Table 3.1.1 – Cumulative Wastewater Production 28

APPENDICES

Appendix A LOTT Clean Water Alliance Reclaimed Water Infiltration Study
Appendix B Hydrogeologic Study

1.0 Introduction

Olson Engineering Inc. (OEI) was retained by Acorn Environmental (AE) to complete a preliminary evaluation of the water and wastewater service requirements for the proposed Quiemuth Village development in Lacey, Washington. The scope includes a review of background site conditions, an evaluation of the adjacent jurisdiction for serviceability, an evaluation of on-site facility requirements and a conceptual design of key water and wastewater facilities as required.

1.1 Background

The Nisqually Indian Tribe owns approximately 248 acres in the City of Lacey. Quiemuth Village will be constructed on approximately 174 acres of that land, which is adjacent to Interstate 5, as shown in Figure 1. The remaining tribal owned property is the subject of a separate proposal for the Quiemuth Casino-Resort development. This report is intended to look at two development alternatives for the Quiemuth Village property: Alternative 1 – the proposed mixed use development and Alternative 2 – a reduced intensity mixed use development. The various uses within each development are listed in Tables 1.1A and 1.1B. Drawings A1.0 & B1.0 show the alternative site plans for the development.

Table 1.1A
Quiemuth Village - Proposed Site Uses Alternative 1

Proposed Use	Gross Area	Proposed Developed Density/Building Area
General Commercial/Retail	40.5 acres	395,000 SF
Big Box Store	-	*185,000 SF*
Large Grocer	-	*100,000 SF*
Retail and Dining	-	*110,000 SF*
Driving Range	7.4 acres	93 stations
Car Dealership	2.0 acres	30,000 SF
Hotel (4-Story)	5.0 acres	200 rooms
Family Entertainment	19.5 acres	179,000 SF
Theater and Dining	-	*45,000 SF*
Bowling and Bowling Social	-	*40,000 SF*
Family Entertainment Center	-	*27,000 SF*
Food, Beverage and Retail	-	*47,000 SF*
Brewery	-	*20,000 SF*
High Density Multi-Family Apartments	14.6 acres	300 units
Cultural Village - Live-Work	8.2 acres	110,000 SF; 20 units
Grocery	4.8 acres	30,000 SF
Neighborhood Retail	17.2 acres	149,500 SF
Truck Stop	28.0 acres	36,000 SF

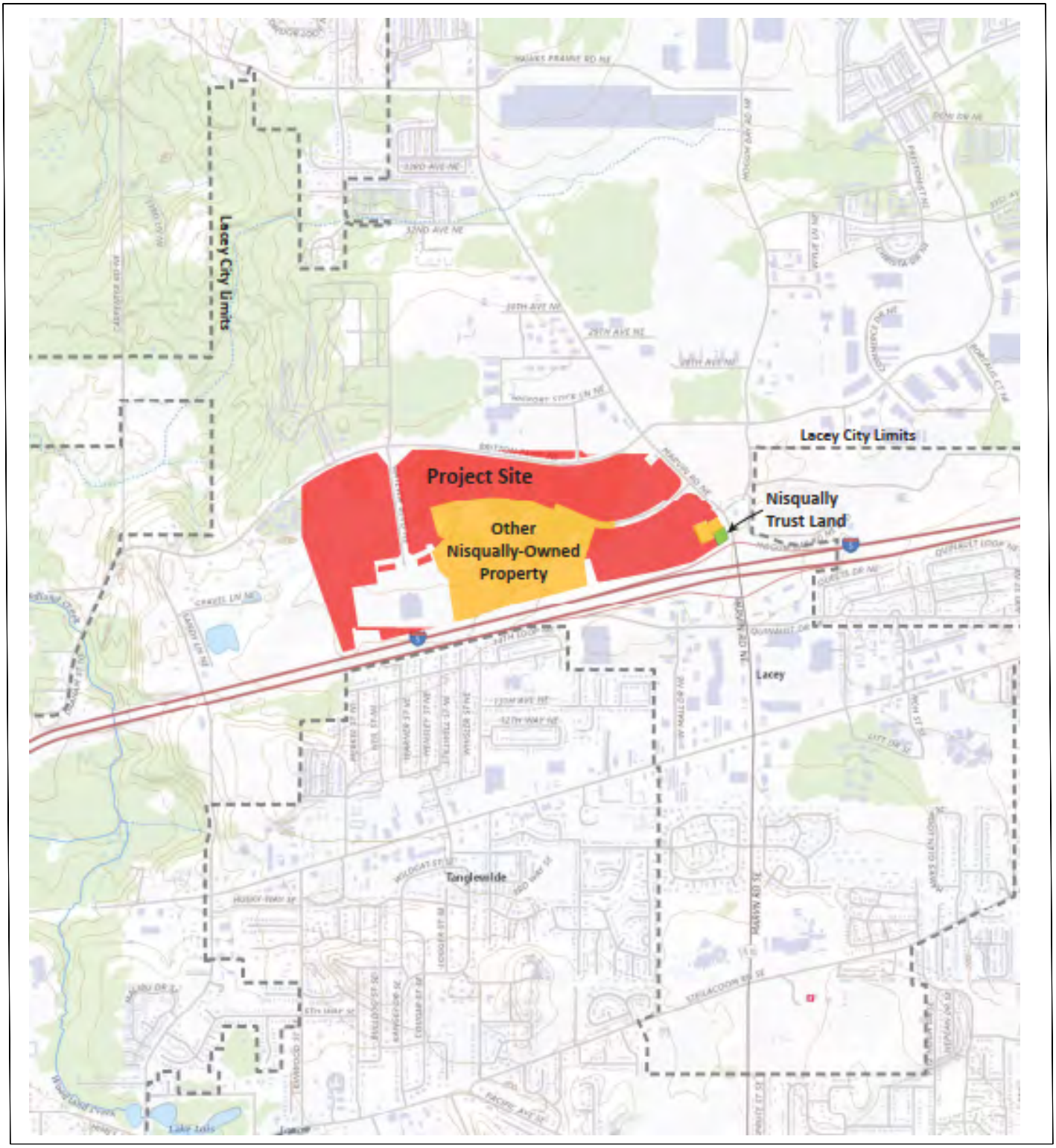


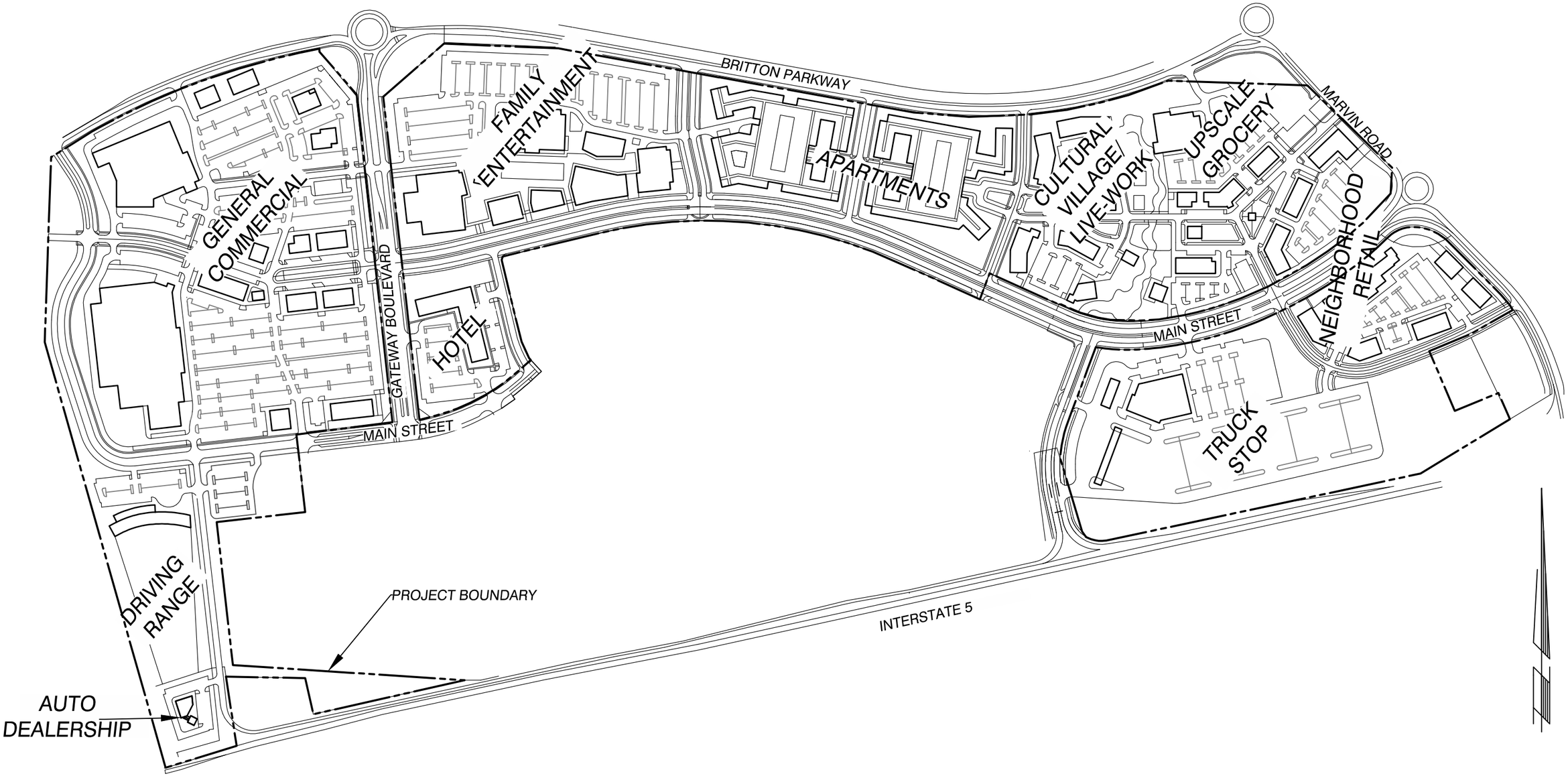
FIGURE 1
VICINITY MAP

SCALE: NTS
DATE: 07/28/2022
ISSUED BY: SGB

OLSON ENGINEERING INC.
LAND SURVEYORS
ENGINEERS
360-695-1385
503-289-9936
222 E. EVERGREEN BLVD, VANCOUVER, WA 98660

PROJECT: QUIEMUTH VILLAGE

JOB NO. A10367.01.01
DWG. NO. 1 OF 1



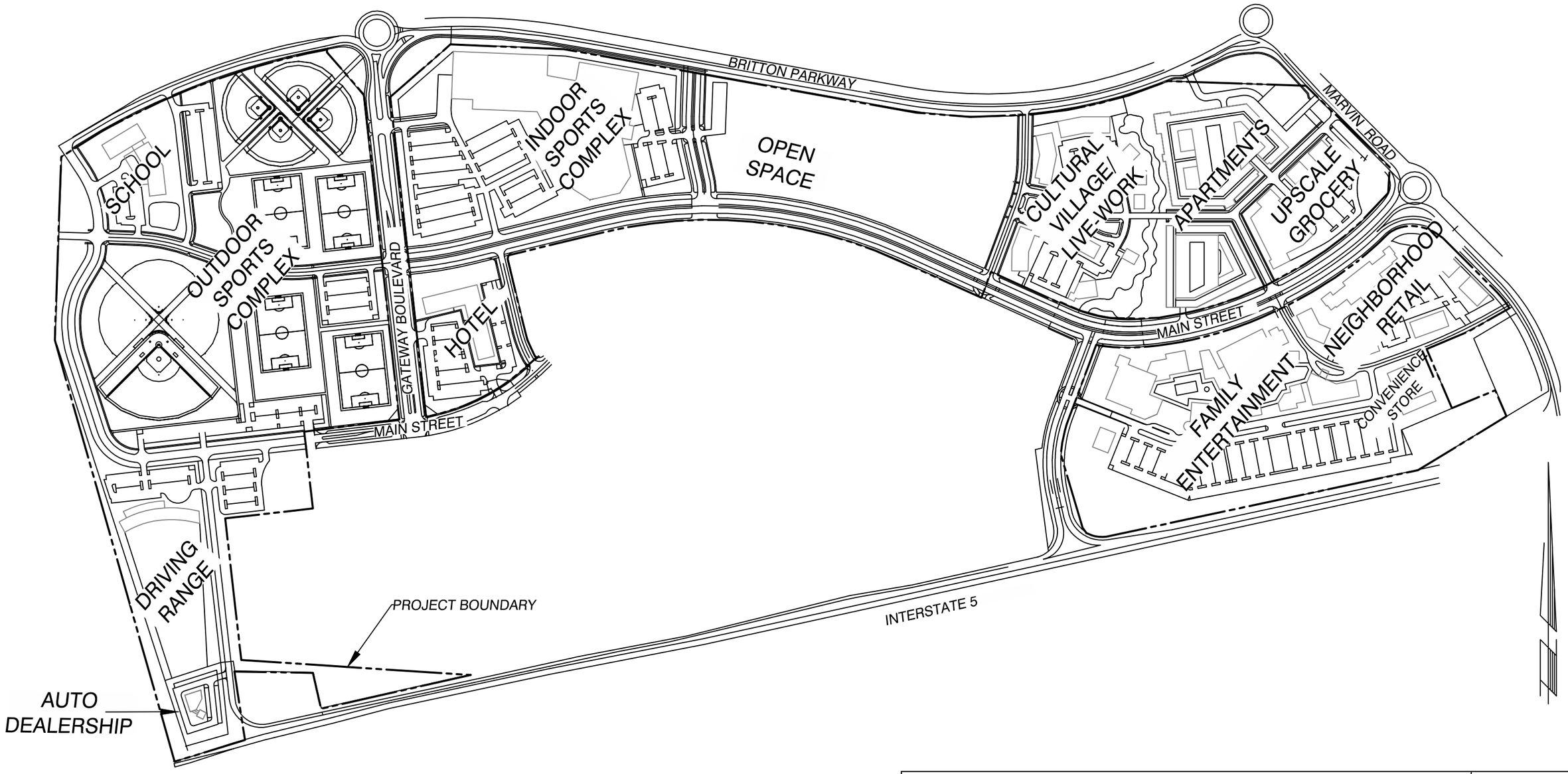
ALTERNATIVE 1
PROPOSED MIXED USE PROJECT

OLSON ENGINEERING INC. LAND SURVEYORS ENGINEERS 360-695-1385 222 EVERGREEN, VANCOUVER, WA 98660

PROJECT: QUIEMUTH VILLAGE

SCALE: NTS
DATE: 07/29/2022
ISSUED BY: SGB
JOB NO. A10367.01.01
DWG. NO. A1.0

FILE NAME: Z:\A10000\A10300\A10360\A10367\Sewer-Water\ALT 1 08282022.dwg



FILE NAME: Z:\A10000\A10300\A10360\A10367\Sewer-Water\ALT 2 07292022.dwg

ALTERNATIVE 2
REDUCED INTENSITY MIXED USE PROJECT

SCALE: NTS
DATE: 07/29/2022
ISSUED BY: SGB

OLSON ENGINEERING INC. LAND SURVEYORS ENGINEERS 360-695-1385 222 EVERGREEN, VANCOUVER, WA 98660

PROJECT: QUIEMUTH VILLAGE

JOB NO. A10367.01.01

DWG. NO. B1.0

Table 1.1B
Quiemuth Village - Proposed Site Uses Alternative 2

Proposed Use	Gross Area	Proposed Developed Density/Building Area
School	4.0 acres	30,000 sf
Outdoor Athletic Complex	26.5 acres	12 fields
Driving Range	7.4 acres	93 stations
Car Dealership	2.0 acres	10,000 sf
Indoor Recreation	19.5 acres	200,000 sf
Hotel (4-Story)	5.0 acres	200 rooms
Cultural Village - Live-Work	8.2 acres	110,000 sf; 20 units
High Density Multi-Family Apartments	7.4 acres	300 units
Grocery Anchored Retail	5.08 acres	40,000 sf
Grocery	-	*30,000 sf*
Pad Sites	-	*10,000 sf*
Family Entertainment	20.0 acres	159,000 sf
Theater and Dining	-	*54,000 sf*
Bowling and Bowling Social	-	*37,000 sf*
Family Entertainment Center	-	*16,000 sf*
Retail and Dining	-	*52,000 sf*
Neighborhood Retail	7.7 acres	59,500 sf
Convenience Store/Gas Station	8.0 acres	10,000 sf;
Undeveloped/Passive Park	14.6 acres	14.6 acres

1.2 Objectives

The goal of this study is to identify and evaluate the water supply and wastewater disposal needs and options for Quiemuth Village on a conceptual level. Specific objectives of the study are to:

- Estimate domestic water demand and on-site storage requirements for each alternative.
- Estimate wastewater flows for each alternative.
- Research the ability of adjacent jurisdictions to provide water and sanitary service to the site.
- Research the ability to supply water through onsite wellhead and distribution facilities.
- Research and develop a strategy for onsite wastewater treatment and disposal, including reuse of wastewater effluent.

2.0 Projected Water and Wastewater Flows

This section presents estimates of projected water demands and wastewater flows for the project. Tables 2.0A and 2.0B present a summary of the components of the proposed project for each alternative.

Demand Per Unit (gpd) factors for the proposed uses were based on estimates from sources including the US Environmental Protection Agency's (US EPA) Onsite Wastewater

Treatment System Manual (2002), the US Energy Information Administration's 2012 Commercial Buildings Energy Consumption Survey, and Seattle Public Utilities' Hotel Water Conservation Demonstration (2002). Within the estimates retail establishments are categorized by two factors, a general component for employee and housekeeping flows and a parking factor to estimate customer generated flows. General commercial uses are assumed to have approximately 7.7% of the gross floor area dedicated to restaurant uses based on an analysis of commercial holdings of two national real estate investment trust companies. Entertainment uses (theater, family entertainment center, driving range and bowling alley) were assumed to have a portion of the building dedicated to restaurant use. Assumptions were made based on analysis of information available from similar national and regional establishments within similar business categories. Driving range square footage (55,500 square feet, plus 9,500 square feet of restaurant space) is based on a comparably sized facility in Hillsboro Oregon.

Wastewater and Water Flow Estimates

Table 2.0A
Quiemuth Village - Estimated Water and Wastewater Demand - Alternative 1

Facility/Use	Units	Demand per Unit (gpd)	Quantity	Water Usage (gpd)	Sanitary Sewer Production (gpd)
Apartments	Apt	150	300	45,000	45,000
Theater	SF	0.12	41,200	4,944	4,944
Entertainment Center	SF	0.08	17,500	1,400	1,400
Retail	SF	0.011	541,740	5,959	5,959
Grocery	SF	0.022	130,000	2,860	2,860
Retail Parking Factor	Spot	2	3,430	6,860	6,860
Office	SF	0.021	30,000	630	630
Hotel	Room	73	200	14,600	14,600
Driving Range	SF	0.08	55,500	4,440	4,440
Car Dealership	SF	0.011	30,000	330	330
Truck Stop	SF	0.016	31,000	496	496
Restaurants	SF	1	87,060	87,060	87,060
Bowling Alley	SF	0.16	30,500	4,880	4,880
Live/Work Units	EA	200	20	4,000	4,000
HVAC/Cooling	Ton	30/15	1,989	59,670	29,835
Landscape Irrigation	Acre	4,000/0	30	120,000	0
Totals =				363,129	213,294

Table 2.0B
Quiemuth Village - Estimated Water and Wastewater Demand – Alternative 2

Facility/Use	Units	Demand per Unit (gpd)	Quantity	Water Usage (gpd)	Sanitary Sewer Production (gpd)
Apartments	Apt	150	300	45,000	45,000
Theater	SF	0.12	50,200	6,024	6,024
Entertainment Center	SF	0.08	10,375	830	830
Retail	SF	0.011	138,000	1,518	1,518
Grocery	SF	0.022	30,000	660	660
Retail Parking Factor	Spot	2	1,000	2,000	2,000
Office	SF	0.021	30,000	630	630
Hotel	Room	73	200	14,600	14,600
Driving Range	SF	0.08	55,500	4,440	4,440
Car Dealership	SF	0.011	10,000	110	110
Convenience Store	SF	0.16	10,000	1,600	1,600
Restaurants	SF	1	85,425	85,425	85,425
Athletic Complex	Restroom Stall	250	24	6,000	6,000
Indoor Recreation	SF	0.1	200,000	20,000	20,000
School	SF	0.75	30,000	22,500	22,500
Bowling Alley	SF	0.16	29,500	4,720	4,720
Live/Work Units	EA	200	20	4,000	4,000
HVAC/Cooling	Ton	30/15	1,787	53,610	26,805
Landscape Irrigation	Acre	4,000/0	55	220,000	0
Totals =				493,667	246,862

2.1 Wastewater Treatment and Water Supply Requirements.

2.1.1 General

Generally, water supply to the development is roughly equivalent to its wastewater flows. There are, however, some notable exceptions to this rule:

2.1.1A Irrigation

Water used for irrigation is not returned to the sanitary system but is, instead, lost to infiltration and evapotranspiration. For the purposes of this study, it was assumed that landscape irrigation water would be supplied from the water source. A water demand of 4,000 gallons per acre per day has been assumed for landscape irrigation for both alternatives. Reclaimed water may be used for irrigation, which would lower the overall potable water demand. Reclaimed water could be supplied by the on-site treatment plant, or from the City of Lacey.

2.1.1B Cooling Towers/HVAC

Commercial cooling systems require significant water loading, however, a significant portion of this is lost to the atmosphere in the cooling process. The overall water use and discharge

to sanitary was estimated based on standards and studies published by the American Society of Heating, Refrigerating and Air Conditioning Engineers (2020), the Air Conditioning Contractors of America (2020), and the University of Arizona (1994).

Generally, only large commercial structures and restaurant uses will utilize evaporative coolers, so the estimates do not reflect the total building square footage of the project.

2.1.2 Peaking Factors

In sizing wastewater conveyance and treatment facilities and determining water source requirements, peak daily and hourly flows are needed. To determine these flows, peaking factors are applied. It should be noted that peak wastewater and water flows for commercial facilities differ significantly from textbook peaking factors for domestic flows from residential communities. Using the City of Lacey's overall ratio between Average Daily Demand and Maximum Daily Demand from their water system plan and the Washington Department of Ecology Water System Design Manual peaking factor for peak hour flow, the following peaking factors were established:

Peak Day Flow = 2.03 x Average Daily flow
Peak Hour Flow = 3.5 x Average Hourly flow

2.1.3 Pollutant Loadings

The other factors to be taken into account when designing wastewater treatment are the biochemical oxygen demand (BOD) and grease loading.

For planning and preliminary design purposes, the raw wastewater quality assumed for conventional pollutants in this study is summarized in Table 2.1.3.

Table 2.1.3
Quiemuth Village - Estimated Wastewater Characteristics

	Parameter	Concentration (mg/L)
	Biochemical Oxygen Demand (BOD)	162*
	Total Suspended Solids (TSS)	165*
	Total Kjeldahl Nitrate (TKN)	45

*Based on current LOTT average for the City of Lacey from the city's General Sewer Plan.

2.1.4 Landscape and Fire Flow Requirements

Landscaping requirements are assumed to be approximately 4,000 gpd per acre of irrigated landscaping during peak irrigation months. The source for this flow will be addressed later in the report.

Fire Flow – Distribution systems need to have sufficient reserve capacity to supply water for fire suppression. Requirements for the project, based on City of Lacey code section 14.07, are 4,000 gpm for 4 hours at a residual pressure of 20 psi. This assumes all buildings are fully sprinklered.

2.1.5 Design Water Demands

Based on the projected flows developed in Section 2.0 and applying the necessary peaking factors, the design water demands are as shown in Tables 2.1.5A and 2.1.5B.

Table 2.1.5A
Quiemuth Village - Recommended Design Water Demands (gpm)- Alternate 1

	Flow Condition	(gpd)	(gpm)
	Average Day Demand	363,129	252
	Max Day Demand	737,152	511
	Peak Hour Demand	--	883
	Fire Flow	--	4,000

Maximum day peaking factor 2.03, peak hour peaking factor of 3.5 applied.

Table 2.1.5B
Quiemuth Village - Recommended Design Water Demands (gpm)- Alternate 2

	Flow Condition	(gpd)	(gpm)
	Average Day Demand	493,667	343
	Max Day Demand	1,002,144	696
	Peak Hour Demand	--	1,200
	Fire Flow	--	4,000

Maximum day peaking factor 2.03, peak hour peaking factor of 3.5 applied.

2.1.6 Design Wastewater Flows

Based on the projected flows developed in Section 2.0 and applying the necessary peaking factors, the design wastewater flows are as shown in Tables 2.1.6A and 2.1.6B.*Table 2.1.6A*

Quiemuth Village - Recommended Design Wastewater Demands (gpm)- Alternate 1

	Flow Condition	(gpd)	(gpm)
	Average Day Wastewater Flow	213,294	148
	Peak Day Wastewater flow	432,987	301
	Peak Hourly Wastewater Flow	--	518

Maximum day peaking factor 2.03, peak hour peaking factor of 3.5 applied.

Table 2.1.6B
Quiemuth Village - Recommended Design Wastewater Demands (gpm)- Alternate 2

	Flow Condition	(gpd)	(gpm)
	Average Day Wastewater Flow	246,862	171
	Peak Day Wastewater flow	501,130	348
	Peak Hourly Wastewater Flow	--	600

Maximum day peaking factor 2.03, peak hour peaking factor of 3.5 applied.

2.2 Reclaimed Water Use

The use of reclaimed water on federal trust land is regulated by the US EPA.

The US EPA has historically permitted water reclamation plants with standards based on the limits set by the state in which the plant is located. The US EPA does not currently have regulations for reclaimed water standards; but has generally recognized Washington State's limits as an approved program for use.

The use of reclaimed water on non-federal lands in Washington State is regulated under the Water Reclamation and Reuse Standards as published by Washington State Department of Health and Washington State Department of Ecology in September 1997.

A new wastewater treatment plant would treat wastewater to a level consistent with Washington State Department of Ecology standards.

The use of reclaimed water would significantly reduce potable water demands and wastewater disposal requirements. Potential uses for reclaimed water proposed for the Quiemuth Village project include:

- Toilet flushing
- Landscape irrigation
- Emergency fire flow and fire sprinkler

By maximizing the use of reclaimed water, the average potable water demands can be reduced by as much as 49.9%. Tables 2.2A and 2.2B represent the potential for reclaimed water use for the two alternatives. The additional expense and complexity of plumbing the buildings for both reclaimed and potable water will likely reduce the likelihood of reclaimed water being used for toilet flushing and fire sprinkler systems, which would leave landscape irrigation as the only ongoing use for reclaimed water. The water reuse is examined both with and without the internal use within the buildings.

By maximizing reclaimed water use, wastewater disposal requirements could also be reduced significantly. Table 2.2A(1) and 2.2B(1) provide estimated domestic water usages depending on the amount of reclaimed water use. For example: from Table 2.0A 213,294 gallons of wastewater would be produced a day. Approximately 1,800 gallons of that would be sludge so 211,494 gallons would be available for reuse. (213,294 gpd x 165 ppm TSS creates approximately 35 gallons of solids. At approximately 98% moisture content, primary sludge

volumes would be 1,760 gallons. This is rounded up to the nearest 100 gallons for this estimate due to variation in sludge moisture content.) Table 2.2A shows possible reclaimed water usage of 136,379 gallons if reclaimed water is used to the maximum extent possible. Effluent discharge from the treatment plant under this scenario would be 75,115 gpd, representing a 64.5% decrease in effluent quantities. Table 2.2C shows the possible effluent reductions for each of the alternatives. Wastewater effluent from the treatment plant could be eliminated, or virtually eliminated under Alternate 2.

In the following tables, it is assumed that food service uses will avoid reclaimed water entirely as a safety measure to remove the possibility of inadvertent cross connection. It is possible to utilize reclaimed water for toilet flush in food service areas; however, the water intensive nature of the food service uses makes both the possibility and the public health risk of cross connection greater.

Table 2.2A
Quiemuth Village – Possible Reclaimed Water Uses - Alternative 1

Facility	Average Daily Water Usage (gal)	Approximate Percentage Water Usage Available for Supply from Reclaimed Water %	Reclaimed Water Usage Possible (gal)
Apartments	45,000	10%	4,500
Theater	4,944	25%	1,236
Entertainment Center	1,400	25%	350
Retail	5,959	25%	1,490
Grocery	2,860	12%	343
Retail Parking Factor	6,860	25%	1,715
Office	630	25%	158
Hotel	14,600	25%	3,650
Driving Range	4,440	25%	1,110
Car Dealership	330	25%	83
Truck Stop	496	25%	124
Restaurants	87,060	0	0
Bowling Alley	4,880	25%	1,220
Condo	4,000	10%	400
Cooling	59,670	0	0
Landscape Irrigation	120,000	100%	120,000
Totals			136,379

Table 2.2A(1)
Quiemuth Village – Water Demand with Reclaimed Water Use - Alternative 1

Facility	Average Daily Water Usage w/no recycling (gal)	Average Daily Water Usage w/maximum recycling of effluent (gal)	Average Daily Water Usage w/ recycling for landscape irrigation only (gal)
Apartments	45,000	40,500	45,000
Theater	4,944	3,708	4,944
Entertainment Center	1,400	1,050	1,400
Retail	5,959	4,469	5,769
Grocery	2,860	2,517	2,860
Retail Parking Factor	6,860	5,145	6,860
Office	630	472	630
Hotel	14,600	10,950	14,600
Driving Range	4,440	3,330	4,440
Car Dealership	330	247	330
Truck Stop	496	372	496
Restaurants	87,060	87,060	87,060
Bowling Alley	4,880	3,660	4,880
Live/Work Unit	4,000	3,600	4,000
HVAC/Cooling	59,670	59,670	59,670
Landscape Irrigation	120,000	0	0
Totals	363,129	226,750	243,129
Water Use Reduction		37.6%	33.0%

Table 2.2B
Quiemuth Village – Possible Reclaimed Water Uses - Alternative 2

Facility	Average Daily Water Usage (gal)	Approximate Percentage Water Usage Available for Supply from Reclaimed Water %	Reclaimed Water Usage Possible (gal)
Apartments	45,000	10%	4,500
Theater	6,024	25%	1,506
Entertainment Center	830	25%	207
Retail	1,518	25%	379
Grocery	660	12%	79
Retail Parking Factor	2,000	25%	500
Office	630	25%	157
Hotel	14,600	25%	3,650
Driving Range	4,440	25%	1,110
Car Dealership	110	25%	27
Convenience Store	1,600	25%	400
Restaurants	85,425	0	0
Athletic Complex	6,000	25%	1,500
Indoor Recreation	20,000	25%	5,000
School	22,500	25%	5,625
Bowling Alley	4,720	25%	1,180
Condo	4,000	10%	400
Cooling	53,610	0	0
Landscape Irrigation	220,000	100%	220,000
Totals	493,667		246,220

Table 2.2B(1)
Quiemuth Village – Water Demand with Reclaimed Water Use – Alternative 2

Facility	Average Daily Water Usage w/no recycling (gal)	Average Daily Water Usage w/maximum recycling of effluent (gal)	Average Daily Water Usage w/ recycling for landscape irrigation only (gal)
Apartments	45,000	40,500	45,000
Theater	6,024	4,518	6,024
Entertainment Center	830	623	830
Retail	1,518	1,139	1,518
Grocery	660	581	660
Retail Parking Factor	2,000	1,500	2,000
Office	630	473	630
Hotel	14,600	10,950	14,600
Driving Range	4,440	3,330	4,440
Car Dealership	110	83	110
Convenience Store	1,600	1,200	1,600
Restaurants	85,425	85,425	85,425
Athletic Complex	6,000	4,500	6,000
Indoor Recreation	20,000	15,000	20,000
School	22,500	16,875	22,500
Bowling Alley	4,720	3,540	4,720
Condo	4,000	3,600	4,000
Cooling	53,610	53,610	53,610
Landscape Irrigation	220,000	0	0
Totals	493,667	247,447	273,667
Water Use Reduction		49.9%	44.6%

Table 2.2C
Quiemuth Village - Wastewater Reduction with Reclaimed Water Use

Alternative	Average Daily Wastewater Flow (gpd)	Wastewater Effluent w/Maximum Reclaimed Water Use (gpd)	Percent Reduction	Wastewater Effluent w/Landscape Only Reclaimed Water Use (gpd)	Percent Reduction
Alternative 1	213,294	75,115	64.5%	91,494	56.7%
Alternative 2	246,862	(1,410)	100%	24,812	89.9%

2.3 Wastewater Effluent

After wastewater is processed by a wastewater treatment plant, the effluent must be disposed of in an appropriate manner. Several options were reviewed for the discharge of treated effluent and are outlined below.

2.3.1 Wastewater Effluent Discharged to Surface Water

Wastewater effluent that is not reclaimed or sent to the sludge basin would need to be discharged to a receiving stream or other water body. As no water bodies exist on the site, the discharge would need to be to a water body outside of the land proposed to be taken into trust. This creates logistical and jurisdictional issues. The nearest creek is Woodland Creek, access to which is approximately 3,500 feet west of the site along I-5. Woodland Creek is

identified in Section 303(d) listings as exceeding TMDL's for temperature, coliform bacteria, pH, and dissolved oxygen. In order to discharge to Woodland Creek, effluent quality would need to meet or exceed the Washington State Department of Ecology's Class A standards and temperature would need to be controlled. This, along with a lack of direct access to the creek on property controlled by the tribe, makes this option impractical; therefore it was removed from consideration.

It would be possible to create a new wetland on the site similar to the LOTT Alliance's Hawks Prairie reclaimed water ponds. That facility is situated on 41 acres of land approximately 2,800 feet north of the site on Hogum Bay Road NE. The site accepts reclaimed water into a series of man-made ponds where the water continues to be treated by biological processes that reduce the concentrations of a number of contaminants that remain in the effluent leaving the treatment plant as well as residual chlorine from disinfection. After the reclaimed water has flowed through the series of ponds, it flows into one or more of the eight rapid infiltration basins on the site. These act similarly to the drainfield in a typical septic system, allowing the water to percolate into the soil below. The LOTT Alliance's Hawks Prairie site is sized to accept up to 2 MGD of reclaimed water. If a similar discharge method is used at the Quiemuth Village Site, in order to accept all of the wastewater effluent from the project, the reclaimed water pond facility would need to be approximately 8 acres. This area would consist of approximately 7.6 acres dedicated to a series of ponds and an infiltration area of approximately 0.4 acres based on the preliminary hydrological study of the area (see Appendix B). The ponds can be designed as water features within the project or as standalone ponds. The infiltration basins can be placed under a parking lot to avoid potential impacts to landscaping or other uses. It would be desirable to locate the ponds and infiltration beds away from the location of any wells on the site. To utilize this method of disposal, the treatment plant would need to provide tertiary treatment to produce effluent meeting reuse standards as required by the US EPA.

Both Perfluoropentanoic acid (PFPeA) and N-Nitrosodimethylamine (NDMA) have been found to be leaching into the aquifer from the Hawks Prairie ponds based on the Reclaimed Water Infiltration Study commissioned by LOTT (see Appendix A). These chemicals have been found intermittently in low concentrations; however, both have been linked to the effluent discharged by the ponds. PFPeA is present in a number of consumer products from preserved food items to fire resistant coatings and firefighting foams. NDMA is more commonly found in rubberized coatings; but can also be found in certain cosmetics and pesticides. Both of these chemicals are considered to be persistent in the environment and similar chemicals have been associated with an increased risk of cancer in laboratory testing. While there are no current regulatory limits on either of these chemicals, the US EPA is actively working on research and rules regarding Perfluoroalkyl substances in general.

A multi-year Reclaimed Water Infiltration Study was completed by the LOTT Alliance in August of 2022 to determine what, if any, steps should be taken to reduce the concentrations of these chemicals in the wastewater effluent feeding the Hawks Prairie ponds. The results of the study indicate that the addition of a granular activated carbon (GAC) filter will be effective in removing the PFPeA from the effluent stream. The GAC filter would also prevent the formation of NDMA during the disinfection stage of the treatment process. To

reduce NDMA that exists prior to disinfection, the addition of Biological Activated Carbon and Ozone processes would be necessary.

2.3.2 Wastewater Effluent Discharged to Groundwater

As an alternate to surface water discharge, effluent may be discharged to groundwater. This is accomplished by injecting the effluent into the ground via one or more Class V injection wells. The wells are relatively shallow and inject the effluent above the aquifer allowing the soils to filter the effluent prior to it entering the drinking water source. This technology has been used with success in a number of locations within the state of Washington. The approval of this type of system is regulated by the US EPA under its Underground Injection Control program. To utilize this method of disposal, the treatment plant would need to provide tertiary treatment to produce effluent that meets the US EPA's reuse standards.

The third column of Table 2.3A shows a peak day wastewater discharge with no reclaimed water use of 476,571 gallons (472,171 gpd after sludge removal). If the plant that treats the wastewater does not have equalization storage built-in this could be the flows discharged to surface waters or subsurface wells. If the tribe builds a Wastewater Treatment Plant on-site it would be built with equalization capacity ahead of the treatment train. This means that regardless of flows coming into the plant, the maximum effluent discharge would be the average day discharge shown in the second column. With an onsite wastewater treatment plant, the maximum discharged to surface waters would be approximately 234,764 gallons a day (232,564 gpd after sludge removal) or 162 gpm assuming no reclaimed water is used. Similar information is shown in Table 2.3B for alternative 2.

Table 2.3A
Quiemuth Village – Effluent Discharge Volumes – Alternative 1

Facility	Ave. Day WW Discharge w/no recycling (gal)	Peak Day WW Discharge w/no recycling (gal)	Ave. Day WW Discharge w/ recycling (gal)	Peak Day. WW Discharge w/ recycling (gal)
Apartments	45,000	91,350	40,500	82,215
Theater	4,944	10,036	3,708	7,527
Entertainment Center	1,400	2,842	1,050	2,132
Retail	5,959	12,097	4,469	9,072
Grocery	2,860	5,806	2,517	5,110
Retail Parking Factor	6,860	13,926	5,145	10,444
Office	630	1,279	472	958
Hotel	14,600	29,638	10,950	22,229
Driving Range	4,440	9,013	3,330	6,760
Car Dealership	330	670	247	501
Truck Stop	496	1,007	372	755
Restaurants	87,060	176,732	87,060	176,732
Bowling Alley	4,880	9,906	3,660	7,430
Live/Work Units	4,000	8,120	3,600	7,308
HVAC/Cooling	29,835	60,565	29,385	60,565
Landscape Irrigation	0	0	(120,000)	(120,000)
Totals	213,294	432,987	76,915	279,737
Sludge Volume Retained	1,800	3,650	1,800	3,650
Net Discharge Volume	211,494	429,337	75,115	276,087

Table 2.3B
Quiemuth Village – Effluent Discharge Volumes – Alternative 2

Facility	Ave. Day WW Discharge w/no recycling (gal)	Peak Day WW Discharge w/no recycling (gal)	Ave. Day WW Discharge w/ recycling (gal)	Peak Day. WW Discharge w/ recycling (gal)
Apartments	45,000	91,350	40,500	82,215
Theater	6,024	12,229	4,518	9,172
Entertainment Center	830	1,685	623	1,264
Retail	1,518	3,082	1,139	2,311
Grocery	660	1,340	581	1,179
Retail Parking Factor	2,000	4,060	1,500	3,045
Office	630	1,279	473	959
Hotel	14,600	29,638	10,950	22,229
Driving Range	4,440	9,013	3,330	6,760
Car Dealership	110	223	83	167
Convenience Store	1,600	3,248	1,200	2,436
Restaurants	85,425	173,413	85,425	173,413
Athletic Complex	6,000	12,180	4,500	9,135
Indoor Recreation	20,000	40,600	15,000	30,450
School	22,500	45,675	16,875	34,256
Bowling Alley	4,720	9,582	3,540	7,186
Live/Work Units	4,000	8,120	3,600	7,308
HVAC/Cooling	26,805	54,414	26,805	54,414
Landscape Irrigation	0	0	(220,000)	(220,000)
Totals	246,862	501,130	640	227,899
Sludge Volume Retained	2,050	4,160	2,050	4,160
Net Discharge Volume	244,812	496,970	(1,410)	223,739

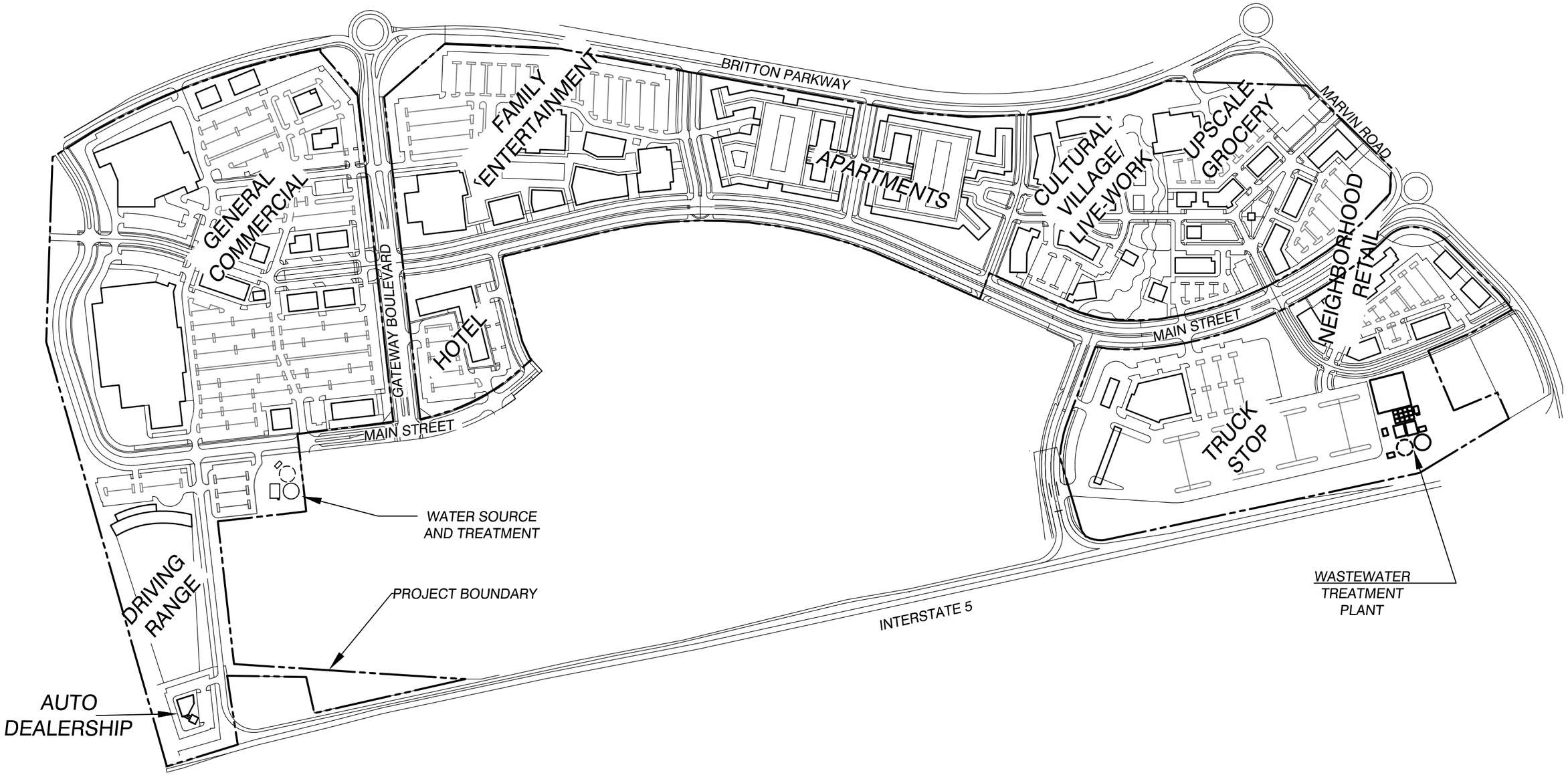
3.0 Water and Wastewater Strategies

This section addresses the options available to provide both water and wastewater service to the site. Drawings A3.0 and B3.0 show the possible locations for onsite water supply and wastewater treatment facilities for the two alternatives.

3.1 Water Strategies

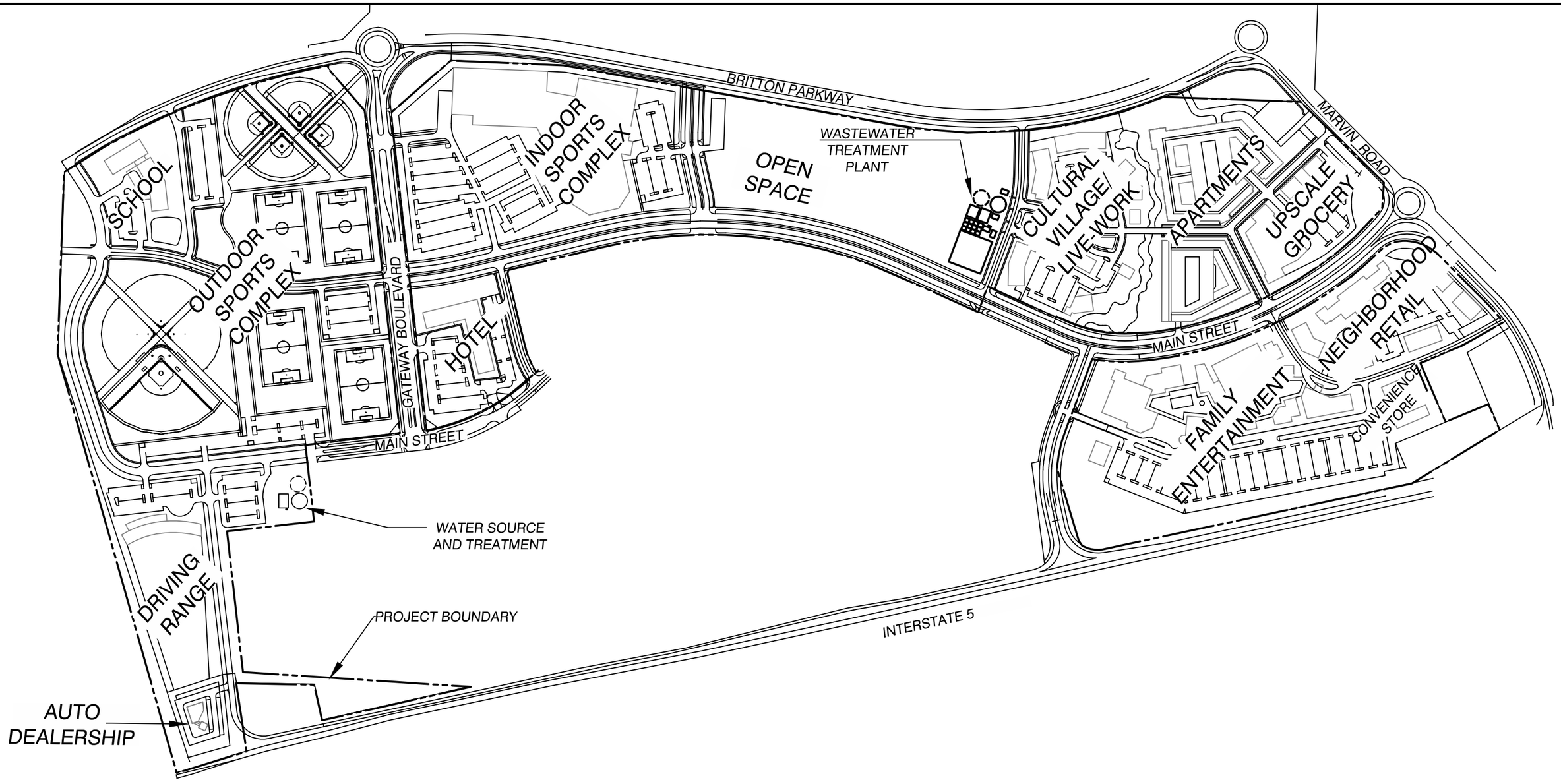
The site is located within the service area of the City of Lacey. No other public water purveyors are in the area.

In addition to municipal supplies, an option also exists to develop on-site supply sources.



ALTERNATIVE 1 WATER/WASTEWATER PLANT LOCATIONS		SCALE: NTS DATE: 08/01/2022 ISSUED BY: SGB
OLSON ENGINEERING INC. LAND SURVEYORS ENGINEERS 360-695-1385 222 EVERGREEN, VANCOUVER, WA 98660	PROJECT: QUIEMUTH VILLAGE	JOB NO. A10367.01.01 DWG. NO. A3.0

FILE NAME: Z:\A10000\A10300\A10360\A10367\Sewer-Water\ALT 1 08282022.dwg



FILE NAME: Z:\A10000\A10300\A10360\A10367\Sewer-Water\ALT 2 07292022.dwg

ALTERNATIVE 2
WATER/WASTEWATER
PLANT LOCATIONS

SCALE: NTS
DATE: 08/01/2022
ISSUED BY: SGB

OLSON ENGINEERING INC. LAND SURVEYORS ENGINEERS 360-695-1385 222 EVERGREEN, VANCOUVER, WA 98660

PROJECT: QUIEMUTH VILLAGE

JOB NO. A10367.01.01
DWG. NO. B3.0

3.1.1 City of Lacey

The City of Lacey supplies water to a population of approximately 75,000, which equates to approximately 25% of the Thurston County population. Based on the city's water system plan update, dated April 2022, the city's source of supply consists of 20 groundwater wells located throughout the service area and drawing from three distinct aquifers. The peak reliable pumping capacity of the well system during maximum demand days is approximately 28 MGD or 19,500 gpm. Undeveloped water rights currently held by the City would allow a total withdrawal of 23,500 gpm or 34 MGD.

In addition to the wells, the city's water system plan indicates that the system contains a total of 7 water storage reservoirs with a total storage capacity of 13.0 MG. An additional 2 MG is under currently construction and another 1.25 MG is in design.

Based on discussions with from June to October of 2022 Brandon McAllister, the City of Lacey's Utility Engineer, the City of Lacey has both supply and pressure capabilities to serve the site with up to 350,000 gallons of water per day. This is enough to supply all water needs for the Quiemuth Village project with the exception of peak day demands. The city has two well construction projects (Well S04 Supplemental well & Marvin Road Well) underway that will eliminate that restriction and allow the City to supply the full project demands. Those projects are currently anticipated to be completed in 2026.

Upon review of the preliminary project scope, the city also indicated in their September 14, 2022 review comments that a 16" water line will need to be constructed across Interstate 5 from the Wal-Mart to the south of the site (see Drawing E 1.0 for the location of the existing water line). This line extension is shown in the City's water system plan as project number P-29 and is described as a redundant crossing of I-5. While it does not appear to be necessary to provide the necessary volume of water to the project site, it provides the city with additional system resiliency to ensure reliable service in the event of failures in other parts of the system.

The Quiemuth Village property has multiple water lines either on the site or immediately adjacent to it. There are 16" water lines in Gateway Boulevard NE, Britton Parkway NE, and Main Street NE on the western portion of the site. These lines have 12" lateral stubs extended out of the existing roadways to the property. There is also a 12" line in Western Parkway NE in the northwest corner of the site.

There are 14" water lines in Main Street NE on the eastern portion of the site. There are lateral stubs to the north and south out of the existing roadway, however their size is unknown. Other facilities available on the eastern portion of the site include 14" water lines in Marvin Road NE. There are no known lateral stubs accessing these lines.

Based on the City of Lacey's Water System Plan, assuming connections exist to any of the mains, the following flows to the site can be provided (assuming the completion of at least one of the City's current supply projects):

- Water Service – 696 gpm at 70 - 75 psi.
- Fire Service – 4,500 gpm at 20 psi where 500 gpm will be for water service and 4,000 gpm for fire flow.

As the maximum daily water demand for Alternative 2 is 1,002,144 gpd, onsite storage is needed to provide this quantity of water until the City's supply projects are completed.

The required onsite fire flow is 4,000 gpm for 4 hours, onsite storage is required to provide this flow until the City's supply projects are completed. The storage volume needed for fire flow would eliminate the need for the separate operational storage mentioned above.

The City of Lacey water system is made up of multiple pressure zones. The pressure zone that the project site would connect to is North and East Lacey zone (zone 400) with a hydraulic grade line of 400'.

3.1.1A Cumulative Impacts of Development

Upon completion of both the Quiemuth Village project and the Quiemuth Casino-Resort project, the combined water demand from the City of Lacey would be as shown in Table 3.1.1. As the project sites are currently within the City's water system boundary, the development of these sites is anticipated in the City's water system plan. The estimated number of connections used in the City's plan for the full buildout of the site is greater than the project estimates; therefore, the proposed projects are fully covered under the City's plan and no additional infrastructure needs are triggered by the proposed developments.

Table 3.1.1
Cumulative Water Demands – Average Daily Demand (gpd)

Project/Alternative	Quiemuth Village Alternative 1	Quiemuth Village Alternative 2
Quiemuth Casino-Resort Alternative A	598,659	729,197
Quiemuth Casino-Resort Alternative B	541,589	672,127
Quiemuth Casino-Resort Alternative C	521,119	651,657

All numbers in the above table assume year-round irrigation associated with reclaimed water use. Without year-round irrigation, average daily volumes are reduced by 102,200 gpd for projects including Quiemuth Village Alternative 1 and 168,700 gpd for projects including Quiemuth Village Alternative 2.

3.1.2 Development of On-site Supply Sources.

The feasibility of developing on-site supply sources must consider the following:

- Water availability
- Water quality

3.1.2A Water Availability

Based on hydrogeological understanding of the area, several aquifers exist below the Quiemuth Village site. The City of Lacey withdraws its water from the Vashon Advance Outwash Aquifer (Qga/Qva), the pre-Vashon Gravel Aquifer (Sea Level Aquifer) (Qpg/Qc) and the Quaternary and Tertiary Deposits Aquifer (Undifferentiated) (Qpg/TQu). The City of Lacey source wells in the vicinity of the Quiemuth Village site draw primarily from the Qpg/Qc and Qpc/TQu aquifers. Either of these aquifers can supply enough water to serve the Quiemuth Village site. A hydrogeological report can be found in Appendix B.

As part of the well system, a reservoir to provide fire, standby equalization and operational flows will be required. The size of the storage would depend on the number of wells and flow supplied along with the amount of reclaimed water to be used.

In addition to developing the wells, a secondary source is recommended, if available. For the Quiemuth Village site, it would be advisable to negotiate an emergency intertie agreement with the City of Lacey which would allow the city to provide water to the site in the event of well failure.

3.1.2B Water Quality

The water quality of the local aquifers is generally good except with the exception of localized areas where iron and manganese exceed the US EPA's secondary maximum contaminant levels. This is the case for the City of Lacey's Hawk Prairie wells and is also likely to be present at the Quiemuth Village site. If present, iron and manganese can be treated but the treatment system will add a considerable cost to the development of an on-site water system. Iron and manganese are not considered hazardous by the state or US EPA; but can lead to nuisance staining and odor issues in the water distribution system and fixtures.

The effects of the Hawks Prairie Reclaimed Water Ponds on water quality has been the subject of a multi-year study conducted by the LOTT Alliance. That study has identified two chemicals (PFPeA and NDMA) that have been introduced into the aquafer through the wastewater effluent. Existing 10-year projections indicate that the aquafers underlying the Quiemuth Village property will be impacted by the presence of these two chemicals. The study's authors recently finalized their analysis of the risk posed by these two chemicals and strategies to mitigate any risk that may be present (See Appendix A).

Other contamination risks in the area include industrial contamination sites in the area. These are identified in the hydrogeological report in Appendix B.

3.1.2C Cumulative Impacts of Development

Based on the findings within the hydrological report in Appendix C, the water quantities estimated in Table 3.1.1 can be supplied by either the Qpg/Qc aquifer or the Qpc/TQu aquifer. Modifications could be made to the well pumps, booster pumps and reservoirs to

accommodate service to both the Quiemuth Village and Quiemuth Casino-Resort projects from a single point if both projects were to be constructed concurrently.

3.1.3 Onsite Water Transmission

Onsite water distribution will be through a network of 8" to 16" pipes, consisting of potable water pipes and reclaimed water pipes (if reclaimed water is used). The pipe system will be laid out to provide the required water supply to buildings and fire hydrants.

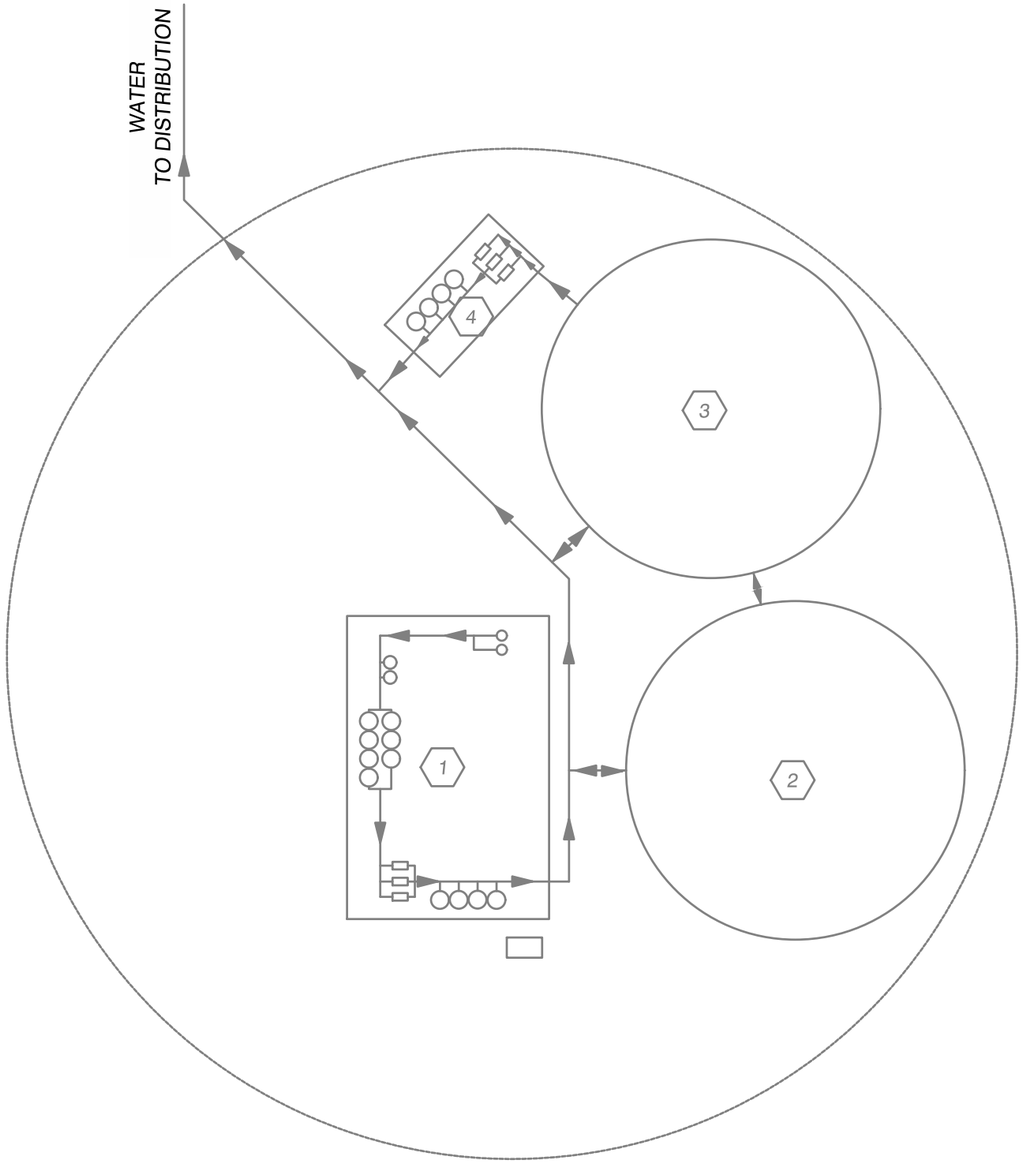
If onsite wells are used to supply water to the site, an on-site 1,300,000-gallon reservoir will also be required with an associated booster pump to ensure fire flow volumes are available. If reclaimed water is used for fire protection, a smaller reservoir and booster system would also be required for potable water service to the site.

A conceptual layout of onsite well, treatment plant, and reservoir system to serve the project is shown in Drawing 3.1. As shown, two 67-foot diameter tanks are proposed to meet the storage requirements. To provide 1,300,000 gallons of storage, each tank would be approximately 25 feet tall.

3.1.4 Reclaimed Water System

If a reclaimed water system is utilized, a dual distribution system will be required; one for the potable water serving the buildings and the second for the reclaimed water. Currently, the City of Lacey has 16" reclaimed water lines in Main Street NE and Gateway Boulevard NE. These lines are large enough to provide the necessary volumes of reclaimed water for both landscape irrigation and fire suppression water; however, the LOTT Alliance currently does not produce enough reclaimed water to put these lines to use. Planned upgrades to the Martin Way Water Reclamation Plant will address this shortage. Based on the LOTT Alliance Capital planning documents those upgrades are currently planned for 2035.

In the reclaimed system, the 1,300,000-gallon water reservoir and booster mentioned in section 3.1.3 would be for reclaimed water to provide the necessary fire flow. Effluent from the wastewater treatment plant would go directly to the reservoir. The overflow from the reservoir would be directed to the discharge point for the treatment plant. In the event of low reservoir level, a control valve in the potable water backup pipeline would open and supply backup potable water through an "air gap" as required by International Plumbing Code to the reservoir until the low-level condition had been satisfied. If Alternative 2 is developed, a small amount of potable water would be necessary to supplement the reclaimed water system.



ITEM NO.	DESCRIPTION
1	40' x 60' PUMPHOUSE, TREATMENT PLANT AND BOOSTER PUMP STATION
2	67' DIAMETER RESERVOIR HEIGHT VARIES BY DEMAND
3	67' DIAMETER x 25' TALL RESERVOIR FOR FIRE FLOW DEMAND
4	15' x 30' BUILDING FOR FIRE BOOSTER PUMP STATION

LEGEND

- SANITARY CONTROL AREA
- WATER LINE
- FLOW DIRECTION

CONCEPTUAL WATER SOURCE AND TREATMENT

SCALE: 1"= 30'
DATE: 08/03/2022
ISSUED BY: SGB

OLSON ENGINEERING INC. LAND SURVEYORS ENGINEERS 360-695-1385 222 EVERGREEN, VANCOUVER, WA 98660

PROJECT: QUIEMUTH VILLAGE

JOB NO. A10353.01.01
DWG. NO. 3.1

FILE NAME: Z:\A10000\A10300\A10360\A10367\Sewer-Water\ALT 1 08282022.dwg

If reclaimed water were used for fire protection, the reservoir would be used to supply this flow. The necessary storage volume is the fire protection water required, which is 960,000 gallons, plus the reclaimed water demand for other uses. A minimum reservoir size would be the fire flow plus average reclaimed demand (136,379 gallons for Alternative 1) plus dead storage (60,000 gallons) for a total of 1,156,379 gallons. This increases to 1,266,222 with Alternative 2. Allowing for some reserve a 1,300,000-gallon reservoir would be built for the reclaimed water system. If a pond infiltration disposal concept, similar to the Hawks Prairie ponds, is used to discharge the treated effluent, this volume could be incorporated into the ponds. This would eliminate the need for a standalone reservoir.

Removing toilet flush water from the reclaimed water demand would allow the reservoir to be sized only for fire flow volumes, as the landscaping irrigation could be foregone in the event of a fire. This would reduce the size of the reservoir to approximately 1,000,000 gallons.

All surplus water not needed for the reclaimed water system would be discharged to surface waters or groundwater under an NDPES permit. See Table 2.3A and 2.3B for the volume of flows that may be discharged.

3.2 Wastewater Strategies

The site is located within the City of Lacey's current corporate limits. The city has existing sanitary sewer lines within easements and roadways on or adjacent to the site. The city utilizes wastewater treatment plants operated by the LOTT Clean Water Alliance.

In addition to the city, an option exists to develop an independent collection system and on-site treatment facility.

3.2.1 City of Lacey

The City of Lacey currently receives wastewater from approximately 58,000 people, which equates to approximately 15% of the Thurston County population. Based on the city's sewer system plan update, dated April 2015, the city's wastewater system consists of 47 pump stations and in excess of 1,000,000 feet of sewer pipe. This system currently transports approximately 3,000,000 gallons of sewer to the LOTT Alliance treatment plants on an average day. Connection to the city's sanitary sewer system would require that the tribe enter into an intergovernmental agreement with the city, payment of connection fees and monthly service charges.

The City's existing 24" sewer lines on or near the site have sufficient capacity to accept wastewater from the proposed Quiemuth Village project. No offsite improvements would be necessary to access these lines; however, there is one downstream pump station to the northwest of the project site that will require upgrades as a condition of service. The city refers to this pump station as Pump Station #49. Currently, that pump station can accept flows from the site up to approximately 100,000 gallons per day. Once that limit is exceeded, the pump station will need to be upgraded to receive more flows. Based on the

previously mentioned conversations with the city's Utility Engineer, the pump station was originally constructed with these upgrades in mind, so only a minimal number of modifications need to be made to the structures on the site. Pumps and electrical equipment will be required to be replaced. Sanitary sewer flows from the western portion of the Quiemuth Village site would naturally flow by gravity to this portion of the City's system.

There are LOTT Alliance sanitary sewer trunklines in Martin Way East which, according to the City of Lacey's review comments dated September 14, 2022, may require upgrading prior to full buildout of the site. The LOTT Alliance's 2022 Capacity report indicates that there is sufficient capacity in this line to support expected growth through the year 2040; however the city has indicated that very little of the project site was projected to flow to that sewer line. The portion of the trunkline that is most likely to need replacement is a 15" section of pipe to the southwest of the project site. Sanitary sewer flows from the eastern portion of the Quiemuth Village site would naturally flow by gravity to this portion of the City's system.

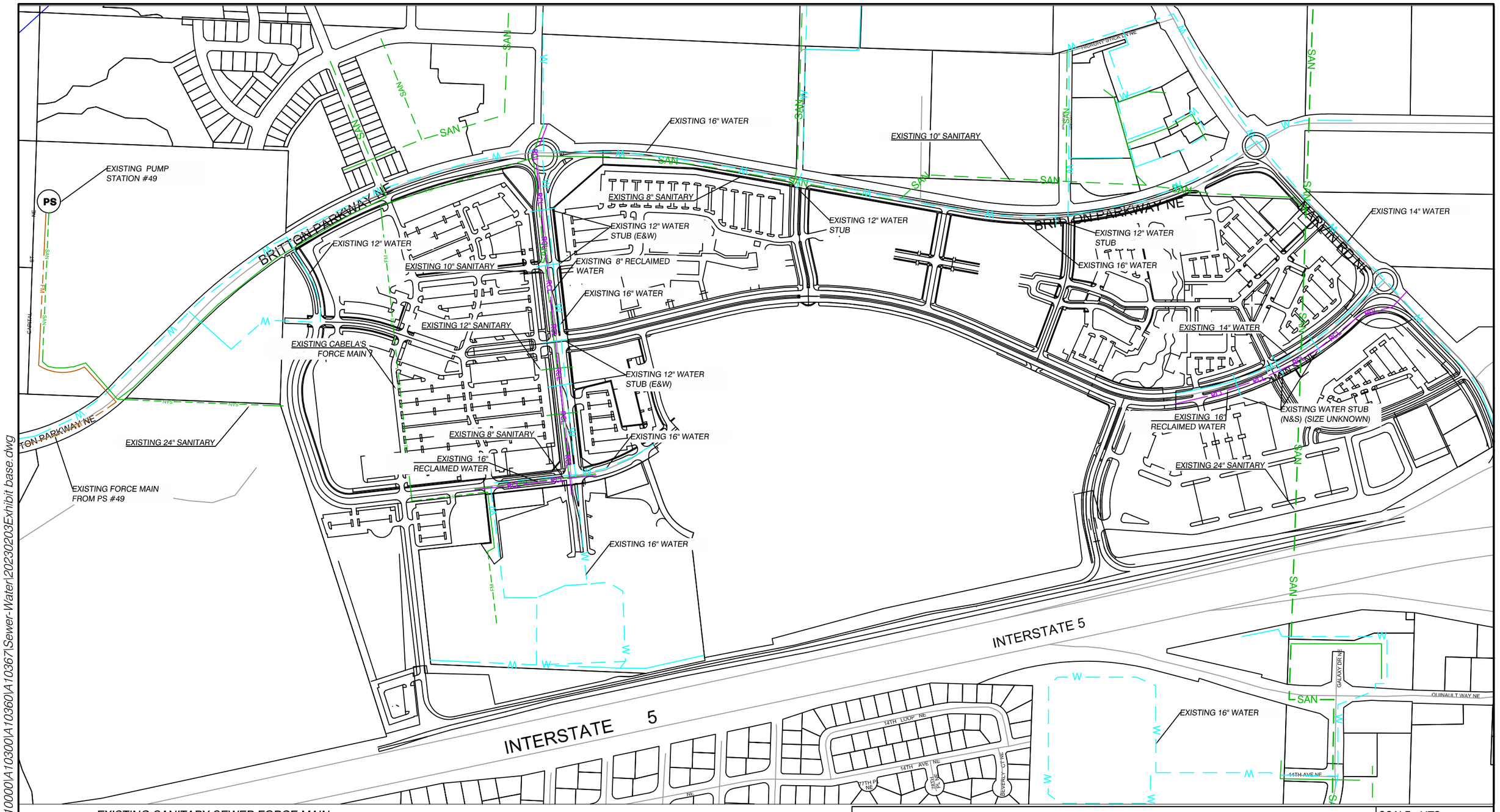
The existing utilities adjacent to the site are depicted in Drawing E1.0 and the two offsite sanitary sewer projects are shown in Drawing E 2.0.

3.2.1A Cumulative Impacts of Development

Upon completion of both the Quiemuth Village project and the Quiemuth Casino-Resort project, the combined wastewater volumes to be sent to the City of Lacey would be as shown in Table 3.2.1. As the project sites are currently within the City's corporate boundary, the development of these sites is anticipated in the City's general sewer plan. The estimated flow from the site used in the City's plan for the full buildout of the site is greater than the project estimates; therefore the proposed projects are fully covered under the City's plan and no additional infrastructure needs are triggered by the proposed developments.

Table 3.1.1
Cumulative Wastewater Production – Average Daily Flow (gpd)

Project/Alternative	Quiemuth Village Alternative 1	Quiemuth Village Alternative 2
Quiemuth Casino-Resort Alternative A	363,544	397,112
Quiemuth Casino-Resort Alternative B	321,579	355,147
Quiemuth Casino-Resort Alternative C	307,904	341,472



FILE NAME: Z:\A10000\A10300\A10360\A10367\Sewer-Water\20230203Exhibit base.dwg

- EXISTING SANITARY SEWER FORCE MAIN
- EXISTING SANITARY SEWER PIPE
- EXISTING POTABLE WATER PIPE
- EXISTING RECLAIMED WATER PIPE

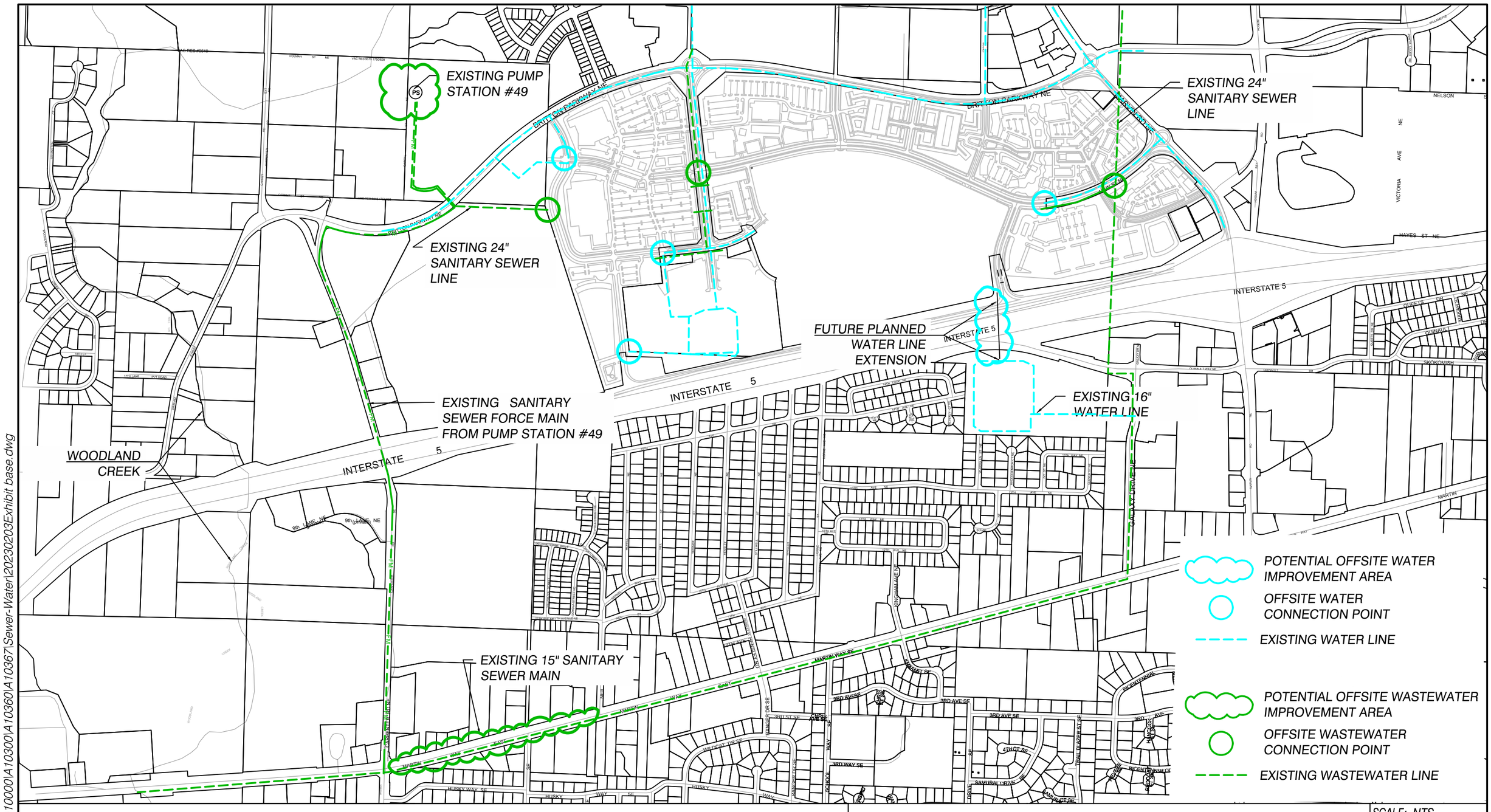
EXISTING UTILITY LOCATIONS

SCALE: NTS
DATE: 06/02/2023
ISSUED BY: SGB

OLSON ENGINEERING INC. LAND SURVEYORS ENGINEERS 360-695-1385 222 EVERGREEN, VANCOUVER, WA 98660

PROJECT: QUIEMUTH VILLAGE

JOB NO. A10367.01.01
DWG. NO. E1.0



FILE NAME: Z:\A10000\A10300\A10360\A10367\Sewer-Water\20230203Exhibit base.dwg

OFFSITE UTILITY IMPROVEMENT LOCATIONS

SCALE: NTS	
DATE: 10/26/2022	
ISSUED BY: SGB	
JOB NO. A10367.01.01	
DWG. NO. E 2.0	

OLSON ENGINEERING INC. LAND SURVEYORS ENGINEERS 360-695-1385 222 EVERGREEN, VANCOUVER, WA 98660

PROJECT: QUIEMUTH VILLAGE

3.2.2 Regulatory Requirements

Wastewater treatment plants in Washington State typically require a National Pollution Discharge Elimination System (NPDES) permit for discharge to waters of the state. These permits are issued by Washington State Department of Ecology with comment requested from Washington State Fish and Wildlife, National Marine Fisheries, and any other agency that may be affected by the discharge.

At this time, the LOTT Clean Water Alliance holds NPDES permits for their wastewater treatment plants. When the plants are expanded, they will be required to obtain a new permit to cover the increased discharge.

As long as all treatment and disposal operations take place on lands in federal trust, tribal operations are not subject to local or state regulations; instead, they are subject to regulation by the Federal government.

Treated wastewater from a treatment plant can be discharged after obtaining an NPDES permit from US Environmental Protection Agency for subsurface discharge or pond infiltration discharge. For discharge to an offsite water body, a Washington State Department of Ecology issued NPDES permit is required.

3.2.3 Wastewater Collection

Due to the topography of the site, a combination of gravity sewer pipes and the use of a sewage pump station will be utilized to collect and route the sewage from the buildings to the wastewater treatment plant. Connection to the city's sanitary sewer lines will likely avoid the need for a pump station.

For the on-site alternatives, a portion of the sewage will be routed to a sewage lift station; however, the majority of property can be served by gravity sewer lines.

Any sewage lift station would include a foul air collection and scrubbing system to control odors. In addition, the lift station would be a duplex system with backup power to improve reliability. This backup power can be supplied by an emergency standby power generator.

3.2.4 Wastewater Treatment Options

3.2.4A LOTT Clean Water Alliance

Currently, the LOTT Clean Water Alliance provides wastewater treatment services to the City of Lacey. According to the LOTT Clean Water Alliance's Capital Improvement Plan, LOTT's main treatment plant is the Budd Inlet Treatment Plant, a 17 MGD treatment facility discharging to the Puget Sound. LOTT also operates two treatment plants which are capable of producing a total of 3 MGD of Class A Reclaimed Water. One of these facilities is co-located with the Budd Inlet Treatment Plant in Olympia, while the other is south of the Quiemuth Village site on Martin Way East in Lacey. The water reclamation plants currently

discharge to the Hawks Prairie Ponds and to the Woodland Creek Groundwater Recharge facility.

The total treatment plant capacity for the LOTT Clean Water Alliance is 20 MGD with approximately 14 MGD currently being used. Per the LOTT Alliance's 2022 Capacity Assessment Report, future upgrades to the Martin Way Water Reclamation Plant are scheduled for 2038.

Capital planning for LOTT includes projections from the City of Lacey, which indicate that the Quiemuth Village site will develop as a mixed-use site and discharge to the LOTT system through the City of Lacey's collection system. This planning document assumes a total flow from the Quiemuth Village site and other tribe owned property of approximately 712,000 gpd. This far exceeds the projected wastewater flow from Quiemuth Village.

3.2.4B Onsite Wastewater Treatment Plant

Several treatment alternatives exist including extended aeration/activated sludge, aerated lagoons and sequence batch reactors. However due to the constraints on available area and the likely requirement for surface or subsurface discharge, the recommended treatment plant is a membrane bioreactor plant (MBR) with ultraviolet radiation (UV) treatment of the membrane filtrate. This would allow the facility to treat the wastewater to Washington State's Class A reclaimed water standards to facilitate surface or subsurface discharge as well as reclaimed water use.

3.2.4B(1) Wastewater Effluent Requirements

The most common method of disposing the treated effluent is to discharge it to a body of water and, where possible, to reuse it for irrigation, washing of sidewalks and parking lots and fire protection. This type of reuse would be classified as Class A reclaimed water as defined by the Washington Department of Ecology in Washington Administrative Code 173-219. Within Washington State, the Class A reclaimed water requirements for surface or subsurface water discharge are as follows:

30-day BOD_5 (mg/l)	30
30-day $CBOD_5$ (mg/l)	40
30-day TSS (mg/l)	30
7-day BOD_5 (mg/l)	45
7-day $CBOD_5$ (mg/l)	60
7-day TSS (mg/l)	45
30-day BOD_5 removal (%)	85
30-day $CBOD_5$ removal (%)	65
30-day TSS removal (%)	85
PH	6.5-8.5
Monthly turbidity, NTU	0.2
Maximum turbidity, NTU	0.5
7-day total coli forms (#/100 ml)	2.2
Total coli forms Max (#/100 ml)	23

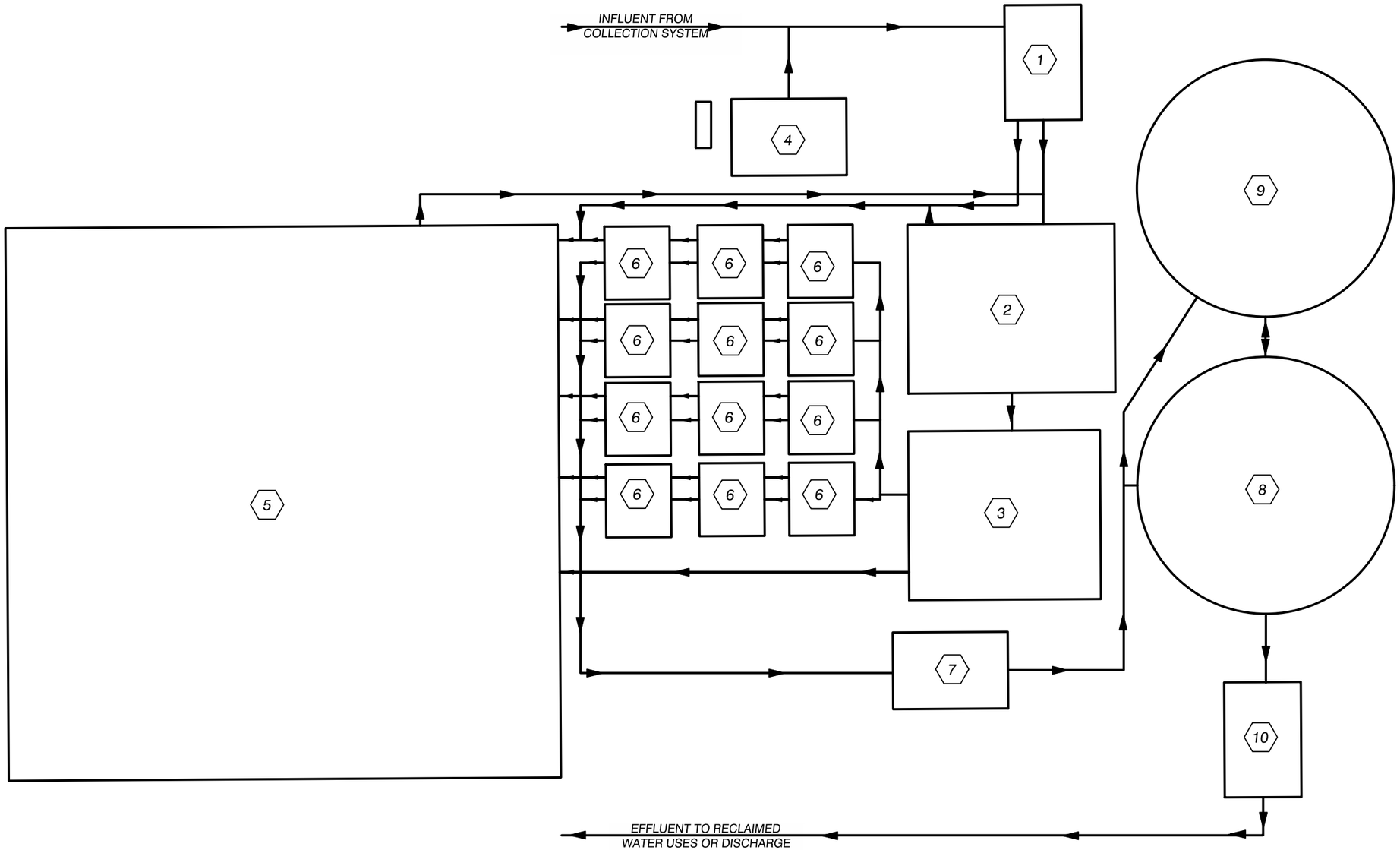
Lands placed in federal trust are not required to meet Washington State standards; however, the US Environmental Protection Agency has historically permitted water reclamation plants with standards based on the limits set by the state in which the plant is located. The US Environmental Protection Agency does not currently have regulations for reclaimed water standards; but has recognized Washington State's limits as an approved program for use.

3.2.4B(2) Recommended Treatment Plant

The recommended treatment plant would encompass the following systems:

- Headworks – consisting of flow measurement and screening systems.
- Equalization Basins
- Aerated Tanks with Submersed Membranes (Membrane Bioreactors)
- UV and chlorine disinfection
- Sludge stabilization basin
- Supernatant recycle pump station
- Operations building
- Reclaimed Water Storage Reservoir

A conceptual layout of an MBR wastewater treatment plant to serve the project is shown in Drawing 3.2.



ITEM NO.	DESCRIPTION
1	30' x 20' SCREENING FACILITY
2	54" x 44' x 14' EQUALIZATION BASIN
3	50' x 44' x 14' AERATION BASIN
4	30' x 20' OFFICE AND LABORATORY
5	144' x 144' x 12' BIOSOLIDS HANDLING FACILITY
6	19' x 17' x 14' MEMBRANE BASIN
7	30' x 20' DISINFECTION FACILITY
8	67' DIAMETER RESERVOIR HEIGHT VARIES BY DEMAND
9	67' DIAMETER X 25' TALL RESERVOIR FOR FIRE FLOW DEMAND
10	30' x 20' BOOSTER PUMP STATION

LEGEND

- SOLIDS OR SLUDGE LINE
- LIQUID LINE
- FLOW DIRECTION

CONCEPTUAL MBR
WASTEWATER TREATMENT
PLANT

SCALE: 1"= 30
DATE: 08/03/2022
ISSUED BY: SGB

OLSON ENGINEERING INC. LAND SURVEYORS ENGINEERS 360-695-1385 222 EVERGREEN, VANCOUVER, WA 98660

PROJECT: QUIEMUTH VILLAGE

JOB NO. A10350.01.01
DWG. NO. 3.2

FILE NAME: Z:\A10000\A10300\A10360\A10367\Sewer-Water\ALT 1 08282022.dwg

Should both the Quiemuth Village and Quiemuth Casino-Resort projects be built concurrently and wish to utilize the same treatment plant, the treatment plant depicted in Drawing 3.2 would need to be modified to include additional MBR basins and more capacity for biosolids handling and equalization. The larger treatment facility would fit most appropriately in the location proposed for the Quiemuth Casino Resort project.

- Headworks

The influent pipe is routed through a flow meter and into the screening facility prior to discharge to the equalization tank. The screening facility would be constructed with a 3mm self-cleaning screen. The screen size is required to provide protection to the ultrafiltration membranes from hair and stringy material. The headworks would be covered, and the foul air generated from the facility would be scrubbed for odor removal. Screened solids would go to the biosolids stabilization basin.

- Covered Holding or Equalization Basin (Anoxic Zone)

The equalization basin is designed to handle peak flows to the MBR tanks. The basin would have two chambers so that one of the chambers can be isolated to allow for maintenance. When nitrogen removal is necessary, the equalization basin can be equipped with an anoxic zone. Nitrate removal is accomplished in the anoxic basin by an anoxic suspended growth bacterial process. In this process nitrates are converted to nitrogen gas. From the equalization basins, the wastewater flows to the aeration tanks. Tank sludge would go to the biosolids stabilization basin.

- Aerated Tank with Submersed Membranes (MBR)

Within the aeration tanks, ammonia is converted to nitrates. Within the tank, a fine bubble diffuser system provides the mixing and oxygen required for the process to occur. Blowers supply air to the process.

The membranes are submerged in the aeration tank with the water being drawn through the membranes under vacuum. The filtered water that has passed through the membranes is called permeate. From the membranes, the permeate is then routed to the UV treatment system.

The MBR system is operated at a higher solids concentration than conventional activated sludge. This makes it ideal for treating high strength wastewater with varying flows typical of commercial wastewater. Sludge from the aerated tank is sent to either the biosolids stabilization basin or back to the equalization tank for further treatment.

- Disinfection Facilities

UV disinfection facilities provide substantial disinfection and deactivation for wastewater prior to surface disposal or reclaimed water uses, as proposed for the project.

The UV disinfection facilities are located next to the MBR tanks and accomplish the disinfection by a bank of UV lamps contained in a stainless steel channel. The

benefit of UV disinfection is that it reduces the need of disinfectant chemicals. UV disinfection will lower coliform levels to what is required for Class A reuse water; however, residence time in the reclaimed water reservoir would allow certain bacteria to regrow. The addition of chlorine (in the form of sodium hypochlorite) prior to storage will maintain the proper levels throughout the process

- Biosolids Stabilization Basin

The biosolids stabilization basins will be sized to stabilize, thicken and process biosolids for approximately 2 years without need of cleaning. When cleaning is required, the biosolids go through a thickening process before they are dried and then disposed of through incineration or delivery to a municipal solid waste landfill or a dedicated sludge disposal site. Land application to fertilize certain non-contact agricultural crops is the most common form of sludge disposal site. Other forms of sludge disposal sites include surface dumping sites and landfills dedicated to sludge disposal only.

The cost of sludge disposal could be greatly reduced by adding features to the treatment plant to produce Class A biosolids. Class A biosolids can be produced in a variety of ways through additional dewatering and anerobic digestion; along with composting, heat pasteurization, pH manipulation, or some combination of the three. In general, heating the dewatered sludge for a short period at temperatures around 150 degrees Fahrenheit will reduce pathogen levels to within Class A standards. The additional dewatering would increase the total effluent discharge by as much as 1,500 gallons on an average day. The Class A biosolids could be used as agricultural fertilizer or gardening compost for local homeowners or farmers.

- Operations Building

This building houses the plant controls and blowers and acts as a chemical storage and handling facility. It also houses the office and laboratory facilities.

- Reclaimed Water Reservoir

A reservoir would be constructed to store reclaimed water for use as irrigation water and/or fire suppression water

3.2.3B(3) Treatment

An MBR wastewater treatment plant with UV disinfection will provide effluent with the following quality:

- BOD < 1 mg/L
- TSS 0 mg/L
- Turbidity < 0.1 NTU
- Total Kjeldahl Nitrate (TKN) < 2mg/L
- Total Coliform < 2MPN/100 ml
- Ammonia-N < 0.2 mg/L

3.2.4B(4) Disposal

There are three main methods of discharge available on the Quiemuth Village site.

- Surface Disposal

Created wetlands and groundwater recharge could be utilized to dispose of the treated effluent. A series of ponds would be created to provide stabilization and polishing of the finished effluent. These ponds would allow for minimal infiltration and substantial evaporation. Initial hydrogeologic studies indicate that approximately 0.37 acres of infiltration beds would be required to effectively infiltrate the effluent (see Appendix B). This area would need to be confirmed with a more detailed analysis of the underlying till formations to ensure that the infiltration rate is consistent with the initial estimates. Infiltration areas can be located in open space areas or under parking lots. As such, the total area necessary is not a limiting factor in the ability to utilize infiltration methods to dispose of effluent. Water would be withdrawn from the ponds and infiltrated through either shallow infiltration ponds, subsurface infiltration beds or through groundwater injection.

More commonly, surface disposal involves discharging treated effluent to a surface water body. At this project site, the nearest existing surface water body is Woodland Creek, which is approximately 3,500 feet west of the site. As the creek is not on the proposed trust lands, a discharge permit from the Washington Department of Ecology would be required for this discharge. Woodland Creek is subject to multiple conditions defined by the 303(d) listing and Water Quality Implementation Plan for the Henderson Inlet Watershed. Permit requirements to discharge to Woodland Creek will likely be stringent making this option unlikely and removing it from further consideration.

- Subsurface Disposal

Treatment plant effluent could be injected directly into the ground after disinfection. This would be accomplished by creating one or more injection wells on site. These wells would be drilled to a depth above the aquifer that the effluent is being injected into. The effluent would be injected under pressure into the wells where it would continue to be treated as it moved through the vadose zone and into the aquifer. An injection well would be regulated by the EPA under their Underground Injection Control program.

The quantity of water being injected into the aquifer would be substantially lower than the amount being withdrawn for water supply; therefore, the aquifer can accept the volumes anticipated. The injection point for the effluent should be placed as far as practicable from the potable water well to ensure maximum final polishing and treatment as it moves through the vadose zone and aquifer before being withdrawn.

- Reuse

Recycling the treated water for use a toilet flush, landscape irrigation and fire protection can greatly reduce the amount of potable water required. If reclaimed

water is to be used, a 1,300,000-gallon reservoir will be required to meet the operational and fire requirements of the development. See section 3.2.4B for standards which water reuse shall meet.

3.2.4B(5) Treatment Plant Operation

Operation and maintenance of a wastewater treatment plant requires certified operators, continuous monitoring and reporting to State or federal agencies and a commitment to treating wastewater to the highest quality of all times. As the Nisqually Tribe has experience in operating a wastewater treatment plant, the tribe should be capable of managing this plant as well. Certified operators would need to operate the plant.

Another option would be to contract with a local utility or private operations firm is to operate and maintain the facility.

Once contracted, the Contract Operator would pay for all operation and maintenance costs. The Tribe would repay those costs plus a percentage of those costs as an operation fee.

Based on the size of the proposed wastewater facility it is expected that the plant operation would only require one or two full time equivalent employee if operated under contract or in conjunction with the existing Nisqually treatment plant.

3.2.4B(6) Use of Existing Treatment Plant

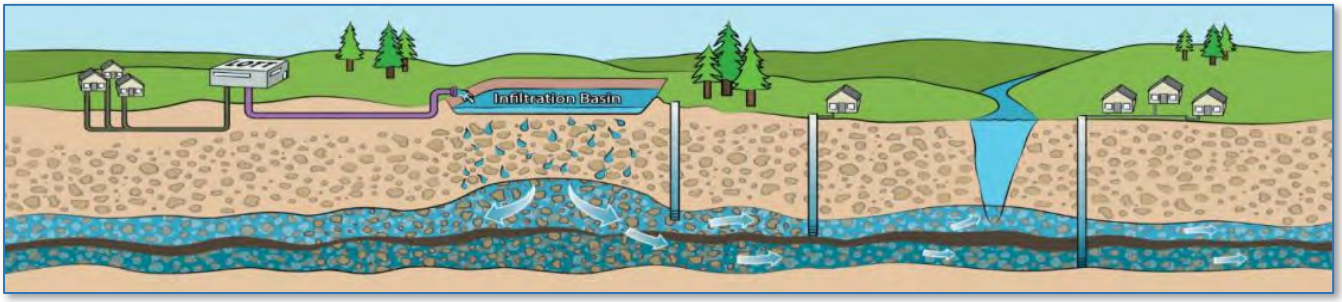
It would be possible to utilize the existing treatment facility owned by the tribe. The current 0.55 MGD facility would need to be upgraded to receive the additional flows; but consolidating the operations may provide some benefit. This option would involve complicated jurisdictional issues with the pipeline routing, with city, county, state and railroad right-of-way involved. It also would require the purchase of right-of-way for a pump station. It is likely that the cost to construct approximately 10 miles of force main and two large pump stations, along with the cost to upgrade the existing treatment facility would prove less cost effective than building a new treatment facility; therefore, this option was eliminated from detailed analysis in this study.

Appendix A - LOTT Clean Water Alliance Reclaimed Water Infiltration Study

LOTT Clean Water Alliance
Reclaimed Water Infiltration Study

Project Summary

AUGUST 23, 2022



Prepared by

905 Plum Street SE, Suite 200
Olympia, WA 98501

In association with

Intertox, Inc.
Windward Environmental, LLC

Prepared for

500 Adams Street NE
Olympia, WA 98501

This page intentionally left blank.

Contents

1.0 Introduction 1-1
1.1 Background 1-1
1.2 Study Purpose 1-1
2.0 Scope of Study 2-1
2.1 Early Public Engagement 2-1
2.2 Study Structure 2-1
2.3 Study Management and Oversight 2-1
3.0 Water Quality Characterization (Task 1) 3-1
3.1 Study Area 3-1
3.2 Monitoring Approach 3-2
3.3 Water Quality Characterization Results 3-3
3.3.1 General Water Quality 3-3
3.3.2 Residual Chemicals in Wastewater and Reclaimed Water 3-3
3.3.3 Residual Chemicals in Groundwater and Surface Water 3-5
3.3.4 Comparison of Residual Chemicals Across All Sampled Waters 3-6
3.4 Water Quality Characterization Findings and Conclusions 3-6
4.0 Treatment Effectiveness Evaluation (Task 2) 4-1
4.1 Hydrogeologic Investigation 4-1
4.2 Tracer Test 4-3
4.3 Water Quality Testing 4-4
4.4 Groundwater Modeling 4-6
4.5 Exposure Point Concentrations 4-9
4.6 Treatment Effectiveness Findings and Conclusions 4-9
5.0 Human Health Risk Assessment (Task 3.1) 5-1
5.1 Screening Level Evaluation 5-1
5.2 Chemicals of Interest 5-1
5.3 Exposure Scenarios 5-2
5.4 Human Health Risk Assessment Results 5-4
5.5 Human Health Risk Assessment Findings and Conclusions 5-6
6.0 Ecological Risk Assessment (Task 3.2) 6-1
6.1 Problem Formulation 6-1
6.2 Groundwater Modeling and COPEC Refinement 6-2
6.3 Exposure Analysis 6-2
6.4 Effects Characterization 6-2
6.5 Risk Characterization 6-2
6.6 Ecological Risk Assessment Findings and Conclusions 6-3
7.0 Cost Benefit Analysis (Task 4) 7-1
7.1 Advanced Treatment Options 7-1

7.2 Cost Estimates 7-2
7.3 Cost Benefit Analysis Results 7-2
7.4 Cost Benefit Analysis Findings and Conclusions 7-4
8.0 Summary 8-1
8.1 Steps Beyond the Study 8-2
8.2 Acknowledgements 8-3

Tables

Table 7-1. Present Value (20-Year) Costs for Advanced Treatment Options 7-2
Table 7-2. Risk Reduction Benefit for Treatment Options 7-2

Figures

Figure 3-1. Study Areas 3-2
Figure 3-2. Number of Residual Chemical Detections in Wastewater and Reclaimed Water 3-4
Figure 3-3. Treatment Effectiveness of the 14 Residual Chemicals Consistently Detected in Reclaimed Water 3-4
Figure 3-4. Residual Chemical Detections in Groundwater and Surface Water 3-5
Figure 3-5. Concentrations of Residual Chemicals Detected in Reclaimed Water, Groundwater and Surface Water 3-6
Figure 4-1. Well Drilling at the Hawks Prairie Property 4-2
Figure 4-2. Photograph of Lysimeter Prior to Installation 4-2
Figure 4-3. Monitoring Well Network 4-3
Figure 4-4. Reclaimed Water Flow Directions (Shallow Aquifer) 4-4
Figure 4-5. Carbamazepine Concentration over Time in the Subsurface 4-5
Figure 4-6. Residual Chemical Attenuation in Groundwater at Hawks Prairie 4-5
Figure 4-7. Computer Modeling of Groundwater 4-6
Figure 4-8. Additional Monitoring Well Locations 4-7
Figure 4-9. Modeled Extent of Reclaimed Water Movement (2020 and 2120; Shallow Aquifer) 4-8
Figure 7-1. PFPeA Cost/Risk Comparison 7-3
Figure 7-2. NDMA Cost/Risk Comparison 7-4

Appendices

Appendix A Study Document Inventory A-1

Key Acronyms and Abbreviations

ADD	average daily dose
AOP	advanced oxidation process
AWQC	ambient water quality criteria
BAC	biologically activated carbon
BAF	bioaccumulation factor
BIRWP	Budd Inlet Reclaimed Water Plant
BITP	Budd Inlet Treatment Plant
CAG	Community Advisory Group
COI	chemical of interest
COPEC	chemical of potential ecological concern
CSM	conceptual site model
DWEL	Drinking Water Equivalent Level
EAE	ecological assessment endpoint
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
g/d	grams per day
GAC	granular activated carbon
H_2O_2	hydrogen peroxide
HHRA	Human Health Risk Assessment
HI	hazard index
HQ	hazard quotient
LADD	lifetime average daily dose
LECR	lifetime excess cancer risk
LOAEL	lowest-observed-adverse-effect level
LOTT	LOTT Clean Water Alliance
mg/kg-d	milligrams per kilogram body weight per day
mg/L	milligrams per liter
mgd	million gallons per day
MCL	maximum contaminant level
MLE	more likely exposure
MRL	minimum reporting limit
MWRWP	Martin Way Reclaimed Water Plant
NDMA	N-Nitroso dimethylamine
NOEC	no-observed-effect concentration
O&M	operations and maintenance
O_3	ozone
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluoro-1-butanesulfonic acid
PFHxA	perfluoro-n-hexanoic acid

PFOA	perfluoro octanoic acid
PFPeA	perfluoropentanoic acid
PRA	probabilistic risk assessment
PV	present value
Q_c	Sea Level (or “Deep”) Aquifer
Q_{va}	Vashon Advance (or “Shallow”) Aquifer
RME	reasonable maximum exposure
RO	reverse osmosis
ROC	receptor of concern
RWIS	Reclaimed Water Infiltration Study (or Study)
STF	Science Task Force
TRV	toxicity reference value
TSC	Technical Sub-Committee
UCL	upper confidence limit
U.S. EPA	United States Environmental Protection Agency
UV	ultraviolet light

1.0 Introduction

The LOTT Clean Water Alliance (LOTT) conducted a study to answer community questions and concerns about residual chemicals that may remain in reclaimed water after treatment, and what happens to them when reclaimed water is infiltrated into the ground. Residual chemicals is the term used to refer to chemicals that come from pharmaceuticals, personal care products, household products, and commercial/industrial uses. This extensive scientific effort, referred to as the Reclaimed Water Infiltration Study (RWIS, or Study), took place over a 10-year period, with initial scoping in 2013, and concluding with final technical reporting and community outreach efforts in 2022. This Project Summary provides an overview of Study activities, highlights key findings, and identifies how the Study results are informing next steps and actions LOTT is considering regarding long-term management of wastewater resources.

1.1 Background

LOTT provides services to treat and manage wastewater for the urban areas of Lacey, Olympia, and Tumwater in Thurston County, Washington (at the southern end of Puget Sound). Since 2006, LOTT has also produced Class A reclaimed water at the Budd Inlet Reclaimed Water Plant (BIRWP) and Martin Way Reclaimed Water Plant (MWRWP) for irrigation and other non-drinking purposes. Some of the reclaimed water produced at the MWRWP is used to recharge (replenish) groundwater using rapid-infiltration basins at the LOTT Hawks Prairie Recharge Basins (Hawks Prairie site). Class A reclaimed water meets high water quality standards and is approved by the State Departments of Health and Ecology for many uses, including groundwater replenishment. Infiltration of reclaimed water at the Hawks Prairie site is permitted by the Department of Ecology.

LOTT chose to conduct the Study in response to community concerns about the safety of residual chemicals in reclaimed water. These concerns arose in part because the local climate differs from regions where much of the research related to these topics has previously been conducted. Developing a full understanding of the issue is important to LOTT, since the original long-range plan for meeting future wastewater needs includes expanding reclaimed water production and developing additional groundwater recharge facilities.

1.2 Study Purpose

The goal of the RWIS is to provide local scientific data and community perspectives to help policymakers make informed decisions about future reclaimed water treatment and uses. The primary study question was established as: “What are the risks from infiltrating reclaimed water into groundwater because of chemicals that may remain in the water from products people use every day, and what can be done to reduce those risks?” LOTT and the wider community will use the findings of the Study to inform future choices about water resource management and protection of public health and the environment.

2.0 Scope of Study

The RWIS is a “dual track” study involving science and community engagement. Public engagement helped identify key questions to address as part of the scientific effort, and fostered community conversations about future wastewater management options. The science portion of the Study focused on data gathering regarding the presence of residual chemicals and analyses of their fate and potential impacts in the environment.

2.1 Early Public Engagement

The RWIS began with an intensive scoping process that included active public engagement. A Community Advisory Group (CAG) was formed in 2012, consisting of local residents with diverse backgrounds and interests. This group was heavily involved in the scoping process, and has provided feedback and insights throughout the Study effort. Scoping was informed by public feedback gathered through stakeholder interviews, a phone survey, focus groups, and public workshops. Over 80 community questions about residual chemicals in reclaimed water were identified through these efforts. The questions fell into four main categories, which provided the framework for implementing the scientific study.

2.2 Study Structure

The RWIS was comprised of four primary tasks:

- Task 1: Water Quality Characterization – analyze groundwater, surface water, wastewater, and reclaimed water for residual chemicals and other water quality indicators.
- Task 2: Treatment Effectiveness Evaluation – examine how infiltrated reclaimed water interacts with soils and local groundwater, and what happens to residual chemicals over time in the environment.
- Task 3: Risk Assessment – identify the risk to human health (Task 3.1) and ecological health (Task 3.2) associated with infiltrating reclaimed water into groundwater.
- Task 4: Cost Benefit Analysis – determine the costs and benefits of various levels of treatment for reclaimed water and identify other strategies to address risks related to residual chemicals.

2.3 Study Management and Oversight

Several different groups and committees were involved in guiding and implementing the Study. The LOTT Board of Directors directed staff to conduct the Study and received regular Study updates. The LOTT Technical Sub-Committee (TSC), consisting of the Public Works Directors or designees for each of LOTT’s partner jurisdictions, as well as LOTT’s Executive Director, Operations & Facilities Director, and Engineering Director, served as the Steering Committee for the Study. A consultant team, led by HDR Engineering, Inc., provided the technical resources to implement Study activities. LOTT staff managed the effort and coordinated public engagement activities.

In addition to LOTT and HDR staff, three other groups provided oversight and input during the Study:

- An independent peer review panel (Panel), consisting of experts representing the fields of public health, toxicology, hydrogeology, and wastewater treatment, provided third party review throughout the Study. This group was organized and facilitated by the National Water Research Institute. The Panel met seven times throughout the course of the Study to provide comment on the scientific merit of task work plans, results, and reports. The Panel's findings and the project team's response to these were published as reports and are included as part of the Study's document archive.
- The Science Task Force (STF) included local scientific experts from the Cities of Lacey, Olympia, and Tumwater, Thurston County, Washington State Departments of Health and Ecology, and the Squaxin Island Tribe. The STF ensured that the Study took into account local scientific knowledge and concerns. This group provided frequent feedback throughout the study, from planning to results.
- The CAG members ensured that the Study answered questions important to the public, and that communication about the Study process and results could be easily understood. The CAG received updates and provided feedback on the Study at key junctures or milestones and their feedback was invaluable.

3.0 Water Quality Characterization (Task 1)

Task 1 of the study, completed in January 2017, characterized the types of residual chemicals present in LOTT's influent (untreated) wastewater, advanced secondary water treated at LOTT's Budd Inlet Treatment Plant (BITP), reclaimed water produced at the BIRWP and MWRWP, local area groundwater, and local area surface water. The results of Task 1 served as inputs to the later study tasks.

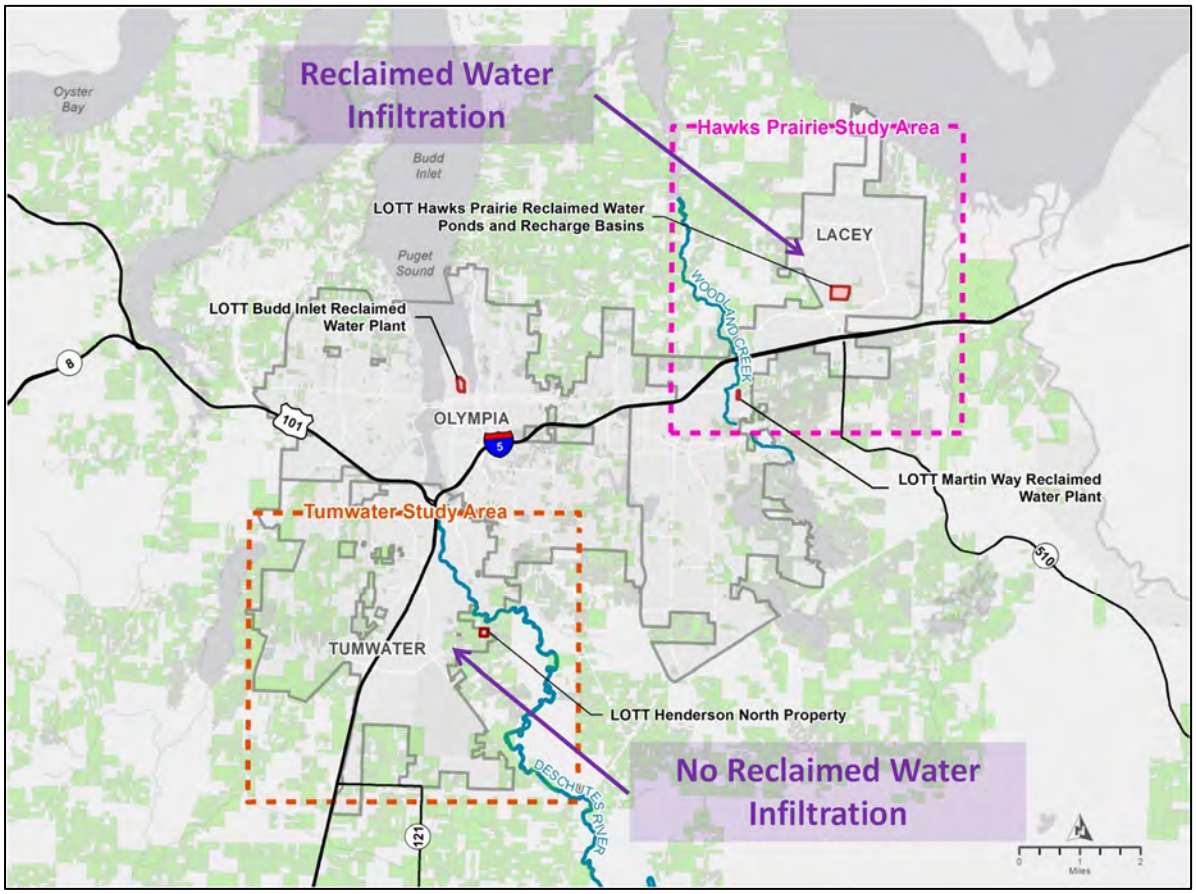
3.1 Study Area

Water quality sampling was conducted over the course of approximately one year, from November 2014 to December 2015, in two study areas, both approximately 16 square miles in size (see Figure 3-1):

- The Hawks Prairie Study Area is located in the vicinity of north Lacey, between Woodland and McAllister Creeks. LOTT's Hawks Prairie property is located within this study area. Infiltration of Class A reclaimed water has occurred in the recharge basins at this location since 2006.
- The Tumwater Study Area is located in the vicinity of Tumwater, between the Black and Deschutes Rivers. While reclaimed water has never been used for infiltration to groundwater within this study area, it is used for irrigation at several sites and LOTT may develop an infiltration site in this area in the future.

Both study areas are characterized as having residential and rural-residential land uses, with moderate commercial activity. Portions of each study area are sewered, while other portions are served by on-site septic systems (as indicated by the green shading in Figure 3-1). Drinking water comes from groundwater, provided to some residents by public supply wells and to others by individual residential wells. Wastewater generated in these areas and treated at LOTT's treatment facilities comes primarily from residential, commercial, and institutional (such as colleges, hospitals, and nursing homes) sources, with very few industrial inputs.

Figure 3-1. Study Areas



3.2 Monitoring Approach

The following water quality samples were obtained in these study areas:

- **Wastewater/Reclaimed Water**. Quarterly sampling of influent wastewater (wastewater coming into the plants prior to treatment) and treated reclaimed water was conducted at the BITP, BIRWP, and MWRWP, to identify residual chemicals present in LOTT's wastewater and reclaimed water, and to assess the effectiveness of treatment performance on these chemicals.
- **Groundwater**. Single samples were obtained from each of the following: 33 residential wells, 22 public supply wells, one spring, and one monitoring well. These samples were evenly divided between the two study areas. The intent was to obtain a characterization of groundwater quality across a wide geography, and in both shallow and deep aquifers.
- **Surface water**. A total of 44 samples at 12 discrete sites were obtained from Woodland Creek and the Deschutes River, and their tributaries, with an equal number of samples and sites in each of the study areas. Samples were obtained at various times of the year to assess variability under different flow conditions: two samples during late summer low-flow conditions, one sample after the first large fall storm, and one sample during winter high flow conditions.

For this task, water samples were analyzed for a range of water quality parameters regulated in drinking water and wastewater and for 129 unregulated residual chemicals found in household products, pharmaceuticals, and personal care products. Most of these have been reported at very low concentrations (on the order of parts per trillion, or nanograms per liter) in previous studies of treated wastewater, groundwater, and surface waters. While tens of thousands of such chemicals exist in commonly used products, the chemicals sampled for as part of this study were selected specifically to include those that are:

- Representative of large classes of compounds,
- Commonly detected in reclaimed water,
- Routinely used in the wastewater industry for evaluating treatment effectiveness and/or potential human or ecological health effects, and
- Reliably quantified in laboratory analysis

3.3 Water Quality Characterization Results

The results of the water quality characterization effort are described below.

3.3.1 General Water Quality

LOTT's two reclaimed water treatment facilities consistently produce high quality Class A reclaimed water that meets Washington State permit requirements with respect to conventional parameters, nutrient removal, and indicator bacteria reduction.

Groundwater quality was fairly consistent between the two study areas and reflected the general understanding of local area groundwater quality. For example, nitrate levels ranged from non-detect to 6.5 mg/L, with elevated concentrations observed mainly in areas served by residential on-site septic systems.

Surface water quality was consistent with characterizations in previous studies. In Woodland Creek, state surface water quality standards were met, with the exception of some dissolved oxygen, pH, and fecal coliform concentrations. In the Deschutes River watershed, State surface water quality standards were met, with the exception of low dissolved oxygen in Munn Lake, and high fecal coliform concentrations in Chambers and Percival Creeks.

3.3.2 Residual Chemicals in Wastewater and Reclaimed Water

The occurrence of residual chemicals in the influent wastewater and treated reclaimed water was fairly consistent between the two facilities, in terms of the chemicals observed most frequently and their concentrations. Of the residual chemicals analyzed, 88 were detected at least once in wastewater and 64 were detected at least once in reclaimed water. Figure 3-2 summarizes the number of residual chemicals detected at various detection frequencies, in both wastewater and reclaimed water. While LOTT's treatment processes are highly effective at removing common chemicals (such as acetaminophen, ibuprofen, triclosan, and caffeine) to levels below detection, fourteen residual chemicals were consistently detected in all eight samples taken of reclaimed water (four samples at each treatment facility). These fourteen chemicals are summarized in Figure 3-3, organized according to the level of removal achieved through LOTT's existing treatment processes.

Figure 3-2. Number of Residual Chemical Detections in Wastewater and Reclaimed Water

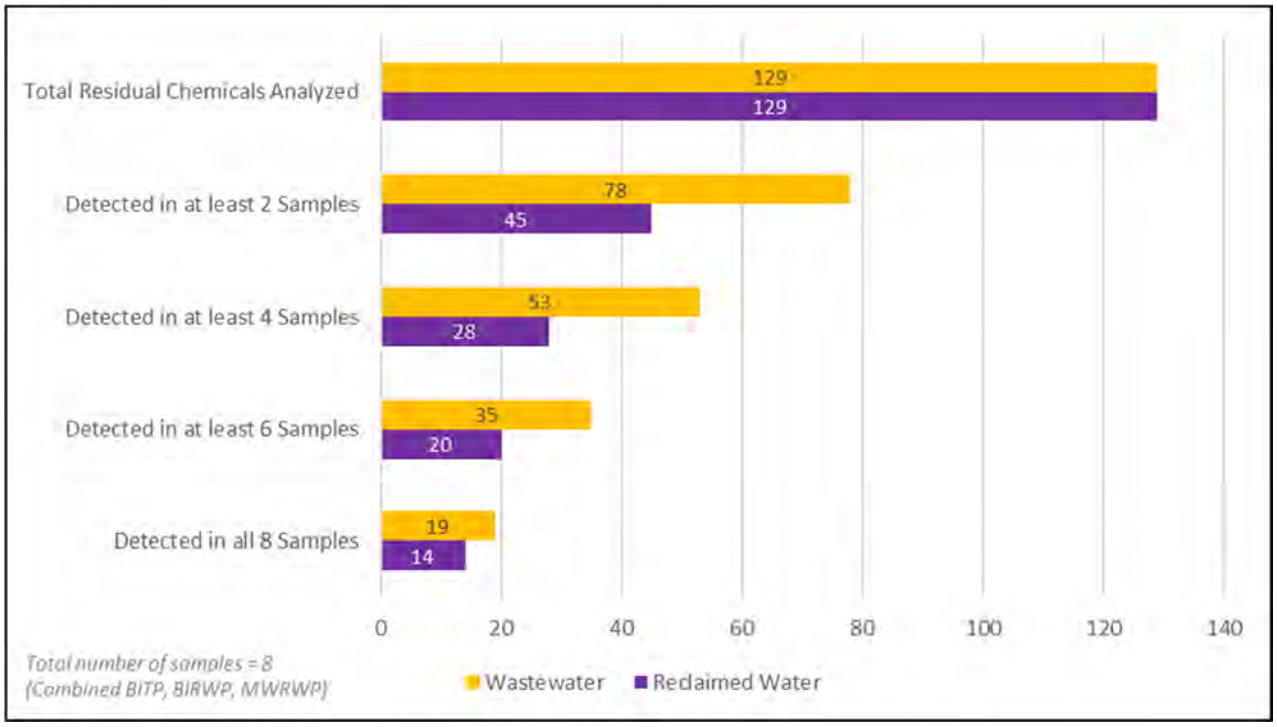
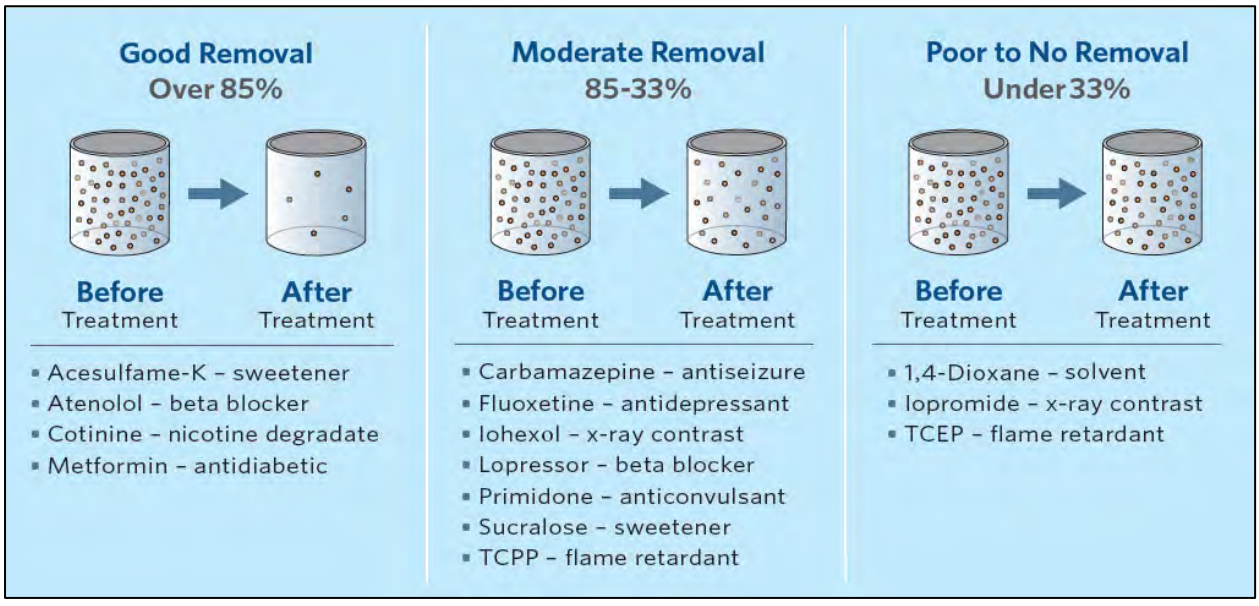


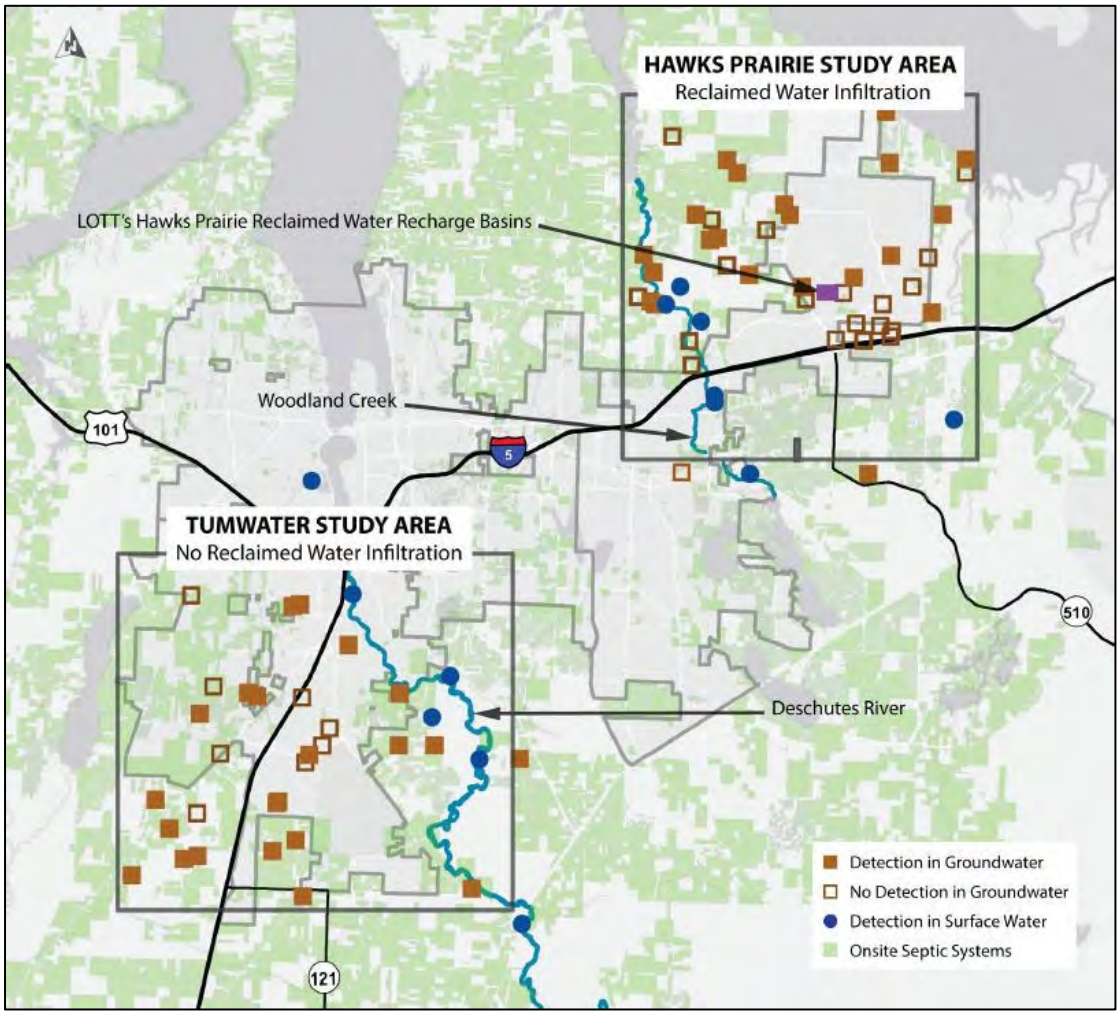
Figure 3-3. Treatment Effectiveness of the 14 Residual Chemicals Consistently Detected in Reclaimed Water



3.3.3 Residual Chemicals in Groundwater and Surface Water

Residual chemicals were detected in both groundwater and surface water throughout the two study areas, at lower frequencies and lower concentrations when compared with the residual chemicals observed in reclaimed water. Potential sources of residual chemicals present in the environment include septic systems, stormwater runoff, and reclaimed water (where it is utilized). Figure 3-4 identifies locations of residual chemical detections in the environment.

Figure 3-4. Residual Chemical Detections in Groundwater and Surface Water

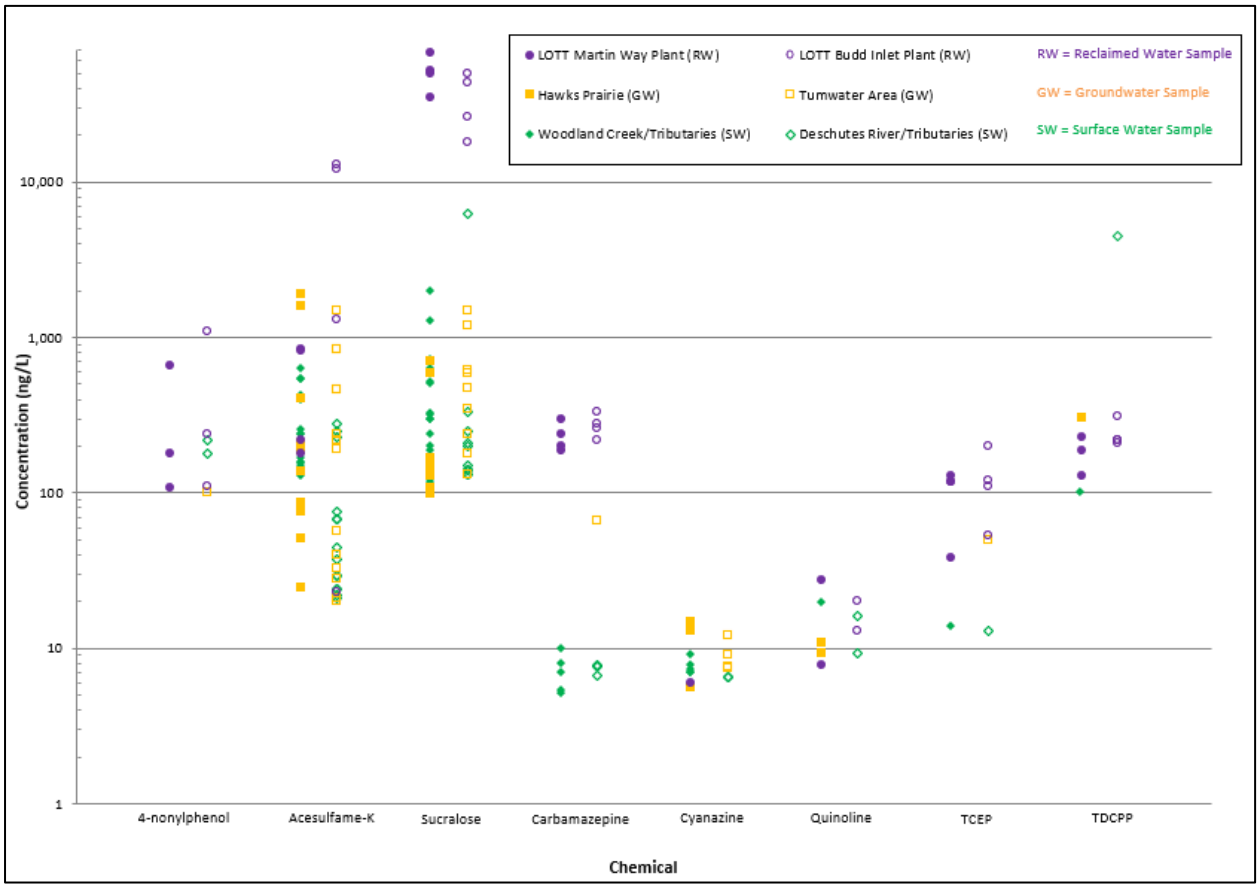


The residual chemicals most frequently detected in groundwater and surface water were the sweeteners acesulfame-K and sucralose. In groundwater these were detected 30 and 21 times (out of a total of 57 collected samples), at concentrations up to 1,900 and 1,500 ng/L, respectively. Similarly, in surface water, these sweeteners were detected 30 and 26 times (out of a total of 44 collected samples), at concentrations up to 630 and 6,300 ng/L, respectively. Other residual chemicals were found sporadically at low levels.

3.3.4 Comparison of Residual Chemicals Across All Sampled Waters

Eight residual chemicals were detected at least once in all three types of water: reclaimed water, groundwater, and surface water. Figure 3-5 depicts the ranges of concentrations observed for these chemicals.

Figure 3-5. Concentrations of Residual Chemicals Detected in Reclaimed Water, Groundwater and Surface Water



3.4 Water Quality Characterization Findings and Conclusions

LOTT's treatment processes are effective at removing many residual chemicals in wastewater, but some chemicals do remain after treatment. Of the residual chemicals analyzed, about 40% were detected in influent wastewater, and of those, about 40% were removed during treatment to non-detect levels. Only 14 were consistently observed in reclaimed water in all sampling events at both facilities, and of those, removal efficiency varied from good (>85%) to poor (<33%). The occurrence of observed residual chemicals in treated reclaimed water was fairly consistent at both facilities, in terms of the chemicals observed most frequently and their concentrations.

Residual chemicals were detected in groundwater and surface waters at concentrations lower than those observed in reclaimed water, and they were detected both in areas where groundwater infiltration of reclaimed water is occurring (Hawks Prairie/Woodland Creek) and where it is not (Tumwater Area/Deschutes River). Results of this study are comparable to those reported in 60 studies that were conducted elsewhere in the country and the world regarding the occurrence of residual chemicals in reclaimed water and the environment, and which were reviewed as part of the Study.

4.0 Treatment Effectiveness Evaluation (Task 2)

Task 2 of the study, conducted in 2018-2021, examined how infiltrated reclaimed water interacts with soils and local groundwater, and what happens to residual chemicals over time in the environment. This task is referred to as Treatment Effectiveness Evaluation due to the focus on evaluating the extent to which soil aquifer treatment might be at play after reclaimed water is infiltrated into the ground. This portion of the study was not intended to examine the degree to which wastewater or reclaimed water treatment processes remove residual chemicals – that was addressed as part of Task 1: Water Quality Characterization.

LOTT's Hawks Prairie site was used as the focus study site for Task 2, as groundwater recharge has been in operation at this location since 2006. The primary activities conducted in this task were characterization of local area hydrogeology, implementation of a tracer test to track movement of the infiltrated water, and hydrogeologic modeling to estimate chemical concentrations at various locations over time.

4.1 Hydrogeologic Investigation

Hydrogeologic conditions in the Hawks Prairie area have been previously characterized through multiple efforts carried out to support various objectives, including the permitting and design of the Hawks Prairie site in the early 2000's. From these previous characterizations, it is known that reclaimed water infiltrated at the Hawks Prairie site flows into the Vashon Advance Outwash (Q_{va}) aquifer underlying the site. This is referred to as the shallow aquifer in the Study. This aquifer is a large, regional aquifer composed of sand and gravel. It varies in thickness but the depth to the bottom of the aquifer is generally less than 150 feet below ground surface. The predominant groundwater flow direction in this aquifer is to the southwest. Some water moves from the shallow aquifer into a deeper aquifer, the Sea Level (Q_c) aquifer. This aquifer, also referred to as the deep aquifer in the Study, is comprised of coarse sand and gravel and is generally present at depths of 190 to 260 feet below ground surface. Groundwater movement in the deeper aquifer is generally to the east.

The Study built upon these prior characterizations to improve the understanding of the local area hydrogeology to a level of detail needed to support design of a tracer test and to refine an existing computer model of the area's hydrogeology.

Field investigations were completed including drilling soil borings, collecting and analyzing soil samples, and installing monitoring wells on and around the LOTT Hawks Prairie property. Infiltration Basin #4 (Basin 4) was divided into half for its eventual use in the tracer test, and three lysimeters were installed in each half of the basin (six total lysimeters) at depths of 10, 25 and 50 feet. Instruments measuring soil moisture, conductivity, temperature and oxygen were also installed at the same depths adjacent to the lysimeters. Fourteen monitoring wells were installed; ten wells were completed within the shallow aquifer and four wells were completed in the deep aquifer. These wells were drilled on LOTT property, City of Lacey rights-of-way, and in some cases private property, for which legal agreements and decommissioning of the wells after completion of the monitoring was required. Groundwater levels were measured in all wells. Soil samples were collected and laboratory tested for a variety of hydraulic properties. *In-situ* aquifer testing was conducted including slug testing and aquifer pumping

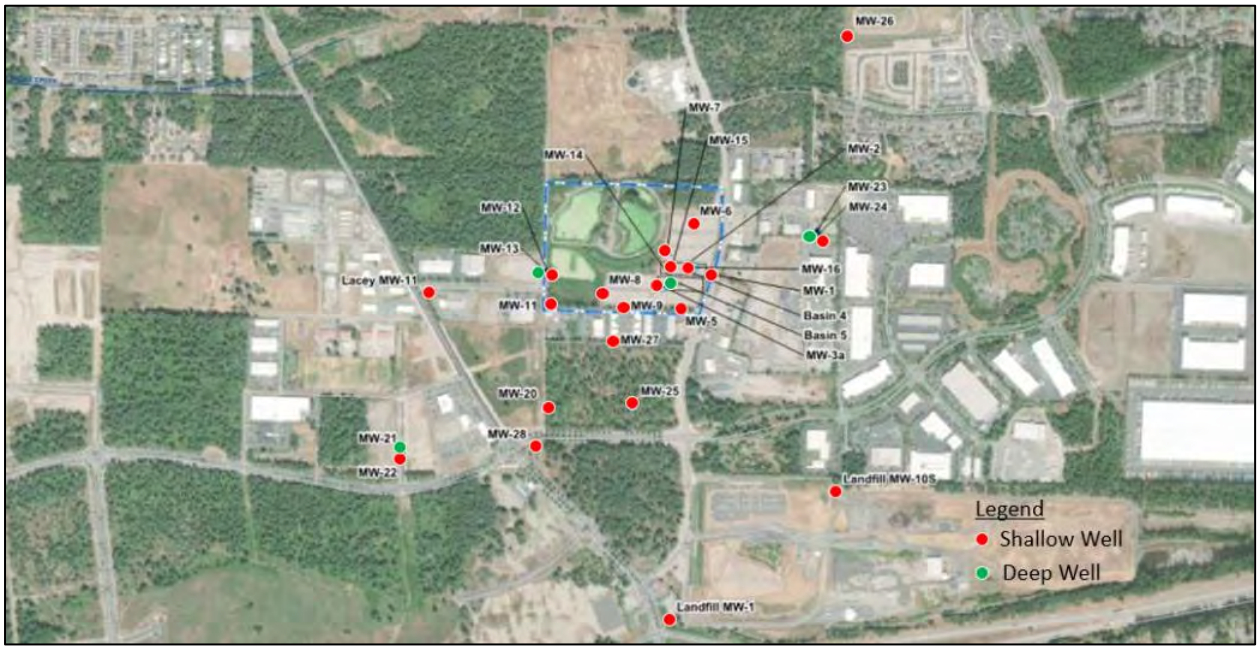
tests. This field work was completed from June through September 2017. Figure 4-1 and Figure 4-2 depict some of the field work that took place during this time.

The newly-installed lysimeters and wells, along with 29 existing wells owned by LOTT and others, were used to develop a comprehensive groundwater monitoring network to support the tracer test (see Figure 4-3).

Figure 4-1. Well Drilling at the Hawks Prairie Property

Figure 4-2. Photograph of Lysimeter Prior to Installation

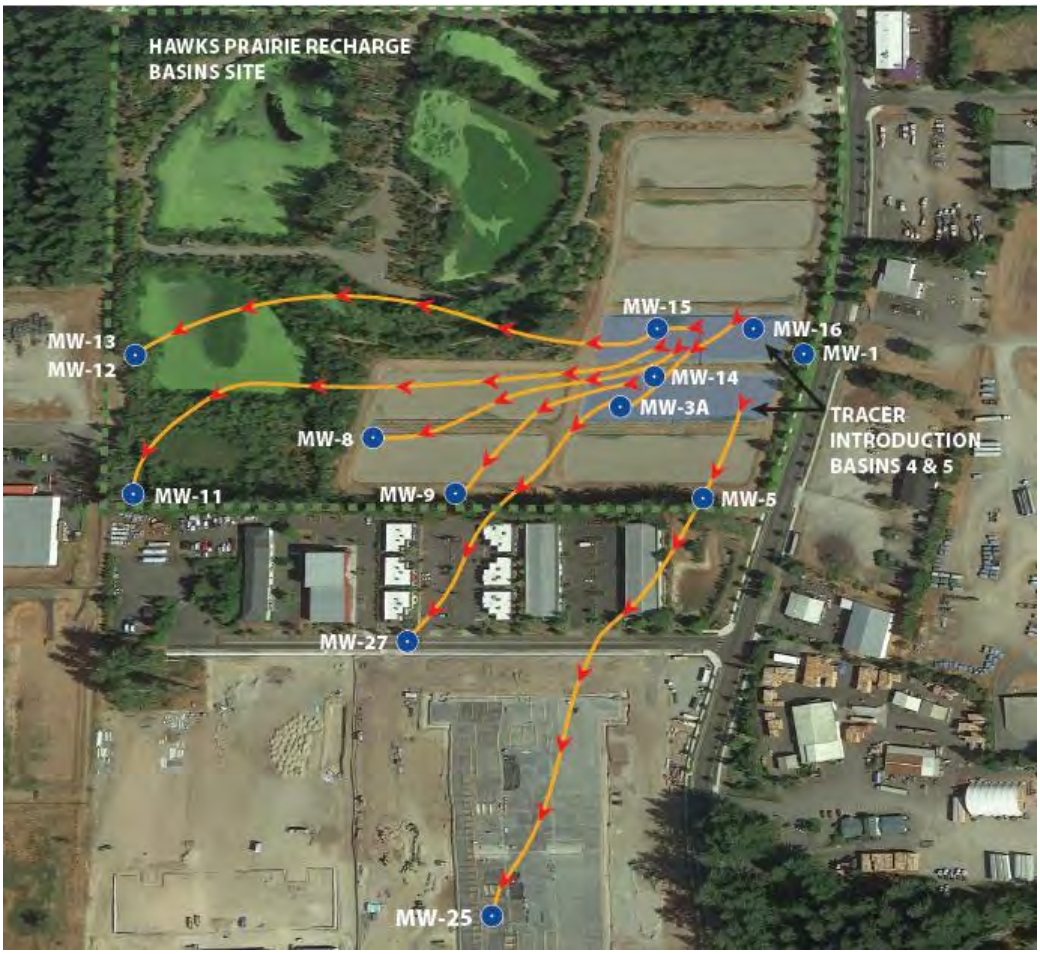
Figure 4-3. Monitoring Well Network



4.2 Tracer Test

With the monitoring network established, LOTT conducted a 10-month tracer test in 2018, to track the movement of reclaimed water and understand changes in residual chemical concentrations that take place within a half mile from the Hawks Prairie site. Two non-toxic, inert chemicals (potassium bromide and sulfur hexafluoride) were introduced to the reclaimed water entering Basins 4 and 5. Sampling data from 26 of the monitoring wells were used to characterize the flow direction and travel time of reclaimed water movement in groundwater away from the infiltration site. The tracer test data confirmed the general understanding that flow in the shallow aquifer at this location is generally to the south and west (see Figure 4-4).

Figure 4-4. Reclaimed Water Flow Directions (Shallow Aquifer)



Travel times vary widely as reclaimed water moves away from the site due to the heterogeneity of the hydrogeologic system, but in general it takes 30-40 days for reclaimed water to move from the infiltration basins through the unsaturated zone and into the shallow aquifer. Some reclaimed water advances into the deep aquifer in this time frame as well.

4.3 Water Quality Testing

During the tracer test, quarterly water quality samples were taken from reclaimed water, the lysimeters, and 13 of the monitoring wells to determine if and how water quality (and in particular, the concentration of residual chemicals) changes over time and distance from the point of recharge.

Data from the lysimeters and monitoring wells on the Hawks Prairie site indicate that water quality changes as reclaimed water moves through the unsaturated zone. Total organic carbon decreases by approximately 50% and biodegradable dissolved organic carbon decreases to below detection limits, providing evidence that soil aquifer treatment is at work with microorganisms breaking down organic material. Orthophosphate decreases by approximately 40%, indicating sorption of phosphorus to soil and aquifer material.

Many residual chemicals exhibited attenuation in concentration as a result of multiple mechanisms at work in the subsurface (dispersion amongst native groundwater, biodegradation, and sorption). An example of such attenuation is depicted in Figure 4-5, for the anti-epileptic medication carbamazepine. Figure 4-6 summarizes the level of attenuation for all residual chemicals that were consistently detected in reclaimed water during the tracer test. “Good” attenuation is defined as the chemical not being detected after approximately 30 days of travel time in groundwater, while “Poor” attenuation is defined as having multiple detections beyond 30 days of travel time.

Figure 4-5. Carbamazepine Concentration over Time in the Subsurface

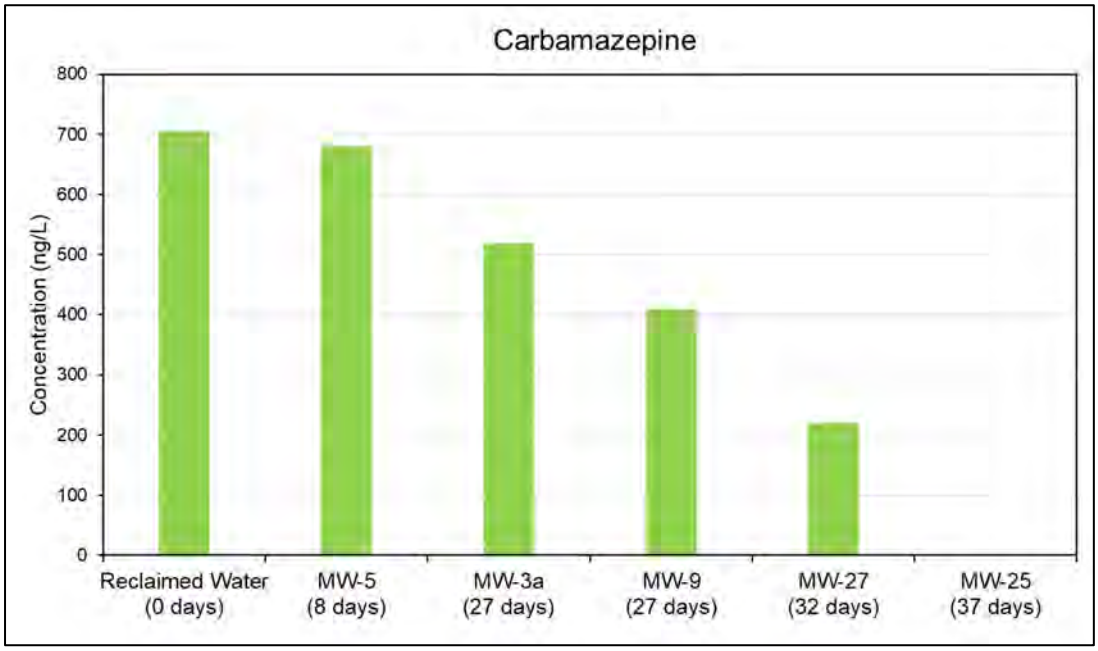
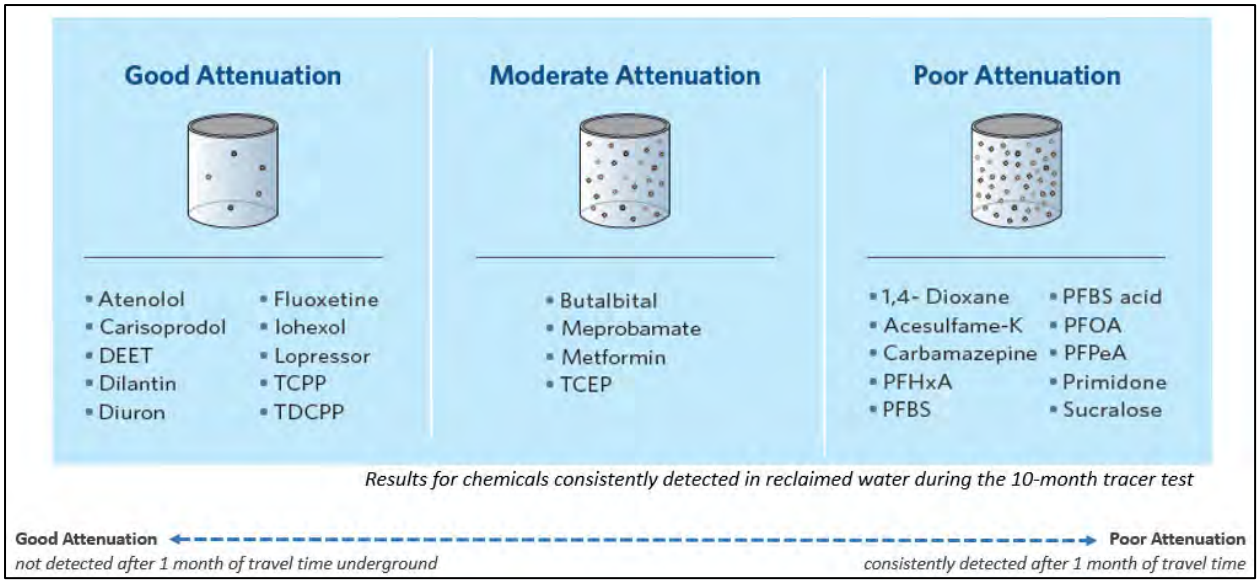


Figure 4-6. Residual Chemical Attenuation in Groundwater at Hawks Prairie



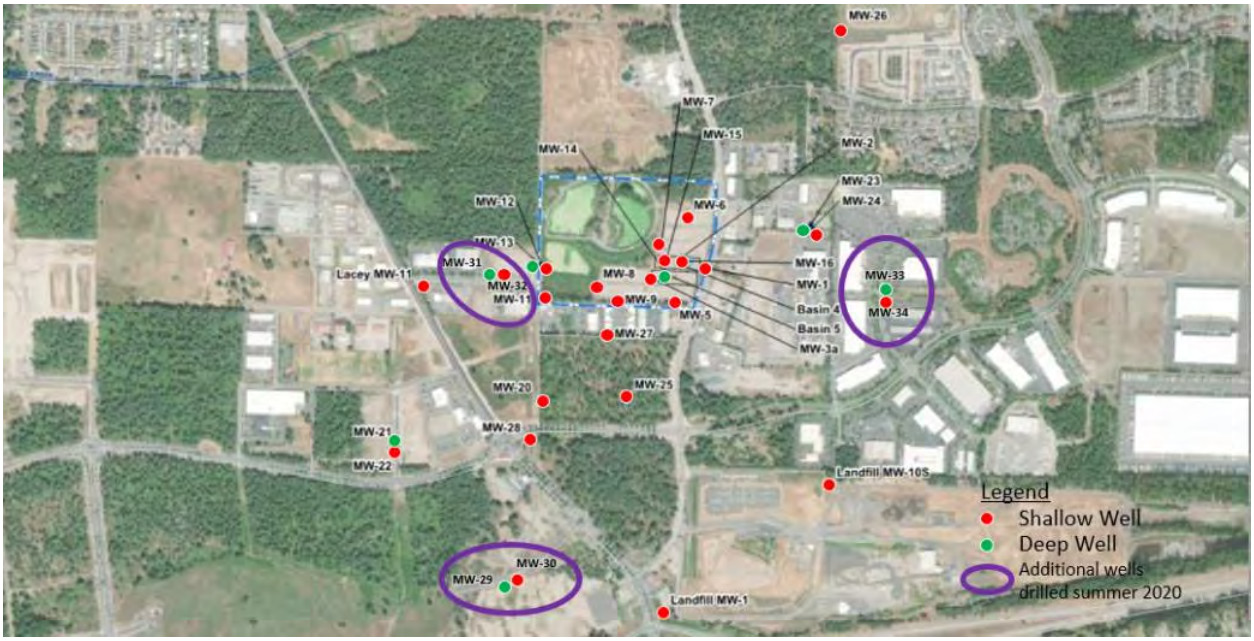
4.4 Groundwater Modeling

The results of the tracer test, as well as the increased understanding of the local area hydrogeology through the expanded monitoring well network, were used to update an existing hydrogeologic model to estimate reclaimed water flow paths and residual chemical concentrations within a 30 square mile area and out to 100 years into the future. The groundwater flow model platform of MODFLOW and the chemical fate and transport modeling platform of MT3DMS were used to conduct this work.

Figure 4-7. Computer Modeling of Groundwater

Preliminary model results generated in late 2019 and early 2020 yielded findings that were not fully anticipated, in terms of movement of reclaimed water between the shallow and deep aquifers, and the direction of flow in the portion of the deep aquifer in the vicinity of the Hawks Prairie property. To fill data gaps in the hydrogeologic knowledge of localized areas surrounding the Hawks Prairie site, six additional wells were drilled in 2020, primarily to increasethe understanding of the connectivity between the shallow and deep aquifers in this area (see Figure 4-8).

Figure 4-8. Additional Monitoring Well Locations



This information confirmed that the thickness of the geologic unit that separates the shallow and deep aquifers (i.e., the “Kitsap Formation”) decreases significantly to the south of the Hawks Prairie site and is likely absent in some locations. This leads to movement of reclaimed water from the shallow aquifer to the deep aquifer. The new wells also confirmed flow direction of the deep aquifer to the east.

The groundwater model was then calibrated to conditions observed from the field investigations (e.g., groundwater elevations) and the tracer test (e.g., travel times of the tracers), and used to estimate the extent of reclaimed water movement over a 100-year period from present day. An initial transient flow simulation was first used to reflect historical annual average recharge rates from 2006 to 2020 (ranging from 0 to 0.99 mgd), to characterize the extent of reclaimed water movement by 2020. A second transient simulation incorporated anticipated increases in recharge rates to reflect planned growth in LOTT’s service area. Projected annual average flow rates were increased from 0.5 mgd in 2020 to 4.2 mgd by 2120. Sensitivity analyses were also performed to evaluate the variability in the key model elements of dispersion, porosity, and recharge, the latter being explored to understand potential impacts of climate change and development upon future groundwater conditions. The modeled extent of reclaimed water movement in the shallow aquifer is depicted in Figure 4-9, wherein the color depicts the portion of groundwater at a given location that is comprised of water that originated as reclaimed water infiltrated at the Hawks Prairie site. This is characterized as a ratio shown as C/C_o (see Section 4.5 for further definition). The values of this ratio range from 0 (the white fringe, indicating essentially no presence of water infiltrated at the Hawks Prairie site) to 1 (the dark blue, indicating groundwater is comprised fully of water that was infiltrated at the Hawks Prairie site).

Figure 4-9. Modeled Extent of Reclaimed Water Movement (2020 and 2120; Shallow Aquifer)

4.5 Exposure Point Concentrations

The groundwater model was an important tool used in determining Exposure Point Concentrations (EPCs), which are the concentrations of residual chemicals at locations where people or wildlife may be exposed through contact with groundwater (e.g., through well water) or surface water (e.g., through the connectivity of groundwater with Woodland and McAllister Creeks). Multiple factors were considered when deriving EPCs. The following equation summarizes how an EPC was determined for a particular chemical for a specific amount of travel time away from the point of infiltration:

$$EPC = (C_{ochem} * C/C_o) * (1-(AF * T_{loc}))$$

Where:

C_{ochem} = the concentration of the residual chemical in reclaimed water

C/C_o = the influence of dispersion at a particular exposure point (i.e., the percent of original chemical concentration remaining after the effects of dispersion, as depicted in Figure 4-9)

AF = the calculated attenuation factor

T_{loc} = the model predicted travel time to the exposure point

The “starting point” of the EPC calculation is the reclaimed water concentration of each assessed residual chemical, which was determined based on all reclaimed water monitoring data obtained during Tasks 1 and 2. Where data were sufficient for statistical analysis, the reclaimed water concentration was calculated as the 95% upper confidence limit (UCL) of the arithmetic mean of the available data set, using U.S. EPA’s ProUCL software. Where data were not sufficient for this approach, the observed maximum reclaimed water concentration was used.

Computer modeling was then used as a key step in defining the extent to which concentrations decrease due to dispersion. Further reductions in chemical concentrations in the groundwater environment were characterized where empirical data from the tracer test and water quality monitoring strongly indicated additional attenuation beyond dispersion for a particular chemical. In these cases, an “attenuation factor” was derived that accounts for the added effects of mechanisms such as biodegradation and sorption.

The EPC calculation incorporated an attenuation factor for nine chemicals, but it was based solely on model-derived dispersion for the other chemicals evaluated. The EPCs were then used as inputs into the risk assessments conducted at part of Task 3.

4.6 Treatment Effectiveness Findings and Conclusions

Extensive hydrogeologic characterization, made possible by the installation of lysimeters and new groundwater monitoring wells at and near the Hawks Prairie site, along with a 10-month long tracer test yielded an increased understanding of subsurface conditions. Reclaimed water infiltrated in this area flows generally southwest in the shallow aquifer. The geologic unit that separates the shallow aquifer from the deep aquifer in this area has segments that are thin or absent, which allows for movement of reclaimed water into the deep aquifer, at which point it then generally flows to the east.

Most residual chemical concentrations decrease with time and distance as reclaimed water mixes with groundwater and moves away from the site. Of the 24 residual chemicals detected during all quarterly sampling events as part of the 10-month tracer test, ten exhibited “good” attenuation in groundwater, meaning they were not detected after 30 days of travel time. The remaining residual chemicals were detected at least once beyond that time of travel.

EPCs were determined for the residual chemicals of interest in the risk assessments. These values represent the concentrations of chemicals predicted to be present either now or within the 100-year future at locations where people or wildlife may come into contact with reclaimed water after it has mixed with groundwater. The EPCs for some residual chemicals are solely a function of dispersion, as the chemicals are resistant to further attenuation by biodegradation and sorption, while the EPC calculations for nine chemicals included additional attenuation due to these factors, based on empirical evidence gathered during the Study. This information provided key inputs to the Task 3 risk assessments.

5.0 Human Health Risk Assessment (Task 3.1)

A human health risk assessment (HHRA) was conducted, in accordance with U.S. EPA guidance, to characterize the potential risk to human health by residual chemicals detected in reclaimed water that is used to recharge groundwater. Before risk could be calculated, average daily doses of each chemical of interest were estimated for different hypothetically exposed populations, representing a range of exposure scenarios. Based on these dose estimates, quantitative estimates of the potential for adverse health effects to exposed populations were derived. Potential adverse effects considered in the HHRA include noncancer hazards and lifetime excess cancer risks.

5.1 Screening Level Evaluation

In an initial screening-level evaluation, concentrations of 84 residual chemicals detected in at least one water sample during Tasks 1 and 2 were “screened” to identify those that might present health risks that exceed U.S. EPA’s allowable risk range to people who contact the water. In the screening-level evaluation, maximum-detected concentrations of the chemicals in reclaimed water were compared to toxicity benchmark concentrations, termed Drinking Water Equivalent Levels (DWELs). DWELs were set equal to existing federal or state water quality standards or toxicity criteria, or derived from published toxicological data or therapeutic doses (for pharmaceuticals).

The screening-level evaluation showed that 15 chemicals were detected at least once in reclaimed water at a concentration in excess of their DWEL. Because this list included four hormones and two per- and polyfluoroalkyl substances (PFAS), all other hormones and PFAS analyzed in the Study were also selected for further evaluation in the HHRA, as were 14 additional chemicals that were detected at a maximum concentration of 10% or more (i.e., within one order of magnitude) of their DWEL. Overall, a total of 44 chemicals was selected for further evaluation in the HHRA.

5.2 Chemicals of Interest

In the next step of the risk assessment, exposure point concentrations (EPCs) were used to refine the list of chemicals of interest. People living downgradient of LOTT’s infiltration basins do not have direct contact with reclaimed water and will not have direct contact in the future. Further, chemicals in the reclaimed water that undergo subsurface transport through groundwater will be subject to several processes, including advection, dispersion, diffusion, sorption, and decay, that affect the concentration and location of each constituent, resulting in attenuation of downgradient concentrations prior to points where exposure could occur. To account for the impact of these processes on potential residual chemicals in downgradient well water or surface water, the list of chemicals considered in the HHRA was further refined by comparing estimated EPCs of each chemical to the DWELs. If the maximum-estimated EPC of a chemical was equal to or greater than 10% of the chemical’s DWEL, the chemical was retained for more detailed evaluation in the HHRA. If the chemical was never detected in monitoring, it was not included in the HHRA.

Based on these comparisons, eight chemicals of interest (COIs) were retained for further evaluation in the HHRA. These COIs are:

- 1,4-Dioxane (an industrial chemical with widespread use as a stabilizer in certain chlorinated solvents, paint strippers, greases, and waxes)
- Carbamazepine (a pharmaceutical used to treat certain types of seizures such as epilepsy, and typically classified as an anticonvulsant)
- N-Nitroso dimethylamine (NDMA) (a chemical that was formerly used in the production of rocket fuel, antioxidants, and softeners for copolymers and that is currently used for research purposes, but is also produced as a byproduct of water chlorination disinfection processes undertaken at some water treatment facilities; it also occurs in some cosmetics and other products and is produced in the human body from nitrosamines and nitrates present in foods such as smoked or cured meats and fish, dried milk and formula, and vegetables, and in beverages such as beer and whiskey)
- Perfluoro octanoic acid (PFOA), perfluoro-n-hexanoic acid (PFHxA), and perfluoropentanoic acid (PFPeA) (three members of a class of human-made compounds known as PFAS that have been used in surface coating and protectant formulations because of their unique surfactant properties, including in paper and cardboard packaging products, carpets, leather products, textiles, firefighting foams, and nonstick coatings)
- Primidone (a pharmaceutical used to treat seizure disorders and typically classified as an anticonvulsant)
- Quinoline (an industrial chemical used mainly as an intermediate in the manufacture of other products, and also as a catalyst, corrosion inhibitor, preservative for anatomical specimens, and solvent for resins and terpenes, as well as in metallurgical processes, dye manufacture, and production of polymers and agricultural chemicals).

5.3 Exposure Scenarios

In the HHRA, potential exposures to hypothetical future populations that could be exposed to COIs in tap or well water or in surface water in Woodland Creek or McAllister Creek were quantified using U.S. EPA recommended risk assessment methodologies. Several scenarios and populations were selected to represent a range of potential exposures. The scenarios and populations evaluated in the HHRA are:

- Residents (child and adult) exposed directly to potable water from domestic water supply wells via ingestion and dermal contact, and that could be exposed via inhalation of volatiles from the water into the domestic living space. For these populations, both a reasonable maximum exposure (RME) (defined as an upper bound estimate of exposure to a resident that could reasonably be expected to occur via a given exposure pathway) and a more likely exposure (MLE) (defined as an estimate of an “average” level of exposure to a resident that could reasonably be expected to occur via a given exposure pathway) are evaluated.
- Maintenance/landscape workers (adult) exposed to tap or well water via direct ingestion and dermal contact (e.g., while irrigating at a park or golf course).

- Recreators (child) exposed to tap or well water at a recreational water feature through dermal contact and incidental ingestion as well as through direct ingestion of tap water while engaging in play (e.g., at a playground or ball field).
- Recreators (child and adult) exposed to surface water in Woodland Creek or McAllister Creek through dermal contact and incidental ingestion during playing, fishing, wading, or swimming.
- Fish consumers (child and adult) who eat fish caught in Woodland Creek or McAllister Creek.

Exposures to these populations were estimated using EPCs determined in the Task 2 fate and transport modeling and exposure parameters that describe behavioral characteristics and physiological characteristics representative of the populations of interest. For most exposure parameters, characteristics descriptive of U.S. populations or U.S. EPA standardized default exposure parameters for characterizing reasonable maximum exposures were used. As appropriate, locally relevant information and/or professional judgment was also applied. Characteristics used in the calculation included factors such as quantity of water ingested, body weight, and number of years living in the home.

Potential EPCs of COIs in tap or well water were based on the maximum-estimated concentrations in the shallow and deep aquifers which, for all COIs, were estimated to occur at a location 200 feet downgradient of the discharge basins (the closest location for which concentrations were modeled). While no domestic or municipal water supply wells are currently located this close to the recharge basins, it is assumed that 200 feet represents the minimum buffer that would be required in future permitting to install a new groundwater supply well in proximity to an infiltration basin. Use of EPCs estimated at 200 feet downgradient is assumed to provide a conservative (health-protective) estimate of potential exposures to future downgradient populations.

For those chemicals estimated to infiltrate from the aquifers to points of entry into each creek, EPCs were estimated assuming that concentrations in the aquifers at points of entry are reduced by mixing with flow within each creek.

For the exposure populations and scenarios, doses in units of milligrams per kilogram body weight per day (mg/kg-d) were estimated for each pathway (ingestion and dermal) and COI using assumed exposure parameters and EPCs. For evaluation of noncarcinogenic effects, doses were averaged over one year and presented as annual average daily doses (ADDs). For evaluation of cancer risk, doses were averaged over a lifetime (assumed to be 70 years) and presented as lifetime average daily doses (LADDs). These dose estimates were then combined with chemical- and pathway-specific noncancer or cancer toxicity criteria to derive estimates of noncancer hazard and cancer risk associated with the exposures.

The impacts to calculated risks of reducing residual chemical concentrations through additional levels of advanced reclaimed water treatment were also identified.

5.4 Human Health Risk Assessment Results

The potential for noncarcinogenic health effects was evaluated using a hazard index (HI) approach. This approach assumes that for a particular exposure scenario, simultaneous exposures of a person to a chemical via several pathways is additive, and that the relative magnitude of the adverse effect associated with the total exposure to that chemical is proportional to the summed ratios of pathway-specific exposures to allowable exposures. The results of the HHRA predicted the following with regard to noncancer hazards under the current reclaimed water treatment scenario:

- Estimated upper bound noncancer HIs exceed the minimum threshold level of concern of 1.0 for only one chemical and scenario—PFPeA for the RME child resident scenario, with an estimated HI of 1.3 (or 1 if rounded to one significant figure). The RME scenario is intended to reflect a high end estimate of potential exposures. It is defined as the highest exposure that is reasonably expected to occur at a site, and is intended to estimate a conservative exposure case (i.e., well above the average case) that is still within the range of possible exposures, e.g., within approximately the 90th to 99.9th percentiles of the risk distribution for an exposure scenario.
- An HI >1 does not mean that adverse health effects are expected or will occur. In fact, if the noncancer HI is close to 1 (as is the case for the upper bound noncancer hazard estimate for the RME child resident scenario for PFPeA), adverse health effects are unlikely even if a person's exposure is at this estimated upper bound level. This is because multiple uncertainty factors are incorporated into the derived toxicity criterion (i.e., allowable daily dose) used to calculate the noncancer hazard for this chemical.
- Estimated upper bound noncancer HIs for PFPeA for the shallow and deep aquifers are nearly the same because the estimated EPCs for these aquifers are nearly the same (with the EPCs for the deep aquifer slightly lower).
- For the RME resident scenarios, estimated noncancer HIs for a child are approximately two times those for an adult. This is because HIs are determined based on an estimated annualized average daily dose and typically, the average intake of a child on a per kilogram of body weight basis is greater than that of an average adult. The estimated upper bound noncancer HI for the RME adult resident scenario is below 1.0.
- Greater than 99% of the estimated noncancer HIs for the RME child or adult resident scenarios for PFPeA are contributed by the water ingestion pathway. This pathway assumes a child drinks approximately 1 liter of water per day or an adult drinks approximately 2.6 liters of water per day, nearly every day (350 days per year) in the home. The contribution of dermal contact with water to total daily dose is <1%.
- Estimated noncancer HIs for all other chemicals and all other scenarios, including the MLE resident scenario, are below 1.0. Under the MLE resident scenarios, the rate of ingestion of tap water in the home is assumed to be approximately one-half liter per day for a child and 1.3 liters per day for an adult for 234 days per year (approximately two-thirds of a year).

- People can also be exposed to PFPeA in the diet. Estimated daily exposures for the RME resident from tap water are estimated to be comparable to exposures from the diet unrelated to potential reclaimed water sources.

The potential for cancer-related risks was evaluated by comparing estimated lifetime excess cancer risks (LECRs) to established benchmarks. With regard to predicted cancer risks under the current treatment scenario, the following was found:

- Estimated upper bound LECRs exceed the *de minimis* cancer benchmark of 1 in 1,000,000, or 10^{-6} for only one chemical and scenario—NMDA for the RME resident scenario, which has an estimated LECR of 2.9×10^{-6} (3×10^{-6} if rounded to one significant figure).
- This LECR can be interpreted as a probability that, at the upper bound of the risk estimates, 2.9 persons in one million (10^6) people could develop cancer if they are exposed to this chemical at this rate over their lifetime.
- While the upper bound LECR estimate for the RME resident scenario slightly exceeds a *de minimis* one-in-a-million LECR, it falls within the range of risks considered to be allowable by U.S. EPA and others at different sites depending on specific site characteristics (1×10^{-4} to 1×10^{-6}, or 1 in 10,000 to 1 in 1,000,000).
- Estimated upper bound LECRs for NDMA for the shallow and deep aquifers are nearly the same because the estimated EPCs for these aquifers are nearly the same (with the EPCs for the deep aquifer slightly lower). More than 99% of this estimated risk is contributed by the water ingestion pathway.
- Estimated LECRs for all other chemicals of interest and exposure scenarios, including the MLE resident scenario, are below the level of concern of 1×10^{-6}.
- Other sources of exposure to NDMA include food or beverages that contain nitrosamines, such as smoked or cured meats and fish, vegetables, dried milk or formula, and malt beverages (“exogenous” NDMA) and food that contains nitrates, such as cured meats or fish and vegetables, that can be converted to NDMA in the stomach (“endogenous” NDMA). Estimated upper bound daily exposures for the RME resident from tap water are estimated be about 1 to 3% of exposures to exogenous or endogenous NDMA from sources unrelated to potential reclaimed water sources.

With regard to potential noncancer hazards and cancer risks associated with consumption of fish from either McAllister Creek or Woodland Creek, the HHRA predicts that even at a high end fish consumption rate of 330.5 grams per day (g/d) (corresponding to the 95th percentile estimate of “total fish” consumption from the Puget Sound and elsewhere by Squaxin Tribe consumer only adults, as presented by U.S. EPA and supported by the Squaxin Tribe, or approximately 609 servings per year assuming an average 7-ounce serving size), estimated noncancer hazards and cancer risks for these scenarios are below threshold levels of concern.

A probabilistic risk assessment (PRA) was conducted for the two chemicals with upper bound hazard or risk estimates that slightly exceed risk thresholds based on the deterministic risk assessment—PFPeA and NDMA, for the RME resident scenario. The PRA results indicated that estimated HIs for PFPeA and LECRs for NDMA meet the human health protection goals set by the Florida Department of Environmental Protection and the Oregon Department of

Environmental Quality (the only two regulatory agencies with PRA-based water quality goals corresponding to specific distribution percentiles for HIs and LECRs). Moreover, even at the 99th percentile, the LECRs for NDMA are within U.S. EPA's allowable risk range (1×10^{-6} to 1×10^{-4}).

Two key sources of uncertainty in the PRA noncancer hazard and cancer risk estimates for PFPeA and NDMA are the assumed water concentrations and the applied toxicity criteria. Water concentrations applied in the PRA are point estimate values and are the same as values used in the deterministic HHRA. They are based on the modeled chemical concentration in the shallow or deep aquifers 200 feet downgradient of the basins, using the 95 percent upper confidence limit (UCL) of the arithmetic mean concentrations of these chemicals in reclaimed water as the initial concentration. For these chemicals, no biodegradation or sorption downgradient of the source was assumed to occur. Overall, these assumptions are assumed to result in conservative (health protective) estimates of potential EPCs for these chemicals. The toxicity criteria used to estimate noncancer hazards or cancer risk for these chemicals are the same as applied in the deterministic HHRA and are assumed to provide a conservative (health protective) estimate of potential hazards or risks at a given dose. Thus, even if exposures consistent with the upper bounds of the PRA output distributions were to occur, it does not mean that adverse health effects are expected or will occur.

5.5 Human Health Risk Assessment Findings and Conclusions

The key findings of the HHRA are:

- Estimated upper bound noncancer hazard indices (HIs) exceed the minimum threshold level of concern of 1.0 for only one chemical and scenario—PFPeA for the RME child resident scenario, with an estimated HI of 1.3.
- Estimated upper bound lifetime excess cancer risks (LECRs) exceed the *de minimis* cancer benchmark of 1 in 1,000,000, or 10^{-6} for only one chemical and scenario—NDMA for the RME resident scenario, which has an estimated LECR of 2.9×10^{-6}.

A probabilistic risk assessment (PRA) conducted for PFPeA and NDMA indicated that estimated HIs for PFPeA and LECRs for NDMA meet the human health protection goals set by the Florida Department of Environmental Protection and the Oregon Department of Environmental Quality (the only two regulatory agencies with PRA-based water quality goals corresponding to specific distribution percentiles for HIs and LECRs).

Two key sources of uncertainty in this analysis are the assumed water concentrations and the applied toxicity criteria. For both parameters, assumptions are conservative (health protective) in nature. Thus, even if exposures consistent with the upper bounds of the PRA output distributions were to occur, it does not mean that adverse health effects are expected or will occur.

6.0 Ecological Risk Assessment (Task 3.2)

An ecological risk assessment (ERA) was conducted to assess the potential risk posed by residual chemicals to aquatic-dependent organisms that utilize streams fed in part by groundwater influenced by reclaimed water.

The ERA was prepared in accordance with U.S. EPA guidance. Chemicals of potential ecological concern (COPECs) were initially identified through a screening-level evaluation. The list of COPECs was refined using data from the Task 2 analysis, and a final list of five COPECs was evaluated in detail in an exposure analysis that characterized potential effects and risk. The ERA found that the use of reclaimed water for groundwater recharge does not pose unacceptable risk to aquatic-dependent organisms.

6.1 Problem Formulation

The first phase of the ERA, the problem formulation, was conducted in 2019–2020. The problem formulation included a site description for the two waterbodies of interest (Woodland and McAllister Creeks), selection of receptors of concern (ROCs), development of a conceptual site model (CSM), identification of assessment and measurement endpoints, and identification of COPECs.

ROCs for Woodland and McAllister Creeks include the general aquatic community that may be exposed to residual chemicals via direct contact with surface water (e.g., aquatic plants, invertebrates, fish, and herptiles), as well as fish and aquatic-dependent wildlife that may feed in Woodland and McAllister Creeks. Belted kingfisher and northern river otter were selected as ROCs to represent piscivorous species of birds and mammals, respectively.

The CSM describes pathways through which ecological receptors may be exposed to residual chemicals and identifies assessment endpoints and risk questions to evaluate those endpoints. The most significant pathways evaluated in the ERA are direct exposure to surface water, exposure of fish from bioaccumulation of chemicals in tissue, and exposure through ingestion of fish tissue containing bioaccumulated chemicals. The protection and maintenance of aquatic communities, fish populations, and aquatic-dependent bird and mammal populations were the ecological assessment endpoints (EAEs) evaluated. Risk questions and measurement endpoints were developed for all ROCs based on the complete and significant exposure pathways for surface water and fish tissue (for addressing risk to both fish and ROCs consuming fish) identified in the CSM.

COPECs were identified by comparing the maximum concentrations of residual chemicals to conservative screening benchmarks for water. In addition, each chemical was evaluated for persistence and bioaccumulation potential based on half-lives and bioaccumulation factors, respectively. Chemicals were identified as COPECs if concentrations were greater than the screening benchmarks, or if a chemical was classified as potentially highly persistent and bioaccumulative.

6.2 Groundwater Modeling and COPEC Refinement

A groundwater fate and transport model was developed to estimate concentrations of COPECs discharging to Woodland and McAllister Creeks over the course of 100 years of reclaimed water infiltration, beginning from present day. The model output was used to refine the list of COPECs identified in the screening evaluation. For example, chemicals were removed from the list of COPECs if EPCs for both creeks were zero or if EPCs were less than the screening benchmark. Five COPECs were ultimately identified for quantitative risk evaluation: the surfactant 4-nonylphenol and four PFAS (perfluoro-1-butanesulfonic acid [PFBS], perfluoro-n-hexanoic acid [PFHxA], perfluoro octanoic acid [PFOA], and perfluoropentanoic acid [PFPeA]). 4-nonylphenol was considered a surface water COPEC because the screening benchmark for water was exceeded, while the four PFAS were classified as fish tissue and wildlife COPECs due to high persistence and bioaccumulation potential.

6.3 Exposure Analysis

For each COPEC, a creek-wide surface water EPC was calculated for each creek based on the maximum mass discharge of the chemical (based on the 100-year groundwater fate and transport model projections) and a dilution factor (to account for the dilution of groundwater with surface water). Additionally, for the fish tissue and wildlife COPECs, fish tissue EPCs and wildlife dietary doses were calculated. Fish tissue EPCs were derived from the surface water EPCs and surface water-to-biota bioaccumulation factors (BAFs), which estimate chemical uptake into tissue from direct contact with water and dietary intake. Wildlife dietary doses were calculated for belted kingfisher and river otter using the surface water and fish tissue EPCs and species-specific food and water ingestion rates and body weights.

6.4 Effects Characterization

The effects characterization establishes toxicity reference values (TRVs), which are toxicity thresholds below which adverse effects are not expected to occur. TRVs were derived, when possible, for surface water (for 4-nonylphenol) and fish tissue and wildlife dietary doses (for the four PFAS COPECs) using data from the scientific literature. A freshwater TRV for 4-nonylphenol was derived based on U.S. EPA guidelines for developing chronic ambient water quality criteria (AWQC). The AWQC approach uses a species sensitivity distribution that targets a 5^{th} percentile level of sensitivity intended to protect 95% of species in the aquatic community.

Fish tissue and wildlife TRVs were derived from toxicity data found in the scientific literature. Fish tissue TRVs for PFHxA and PFOA are based on no-observed-effect concentrations (NOECs) for zebrafish embryo survival and development. No data were available for PFBS or PFPeA. Bird and mammal dietary dose TRVs for PFBS (birds and mammals), PFHxA (mammals only), and PFOA (birds and mammals) are based on lowest-observed-adverse-effect levels (LOAELs) for survival, growth, and/or reproduction. No data were available for PFPeA.

6.5 Risk Characterization

In the risk characterization, the EPCs from the exposure analysis and the TRVs from the effects characterization were used to calculate hazard quotients (HQs). HQs are used to assess potential for adverse effects. HQs greater than or equal to one indicate that there is potential for

adverse effects on EAEs, and HQs less than one indicate that the potential for adverse effects causing risk to EAEs is negligible.

For 4-nonylphenol, HQs were calculated by dividing the surface water EPCs for Woodland and McAllister Creeks by the surface water TRV. For the four PFAS, HQs were based on fish tissue EPCs and wildlife dietary doses divided by their respective TRVs. All HQs were less than one, indicating there are no unacceptable risks associated with these chemicals at these concentrations. In cases where no data were available to derive TRVs, HQs were not calculated.

6.6 Ecological Risk Assessment Findings and Conclusions

Based on their low HQs, the potential for residual chemicals currently present in reclaimed water infiltrated into groundwater to cause risk to EAEs is negligible. Uncertainties associated with each component of the risk assessment—including COPEC selection and quantification, exposure estimation, effects estimation, and risk characterization—were evaluated and did not change the risk conclusion.

7.0 Cost Benefit Analysis (Task 4)

Using the information developed in Tasks 1-3, a cost benefit analysis was conducted to determine the costs and benefits of various levels of treatment for reclaimed water and identify other strategies to address risks related to residual chemicals. This effort involved identifying options for advanced levels of reclaimed water treatment and assessing benefits of such treatment options in terms of reduced levels of risk based on enhanced residual chemical removal from reclaimed water.

7.1 Advanced Treatment Options

The first step of the cost benefit analysis was a review of the broad range of treatment technologies that can be used to reduce residual chemicals concentrations in reclaimed water. Four treatment options were identified for further analysis. These options range from reverse osmosis (sometimes considered the “gold standard” of treatment) to no additional treatment.

- **Reverse Osmosis (RO) + Ultraviolet Light (UV) + Hydrogen Peroxide (H_2O_2)** is a combination of technologies that offers a multi-barrier system for removal of residual chemicals. RO uses pressure to force water through a membrane, leaving behind minerals, salts, and other compounds, including residual chemicals. The process requires high energy use and results in a concentrated brine that is costly and challenging to dispose of. UV and H_2O_2 break down chemicals not removed by RO. This multi-step system is effective at removing most residual chemicals from reclaimed water.
- **Ozone + Biological Activated Carbon (BAC) + Granular Activated Carbon (GAC)** is also a multi-barrier system. Ozone and BAC processes degrade many chemicals and GAC acts as a polishing step to absorb chemicals that remain. It requires proper disposal of spent carbon, which is typically less challenging than RO brine disposal. This system is effective at removing many residual chemicals from reclaimed water.
- **Granular Activated Carbon (GAC)** is a treatment technology that absorbs certain chemicals. GAC could be used as a stand-alone technology initially and be incorporated into a multi-step treatment train if warranted in the future. It is a targeted approach that addresses the two chemicals of interest identified in the HHRA, by removing PFPeA and the broader suite of PFAS chemicals, and the precursor chemicals that contribute to the formation of NDMA.
- **No advanced (i.e., no additional) treatment** is the option that would maintain the current level of treatment. Class A reclaimed water is produced at the MWRWP using membrane bioreactor technology. Microorganisms break down compounds in the water before it is filtered through a membrane system and disinfected with chlorine. Class A reclaimed water meets high water quality standards and is approved by Washington State Departments of Health and Ecology for many uses, including groundwater replenishment. With the Task 3 results indicating the risk of using this quality of water is very low, this remains a viable treatment option.

7.2 Cost Estimates

Cost estimates were prepared for each advanced treatment option, including upfront capital costs and ongoing annual system operation and maintenance (O&M). Costs were developed for two sizes of facilities: 1 and 5 mgd. The present value costs (i.e., in 2022 dollars) over a 20-year lifecycle are presented in Table 7-1.

Table 7-1. Present Value (20-Year) Costs for Advanced Treatment Options

Treatment Option	Present Value ($million)
RO Treatment – 1 mgd	$76.0
RO Treatment – 5 mgd	$218.7
Ozone-BAC-GAC Treatment – 1 mgd	$18.5
Ozone-BAC-GAC Treatment – 5 mgd	$48.3
GAC Treatment – 1 mgd	$5.8
GAC Treatment – 5 mgd	$19.2

7.3 Cost Benefit Analysis Results

The cost benefit analysis results are presented as a quantitative comparison of costs and benefits (in the form of risk reduction) associated with the identified treatment options. In this analysis, the benefit of applying additional levels of treatment to LOTT's reclaimed water can be evaluated as the associated reduction in level of risk. Table 7-2 presents a summary of this information, focused on the use of reclaimed water for groundwater recharge. The No Advanced Treatment option reflects continued generation and use of Class A reclaimed water via LOTT's current treatment systems.

Table 7-2. Risk Reduction Benefit for Treatment Options

Treatment Option	Highest Risk Level [a]	
	PFPeA	NDMA
No Advanced Treatment	1.3	2.9×10^{-6}
GAC	0.065	2.9×10^{-6} (Max; NDMA removal) 2.8×10^{-7} (Min.; NDMA precursor removal)
Ozone-BAC-GAC	0.065 (Max.) 0.013 (Min.)	8.4×10^{-7} (Max.) 1.4×10^{-7} (Min.)
RO-Based	0.0	1.1×10^{-6} (Max.) 5.8×10^{-8} (Min.)

Notes:

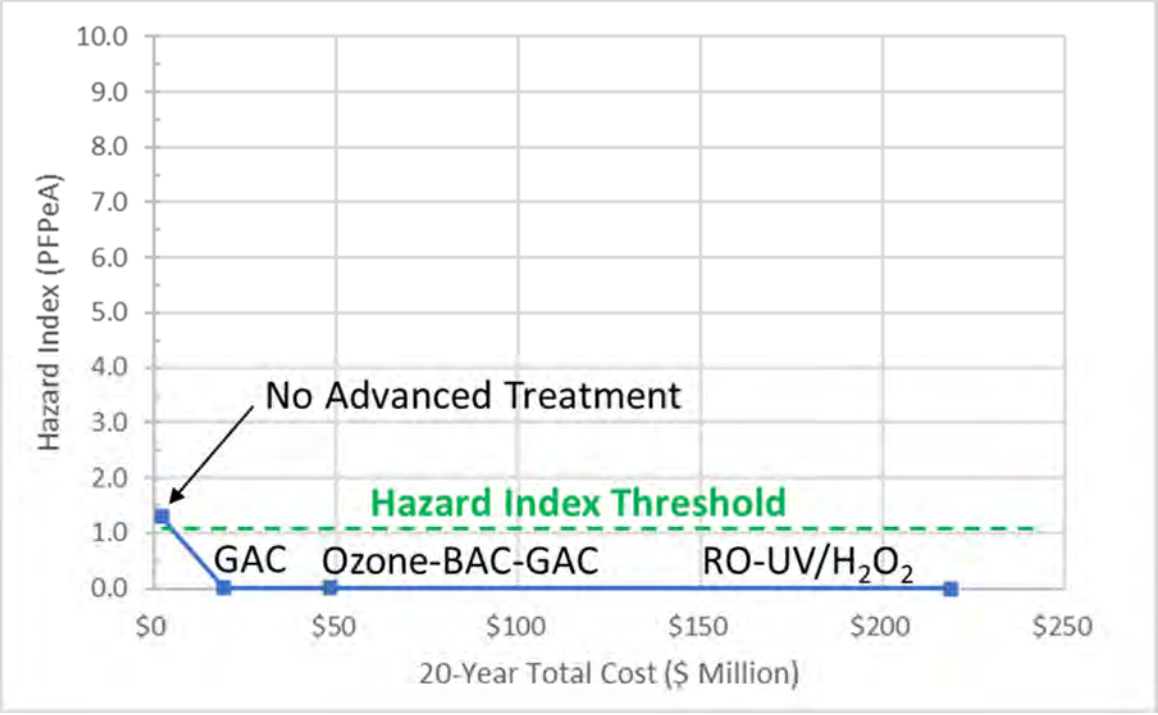
a. As presented in the HHRA, based on the RME child resident scenario. Depicted as a range (maximum and minimum risk) in cases where reviewed treatment efficacy is characterized by a range. Specific notes:

- PFPeA. Non-cancer risk level presented as a Hazard Index (HI). Minimum threshold of concern is HI = 1.
- NDMA. Cancer risk level presented as Lifetime Excess Cancer Risk (LECR). *De minimis* cancer benchmark is 1×10^{6}.

This information is also summarized on Figure 7-1 (for PFPeA)[1] and Figure 7-2 (for NDMA), where the 20-year present value costs for the 5 mgd treatment facility size are plotted against the HHRA results for each treatment option.

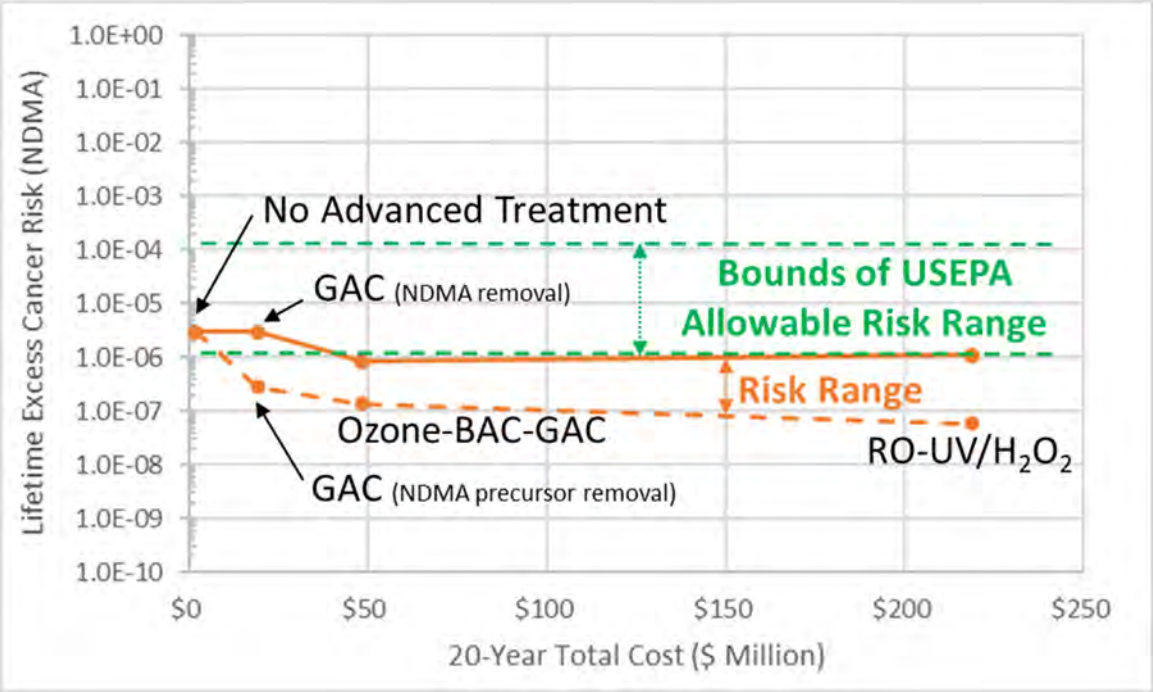
The No Advanced Treatment option may be considered a viable option, given the low level of risk identified in the risk assessments. All options of providing advanced levels of treatment reduce the highest risk levels to below minimum thresholds of concern. While the RO-based treatment train has the potential to result in the greatest risk reduction, it also carries the greatest cost. The GAC and Ozone-BAC-GAC options provide the same risk reduction levels for PFPeA, with the GAC-only option having considerably less cost. The impact of the GAC-only option upon NDMA-related risk is a function of whether NDMA in reclaimed water comes from NDMA that is present in influent wastewater or if it is formed during the disinfection stage of treatment. If it is predominantly the latter, GAC treatment can be effective at removing NDMA precursors, thereby preventing NDMA formation in reclaimed water. In this case, the NDMA-related risk is reduced similar to the Ozone-BAC-GAC treatment option. If NDMA is already present in influent wastewater, no removal by GAC is assumed and the risk level is considered unchanged from the No Advanced Treatment option. Therefore, further characterization of NDMA throughout LOTT's treatment processes is warranted if the GAC-only option is pursued.

Figure 7-1. PFPeA Cost/Risk Comparison



[1] No risk ranges are shown in Figure 7-1. As depicted in Table 7-2, a risk range is only shown for the Ozone-BAC-GAC option in relation to PFPeA removal. The range shown in Table 7-2 is too small to be clearly depicted at the scale presented in Figure 7-1.

Figure 7-2. NDMA Cost/Risk Comparison



7.4 Cost Benefit Analysis Findings and Conclusions

Four treatment options were evaluated to understand the costs and benefits (regarding residual chemical removal efficacy) of implementing various levels of treatment. These options were:

- Reverse Osmosis (RO) + Ultraviolet Light (UV) + Hydrogen Peroxide (H_2O_2)
- Ozone + Biological Activated Carbon (BAC) + Granular Activated Carbon (GAC)
- Granular Activated Carbon (GAC)
- No Additional Treatment (i.e., no advanced treatment employed beyond current levels of treatment)

Twenty-year present value costs, including capital and operational/maintenance costs, were developed for the various options. Costs for a 5 mgd capacity treatment facility range from $0 for the No Advanced Treatment option to $218.7 million for the RO-based treatment train.

These costs were then compared against the amount of risk reduction associated with each option. The No Advanced Treatment option may be considered a viable option, given the low level of risk identified in the risk assessments. All options of providing advanced levels of treatment have the potential to reduce the highest risk levels to below minimum thresholds of concern. While the RO-based treatment train results in the greatest risk reduction, it also carries the greatest cost. The GAC and Ozone-BAC-GAC options provide the same risk reduction levels for PFPeA, with the GAC-only option having considerably less cost. If the GAC-only treatment option is of interest, further characterization of NDMA throughout LOTT's treatment

processes is warranted, as its efficacy on reducing NDMA formation potential depends on if NDMA is present in influent wastewater or is created during treatment.

8.0 Summary

This extensive research effort adds to the overall understanding of potential risk as it pertains to use of reclaimed water for groundwater replenishment. It also broadens the information base regarding infiltration projects in temperate climates, as much prior research has been conducted in warm, arid regions of the U.S. Overall, study findings indicate the risk to human and ecological health from residual chemicals in reclaimed water used for infiltration is low. The Study's independent Peer Review Panel indicated:

- The risk assessments were well designed and protective of human and ecological health.
- Under current conditions, the potential risks associated with groundwater recharge are low and the water is safe.

This research effort was a point-in-time study. While it included modeling conditions 100 years into the future, analyses were based on data collected during the study period on or near the Hawks Prairie site. For these reasons, Study conclusions should be viewed as applicable to current conditions and specific to the Hawks Prairie property. Many factors can, and likely will, affect conditions in the future, including:

- Consumer products are under constant development and industrial products and practices are adjusted over time as well. As a result, the types and number of chemicals that make their way into the wastewater system will change in the future. New or different chemicals may enter the system; others may be phased out. As an example, Washington State recently passed legislation that sets an ambitious timeline for phasing out use of PFAS chemicals in consumer products.
- Research into potential health effects of residual chemicals will continue over time, and this may change the understanding of potential risk. Following the completion of the risk assessment associated with this Study, the U.S. EPA released new lifetime health advisory levels for four PFAS compounds in drinking water. While they are not considered legal federal standards and are subject to change as new information becomes available, they will likely lead to the development of new, enforceable Maximum Contaminant Levels (MCLs) for these compounds.
- Regulations are expected to change. State and federal regulations affecting PFAS chemicals, such as that mentioned above, are anticipated soon.
- Community expectations may lead to reconsideration of next steps, potentially including identification of different needs for the use of reclaimed water.
- If additional recharge sites are developed in the future, site-specific conditions and the latest research about residual chemicals will need to be considered.

The study effort addressed many questions regarding residual chemicals in reclaimed water, but some questions remain unanswered. Although the study was designed using multiple layers of health-protective assumptions to err on the side of caution, there are some uncertainties about findings. Analyses focused on a subset of residual chemicals considered representative and indicative of the many chemicals currently in use and likely to enter the wastewater system, but it is possible there are chemicals in the system not yet identified or understood. Potential

cumulative effects from combinations of various chemicals are not well understood. Information about other sources of residual chemicals, such as septic systems and stormwater, is limited.

8.1 Steps Beyond the Study

Study findings did not point to an immediate need to change current practices or level of treatment. However, treatment technologies capable of further reducing residual chemicals in reclaimed water were identified. This information can serve as a foundation for further consideration of treatment levels in response to new information and regulations.

In the near-term, some level of continued monitoring is recommended to fill data gaps and refine understanding of residual chemicals of interest.

- Continued monitoring of NDMA, NDMA precursors, PFPeA, and the broader suite of PFAS chemicals is recommended. This would provide a more robust data set to resolve uncertainty regarding NDMA, which was not detected consistently in reclaimed water or groundwater samples. It is also unclear if NDMA is entering the wastewater influent or is formed from precursors during the treatment process. Understanding the source of NDMA would in turn inform which treatment technologies could effectively reduce the chemical in reclaimed water, if it is determined that advanced treatment is necessary. Data about PFAS chemicals could provide a head start for adapting to anticipated new regulations.
- Sampling efforts to pinpoint sources of these chemicals is also recommended. This information could shed light on effective source control efforts to reduce chemical inputs into the wastewater system. Comparison of residential versus commercial/industrial effluent and sampling of groundwater, surface water, and septic effluent in areas influenced by reclaimed water infiltration and areas where reclaimed water is not used for that purpose could refine understanding of potential sources.

Conditions are bound to change. It will be important for LOTT to keep abreast of industry research, changing regulations, and the chemical landscape to gather new information as it becomes available. Revisiting the Study may be necessary in the future to reassess potential risk and study conclusions, in light of changing conditions and community expectations. Other specific longer-term actions that LOTT may consider to address risks related to residual chemicals are:

- Continued outreach and education for the public and policy makers, aimed at: 1) enhancing awareness of the costs and benefits of various water management approaches; 2) increasing the understanding of risk levels and risk management; and 3) reducing inputs of residual chemicals into the wastewater system.
- Targeted pretreatment of specific sources that contribute a higher proportion of residual chemicals to the wastewater system. At this time, no such sources are known, but if further analysis identifies them, localized advanced treatment of such waste streams could be more cost-effective than applying advanced treatment to the full quantity of reclaimed water produced at a LOTT facility.
- Support of broader industry efforts to regulate the sources of residual chemicals to reduce their inputs into the wastewater system.

- Modifying plans for future groundwater recharge. For example, LOTT could reduce or cease the use of reclaimed water for groundwater recharge purposes. Other uses, such as irrigation, could then be increased. However, it must be recognized that it is highly unlikely other uses of reclaimed water could utilize the full volume of water currently used for groundwater recharge, especially during winter months. The impacts of redirecting this water to other points of final disposition (i.e., to marine water discharge) would need to be fully considered, including its relation to evolving Puget Sound water quality management objectives and associated treated wastewater discharge constraints.

8.2 Acknowledgements

LOTT and the Study team are grateful to the many staff members, consultants, technical experts, elected officials, and community members who contributed their insights and knowledge to this major research effort. Over the course of the study, membership in the various advisory committees has changed; participants have come and gone, but many have devoted their time and expertise to the Study for the full 10-year time span. Thank you to everyone who played a role in this important effort to ensure our wastewater management practices are appropriate and responsible.

Appendix A Study Document Inventory

LOTT Reclaimed Water Infiltration Study

Study Document Inventory

1. Background Materials (2013)

a. Case Study Summary. Phase 1 (Technical Data Review). Technical Memorandum. HDR. July 16, 2013. *Case studies for six different projects across the country that involve infiltrating reclaimed water into groundwater*.

b. "State of the Science". Phase 1 (Technical Data Review). Technical Memorandum. HDR. May 31, 2013. *Summary of the State of the Science, based on a review of existing scientific research regarding study topics*.

2. Early Public Involvement (2013-2014)

a. Public Opinion Research – Structured Interviews: Summary Report. Katz. May 8, 2013. *Summary of in-depth interviews with 53 stakeholders in early 2013 to gauge awareness and perceptions about water, wastewater, reclaimed water, groundwater recharge, and related issues*.

b. Focus Group Summary Report. The Athena Group. October 7, 2013. *Summary of three citizen focus groups conducted in the fall of 2013 to learn how best to communicate about the study and the technical topics involved*.

c. Public Involvement Plan. Katz. June 20, 2013. *A plan outlining the approach to public involvement, which will be adjusted as the study progresses to effectively engage the public, gather input and feedback, and encourage community dialogue*.

d. Telephone Survey of Residents: Report on Findings. EMC Research. May 2013. *Summary of a phone survey conducted in early 2013 of 400 residents to gain an understanding of public awareness, knowledge, interest, and perceptions regarding water, wastewater, reclaimed water, groundwater recharge, and related issues*.

3. Study Planning and Scoping (2014)

a. Phase III (Study Implementation) Scope of Services. HDR. July 31, 2014. *Description of work associated with the implementation phase of the study*.

b. Independent Advisory Panel – Final Report of the February 18-19, 2014 Meeting (Panel Report 1). NWRI. August 11, 2014. *Final report from the Peer Review Panel's review of the study design and draft Phase 3 scope of work*.

c. Study Team Response to NWRI August 11, 2014 Final Report. *Responses to the Peer Review Panel Report 1, which includes comments and recommendations made by Peer Review Panel regarding study design and draft scope*.

4. Task 1 (Water Quality Characterization) Technical Documents (2014-2017)

a. Startup Water Quality Monitoring Report (Hawks Prairie Reclaimed Water Ponds and Recharge Basins). HDR. November 20, 2014. *Results of water quality sampling for residual chemicals and other parameters in reclaimed water and groundwater at LOTT's Hawks Prairie property, to characterize initial conditions during startup of the recharge basins after a period of non-use*.

b. Work Plan: Groundwater Quality Characterization (Task 1.1). HDR. February 6, 2015. *Description of the approach and methods for groundwater quality monitoring*.

c. Work Plan: Surface Water Quality Characterization (Task 1.2). HDR. July 6, 2015. *Description of the approach and methods for surface water quality monitoring*.

d. Work Plan: Wastewater and Reclaimed Water Quality Characterization (Task 1.3). HDR. January 27, 2015. *Description of the approach and methods for wastewater and reclaimed water quality monitoring*.

e. Groundwater Quality Characterization (Task 1.1). Technical Memorandum. HDR. February 7, 2017. *Results of water quality sampling for residual chemicals and other parameters in groundwater in the two study areas – the Hawks Prairie Study Area, an area influenced by reclaimed water infiltration, and the Tumwater Study Area, an area not influenced by reclaimed water infiltration*.

f. Surface Water Quality Characterization (Task 1.2). Technical Memorandum. HDR. February 7, 2017. *Results of water quality sampling for residual chemicals and other parameters in surface water in the Hawks Prairie and Tumwater study areas*.

g. Wastewater and Reclaimed Water Quality Characterization (Task 1.3). Technical Memorandum. HDR. February 7, 2017. *Results of water quality sampling for residual chemicals and other parameters in wastewater and reclaimed water at the Budd Inlet Treatment Plant, the Budd Inlet Reclaimed Water Plant, and the Martin Way Reclaimed Water Plant*.

5. Task 2 (Treatment Effectiveness Evaluation) Technical Documents (2018-2021)

a. Work Plan: On-Site Wells and Lysimeter Installation (Task 2.1.1.A) and Off-Site Monitoring Wells (Task 2.1.2.C) – Hawks Prairie Area. HDR. April 25, 2017. *Description of the approach and methods for installation of wells and lysimeters to be used for hydrogeologic characterization*.

b. Hydrogeologic Characterization Report (On-Site Wells and Lysimeter Installation and Off-Site Monitoring Wells – Hawks Prairie Area). HDR. March 26, 2018. *Description of the hydrogeologic field investigations and results*.

c. Work Plan: Tracer Testing and Water Quality Monitoring of Treatment Effectiveness. HDR. January 5, 2018. *Description of the approach and methods for the tracer testing and water quality monitoring of treatment effectiveness.*

d. Independent Advisory Panel – Final Report of the November 17, 2017 Meeting (Panel Report 2). NWRI. January 12, 2018. *Final report from the Peer Review Panel's review of the Hydrogeologic Characterization Report and the Tracer Testing and Water Quality Monitoring of Treatment Effectiveness Work Plan*.

e. Study Team Response to NWRI January 12, 2018 Final Report. *Responses to comments and recommendations made by the Peer Review Panel regarding the Hydrogeologic Characterization Report and the Tracer Testing and Water Quality Monitoring of Treatment Effectiveness Work Plan*.

f. Tracer Test and Water Quality Monitoring (Task 2.1.3). Report. HDR. October 30, 2019. *Results from the monitoring of groundwater wells for tracer and water quality parameters*.

g. Work Plan: Groundwater Modeling Predictive Simulations (Task 2.1.4 continued) and Residual Chemical Fate and Transport (Task 2.1.5). HDR. February 20, 2020. *The work plan for how the hydrogeologic model will be used to predict flow velocity, flow path, percent reclaimed water, and residual chemical concentration at potential points of exposure. These concentrations will be used in the human health and ecological risk assessments*.

h. Steady-State Groundwater Model Development and Calibration (Task 2.1.4). Technical Memorandum. HDR. October 22, 2021. *A technical memorandum on the development, calibration approach, and description of the groundwater model*.

i. Residual Chemical Fate and Transport Analysis (Task 2.1.5). Technical Memorandum. HDR. October 14, 2021. *Results from the hydrogeologic model predicting estimated residual chemical concentrations to downstream wells and creeks at current and future reclaimed water infiltration rates*.

6. Task 3 (Risk Assessment) Technical Documents (2020-2022)

a. Screening-Level Evaluation for the Human Health Risk Assessment. Intertox. May 29, 2020. *Results from a human health screening evaluation of chemicals found in reclaimed water, to be used to inform the subsequent Human Health Risk Assessment*.

b. Screening-Level Evaluation for the Ecological Risk Assessment (Problem Formulation Step of the Assessment Process. Windward Environmental. May 28, 2020. *Results from an ecological screening evaluation of chemicals found in reclaimed water, to be used to inform the subsequent Ecological Risk Assessment*.

c. Final Human Health Risk Assessment Scope of Work. Intertox. January 26, 2021. *Work plan that describes the steps that will be taken in the human health risk assessment*.

d. Final Ecological Risk Assessment Scope of Work. Windward Environmental. February 20, 2020. *Work plan that describes the steps that will be taken in the ecological risk assessment*.

e. Human Health Risk Assessment. Intertox. June 20, 2022. *Human health risk assessment for infiltration of reclaimed water into groundwater*.

f. Ecological Risk Assessment. Windward Environmental. June 20, 2022. *Ecological risk assessment for infiltration of reclaimed water into groundwater*.

7. Task 4 (Cost Benefit Analysis) Technical Documents (2022)

a. Cost-Benefit Analysis (Task 4). Technical Memorandum. HDR. June 22, 2022. *Summary of the methodology and results of a cost benefit analysis of reclaimed water treatment options and identification of other potential actions to address residual chemicals in reclaimed water*.

8. Tasks 2-4 Review Documents (2019-2022)

a. Study Team Response to NWRI October 23, 2019 Final Report (Panel Report 3). *Responses to comments and recommendations from the Peer Review Panel regarding the Tracer Test and Water Quality Monitoring Report, and the screening evaluations for the human health and ecological risk assessments*.

b. NWRI Subcommittee Comments on the Human Risk Assessment and Ecological Risk Assessment Scopes of Work. Memorandum. NWRI. May 18, 2020. *An evaluation of the work plans for human and ecological health risk assessment by a subcommittee of the Peer Review Panel*.

c. Study Team Response to NWRI September 3, 2021 Final Report (Panel Report 4). *Responses to comments and recommendations from the Peer Review Panel regarding the drafts of the Residual Chemical Fate and Transport Analysis Technical Memorandum, Human Health Risk Assessment, and Ecological Risk Assessment*.

d. Study Team Response to NWRI February 16, 2022 Final Report (Panel Report 5). *Responses to comments and recommendations from the Peer Review Panel regarding the draft of the Human Health Risk Assessment*.

e. Study Team Response to NWRI April 26, 2022 Memorandum. *Responses to additional comments and recommendations from the Peer Review Panel regarding the draft of the Human Health Risk Assessment*.

f. Study Team Response to NWRI June 15, 2022 Final Report (Panel Report 6). *Responses to comments and recommendations from the Peer Review Panel regarding the draft final of the Human Health Risk Assessment and the preliminary cost-benefit analysis*.

g. Study Team Response to NWRI July 6, 2022 Final Report (Panel Report 7). *Responses to comments and recommendations from the Peer Review Panel regarding the draft final cost-benefit analysis and preliminary Project Summary report*.

9. Project Summary Report (2022)

a. Project Summary Report. HDR. (pending). *Summary of the technical elements of the Study*.

10. Public Engagement (2022)

a. Public Communications Plan (pending). *Summary of the public outreach and involvement activities implemented over the course of the study effort.*

b. Community Advisory Group Phase 1, 2, and 3 Final Reports (pending). *Compilations of meeting minutes for each phase of the study.*

Appendix B – Hydrogeologic Report

Coho Water Resources
Integrated Water Resource Management

DRAFT

Technical Memorandum

Date: May 22, 2023

Coho Ref.: OLS-01

To: Peter Tuck, PE, Olson Engineering Inc.

From: Chris Pitre & Sherry Wilhelm

Re: **Quiemuth Village Mixed Use Project – Assessment of On-Site Groundwater Supply & Recharge of Reclaimed Water**

Olson Engineering Inc. (Olson) is supporting Acorn Environmental (Acorn) in evaluating the Nisqually Indian Tribe's (the Tribe) proposed Quiemuth Village Mixed Use Project (Project; Figures 1 and 2). The project site is located on approximately 174 acres in the northern half of the City of Lacey, Washington. The land is adjacent to additional tribally owned property which is the subject of a separate proposal for the Quiemuth Casino-Resort Project.

Olson retained Coho Water Resources, LLC (Coho) to assess the technical feasibility of:

- Developing an on-site groundwater supply for the project.
- Recharging treated wastewater ("reclaimed water") from the project to groundwater.

This assessment also touches on the cumulative needs and impacts if both the Quiemuth Village Mixed Use Project and the Quiemuth Casino-Resort Project are developed.

This technical memorandum provides our findings in the following sections:

1. Hydrogeologic setting
2. Groundwater supply:
   - Quantity
   - Quality
   - Potential impacts
3. Recharge of reclaimed water
4. Summary

GEOLOGIC UNITS (from youngest to oldest)			
Qgo	Qvr		Quaternary; glacial outwash; Vashon recessional outwash. **Aquifer**
Qgt	Qvt		Quaternary; glacial till; Vashon till. **Aquitard**
Qga	Qva		Quaternary; glacial advance outwash; Vashon. **Aquifer**
Qpf	Qk	Qf	Quaternary; pre-Fraser; Kitsap; fine-grained. **Aquitard**
Qpg	Qc		Quaternary; pre-Vashon; coarse-grained, sea-level. **Aquifer**
TQu			Tertiary/Quaternary undifferentiated sedimentary deposits. **Aquifers and aquitards**

ACRONYMS	
afy	acre-feet per year; a typical water right/use parameter
cfs	cubic feet per second
C_s	Well specific capacity
CWA	Clean Water Alliance
DOH	(Washington) Department of Health
DOT	(Washington) Department of Transportation
ft amsl	feet above mean sea level
ft bgs	feet below ground surface
ft^2/d	feet squared per day; a flow rate
gpd	gallons per day
gpm	gallons per minute
gpd/ft	gallons per day per foot
gpm/ft	gallons per minute per foot
LOTT	Lacey, Olympia, Tumwater and Thurston County
MCL	Maximum Contaminant Limit; a typical federal drinking
MW	Monitoring well
r & r_o	Radius and radius at which drawdown is zero
RWIS	Reclaimed Water Infiltration Study
Q	Flow
Qa	Annual quantity, a water right parameter
Qi	Instantaneous quantity, a water right parameter
S	Aquifer Storativity
t	time
T	Aquifer Transmissivity
TRS	Township-Range-Section
WAC	Washington Administrative Code
WGS	Washington (State) Geologic Survey, a division of the Washington Department of Natural Resources
WSDOT	Washington State Department of Transportation

1. HYDROGEOLOGIC SETTING

The geologic and hydrogeologic conditions of the project location determine the feasibility of establishing an on-site ground water supply and of recharging reclaimed water to the ground. This section summarizes existing information on these conditions and relies upon the following principal sources of information:

- Logan and others (2003): A surficial geology map of the area (1:24,000 scale) prepared by the Washington Geologic Survey (WGS).
- Mathieu (2008): A hydrogeologic report characterizing the Hawks Prairie peninsula prepared for the City of Lacey. The proposed Quiemuth development is located within the southern end of the study area.
- HDR (2018): A hydrogeologic report focused on the area around the LOTT Hawks Prairie Reclaimed Water Ponds and Recharge Basins (LOTT Hawks Prairie facility), located approximately one-third mile to the northwest of the proposed Quiemuth Village Mixed Use Project (Figure 2). Part of the LOTT-Clean Water Alliance's Reclaimed Water Infiltration Study (LOTT CWA RWIS).
- HDR (2021): A report on the development and calibration of a steady-state groundwater flow model of surface infiltration of reclaimed water at the LOTT Hawks Prairie facility. Part of the LOTT CWA RWIS.
- Rector (2021): City of Lacey Wellhead Protection Plan, 2021 Update.
- Jacobe and Trisler (2022): Drilling logs of geotechnical borings and monitoring wells.
- Washington Department of Ecology's (Ecology) well logs from the on-line well log database (selected logs included in Attachment A).

The project site is located on an upland between the Nisqually River Valley to the east and the Deschutes River Valley and Budd Inlet to the west (Figure 1). The site lies within the Woodland Creek watershed (Figure 2). The upland generally slopes to the west, and the site elevation ranges from roughly 190 to 250 feet above mean sea level (ft amsl).

The stratigraphy of the project site is presented in Table 1 and Figure 4. Two map symbol conventions are presented in Table 1: the convention currently used by the Washington Geological Survey (e.g., Logan and others, 2003) and an older convention used by Mathieu (2008). The two conventions are used interchangeably in this report.

Table 1: Hydrostratigraphy in Vicinity of the Project Site
(from surface to depth)

Stratum	Map Symbol	Characteristics	Thickness feet	Approx. Water Level ft amsl	Approx. Depth to Water ft bgs
Recessional Outwash	Qgo / Qvr	Limited presence as an outlier in the west end of the project site, and probably thin. Sand. Typically contains perched water table above the underlying till.	HDR ~0 – 100; Rector 0-40	~200 ft amsl	<20 ft bgs
Till	Qgt / Qvt	Covers most of the project site. Clayey sand and gravel. Low permeability aquitard.	HDR ~0 -50; Rector 20-60	Not an aquifer.	
Advance Outwash	Qga / Qva	Sand-and-gravel aquifer. Continuously present under the project site.	HDR 30-100; Rector 10-65	80–100 ft amsl	120 ft bgs
Fine-grained non-glacial sediments	Qpf (Qk) / Qf	Fine materials (e.g., silt). Aquitard.	HDR 0-150; Rector/Golder 30-130	Not an aquifer.	
Pre-Vashon Gravel / Sea Level Aquifer *	Qpg / Qc	Aquifer.	HDR 70 – 150; Rector Qpg 15-70	60–90 ft amsl	130 ft bgs
Tertiary and Quaternary undifferentiated sediments *	Qpg / TQu	Not well-characterized. Glacial & non-glacial deposits. Contains aquifer and aquitard zones.	HDR > 200; Rector TQu no estimate	50-70 ft amsl	150 ft bgs

Descriptions and thicknesses compiled from HDR (2018) cross-sections near the project site and Rector's (2021) more general descriptions of subsurface geology in Lacey. Map symbols per Logan and others (2003) / Mathieu (2008).
* Undifferentiated sediments may include Quaternary Pre-Vashon Gravel (Qpg) and older Tertiary Undifferentiated (TQu) deposits.
Water level elevations from contours created from observed water levels in area surrounding project site (HDR, 2021; Figures 8a-c). Water level depths below ground surface taken from average project site elevation of 210 ft amsl and same contours over the footprint of project site.
ft bgs = feet below ground surface
ft amsl = feet above mean sea level

The surficial geology is primarily Vashon Till (Qgt/Qvt) with a small outlier of Vashon recessional outwash (Qgo/Qvr) in the west end of the project site (Figure 3). The till is reported to be on the order of 100 feet thick near the eastern end of the project site (Mathieu, 2008) and is absent to the northeast of the project site in the vicinity of the LOTT Hawks Prairie facility (HDR, 2018), which contradicts the coarse scale geological mapping shown in Figure 3. Interpretations of the extents and presence of till vary among different authors.

The best representation of the stratigraphy near the project site comes from a HDR monitoring well (MW-21) drilled on the northeast side of the project site to a depth of 310 feet below ground surface (bgs; Table 2; Figure 3; HDR, 2018). This well encountered the following stratigraphy and water levels while drilling (well log included in Attachment A):

Table 2: Stratigraphy and groundwater observations in MW-21.

Depth (ft bgs)	**Elevation** (ft amsl)	**Description**	**Observed water level**
0-10	216 to 206	Recessional outwash (Qvr)	Dry.
10-30	206 to 186	Till (Qgt)	Dry and moist layers, no free water.
30-110	186 to 106	Qva (Qga) aquifer	Perched water observed at 66’ bgs.
110-164	106 to 52	Qf	Depth to water at 140’ bgs was 135’ bgs.
164-310	52 to -94	Qc (Qpg) aquifer	Depth to water at 240’ bgs was 159’ bgs.

Shallower borings and wells installed nearby, all less than 100’ deep, show the top of the Qva at 70-90 ft bgs and unsaturated conditions in most of the unit (Terra MWs 1-3 and WSDOT borings 7p, 8p, and 9p in Appendix C of Jacobe and Trisler, 2022). Borings along the south edge of the site encountered very thin layers of Qvr at surface or no Qvr

(WSDOT borings H-11-17, H-12-17, and H-13-17 in Appendix C of Jacobe and Trisler, 2022).

HDR (2021) maps the groundwater table in the Qva aquifer as flowing to the southwest across the LOTT Hawks Prairie facility (Figure 5), which is consistent with drainage of the shallow unconfined groundwater to Woodland Creek. Further to the east the Qva flows to the east and Puget Sound. The LOTT Hawks Prairie facility is mostly underlain by glacial outwash (HDR, 2018). Extrapolation of that water table pattern to the Quiemuth Village site is tenuous because the project site is a local topographic rise underlain by till, which is absent at the LOTT Hawks Prairie facility and surrounding area.

In MW-21 the depth to groundwater increased between the Qva aquifer and the Qc aquifer, which is consistent with a recharge area (i.e., a downward hydraulic gradient). Likewise, HDR (2021) measured downward gradients from Qva to Qc in three pairs of monitoring wells at the LOTT Hawks Prairie facility.

Measurements in the Qc aquifer indicate more complex groundwater flows. South of the project site, flow to northeast, but measurements for the LOTT CWA RWIS indicate more radial flow to north, east, and south locally. Based on well logs and the results of a tracer test, the RWIS study concludes that the Qc aquifer is connected to the overlying Qga aquifer due to a leaky or discontinuous Qf layer in the area west of the closed landfill, leading to groundwater flow outward from the location of this connection (HDR, 2021).

For the TQu aquifer, groundwater level measurements and a groundwater model constructed by HDR (2021) covering the area around the LOTT Hawks Prairie facility indicate flow to the north and northeast and discharge at depth to Puget Sound.

2. ON-SITE GROUNDWATER SUPPLY

The feasibility of providing an on-site water supply for this project depends upon the ability of the underlying aquifers to supply sufficient quantity and quality of water. Olson (2023) provided an estimated maximum water demand for the project of 1,002,144 gallons per day (gpd) or 696 gallons per minute (gpm; Table 3). This quantity is the highest estimated demand among the two alternative development scenarios for the project. Typical water

system operations for groundwater supplies limit pumping of a well to 18 hours a day to "relax" the well and aquifer, relying upon operational infrastructure storage and/or other wells to meet demand in the remaining 6 hours of the day. For this analysis, the maximum daily demand provided for the project is increased by 33% (24 hrs/18 hrs), resulting in an equivalent maximum desired pumping rate of 928 gpm (Table 3).

Table 3: Maximum desired pumping rate based on water supply demand.

Parameter	Source	Gallons per day (gpd)	Gallons per minute (gpm)
Average Daily Demand	Olson (2023), Table 2.1.5A	493,667	343
Maximum Daily Demand [a]	Average x 2.03	1,002,144	696
Maximum Pumping Rate (pumps operated 18 hr/day)	Maximum Daily Demand x 1.33		**928**

[a] Average daily demand times peaking factor of 2.03 for commercial facilities (Olson, 2022).

The following aspects of potential groundwater supply were evaluated:

- Water supply adequacy for the project
- Prospects for obtaining a water right, including:
  - Potential impacts of withdrawal on local streams
  - Potential impacts of withdrawal on existing groundwater appropriations in the vicinity of the project
- Suitability of groundwater quality for use as water supply:
  - Background water quality
  - Potential sources of groundwater contamination

In addition to the sources cited at the beginning of Section 1, these sources of information were consulted in relation to potential groundwater supply:

- Approved water rights as reported by Ecology's Water Rights Search database (Ecology, 2020).
- A search of a suite of databases reporting nearby sites of known or potential contamination (EDR, 2022).

2.1. Physical Groundwater Availability

Three principal aquifers in the vicinity of the project site are candidates for development of an on-site groundwater supply. From surface to depth, these aquifers are (Figure 4):

1. Vashon Advance Outwash (Qga/Qva)
2. "Sea Level Aquifer" (Qpg/Qc)
3. Permeable strata within older undifferentiated deposits (Qpg/TQu)

The City of Lacey relies on multiple wells in each of these aquifers for its water supply (Murraysmith, 2022, p. 2-7). The city-owned wells closest to the Quiemuth project site pump from the Qpg/Qc and TQu aquifers. The surficial Recessional Outwash unit (Qgo/Qvr) is not a practical source for water supply for this project because it has a thin saturated thickness, and it is shallow and susceptible to contamination. Estimated aquifer properties are listed in Table 4.

An aquifer's productivity is linearly correlated with its transmissivity (T). Aquifer transmissivity values greater than 10,000 gpd/ft are desirable for the pumping rates required for the Quiemuth project, and previous estimates suggest that the T of the Qga, Qc, and TQu aquifers are all above this threshold (Table 4; Mathieu, 2008; HDR, 2018; HDR, 2021).

Table 4: Estimated aquifer properties.

Aquifer	Transmissivity (T)		Storativity (S)
	(gpd/ft)	ft^2/d	
Qga [a]	40,000	5,300	0.0031
Qc [b]	14,000	1,900	0.002
TQu [c]	33,000	4,400	0.0004

[a] Transmissivity and storativity from multi-well pumping tests in LOTT Hawks Prairie monitoring wells (Tables 4-5 and 4-6 *in* HDR, 2018).

[b] Transmissivity from pumping data reported on the log for the City of Lacey's Betti well (in Attachment A). Storativity from Landau (2008) as reported in Table 5a, HDR (2018).

[c] Transmissivity and storativity from Mathieu (2008).

To further characterize aquifer productivity, specific capacities of nearby wells were examined to evaluate the possible yield of a well drilled to supply water for this project.

Specific capacity (C_s) is the amount of well yield in gallons per minute obtained per foot of drawdown (gpm/ft) and is determined by aquifer productivity and well efficiency. The following specific capacities were reported:

- On the LOTT Hawks Prairie facility approximately 1 mile east of the Project Site (Table 3-4 in HDR, 2018):
  - Qva Aquifer: 6.2, 10.5, and 13.9 gpm/ft (average 10 gpm/ft).
  - Qc Aquifer: 1.0 and 12.1 gpm/ft (average 6.6 gpm/ft).
- The City of Lacey's Betti Well, about half a mile north of the Project, was tested at 1,200 gpm with a specific capacity of 6.8 gpm/ft (Figure 3). Mathieu (2008) interpreted the well's two screened intervals to be completed in the Qc aquifer, though the lower screened interval may be completed in the TQu aquifer.
- Logs of water wells greater than 80 feet deep (e.g., more likely to be in aquifers below the Qgt) in sections surrounding the Quiemuth project were downloaded from Ecology's on-line database (128 logs; Sections 1-4 and 9-16 in T18N/R1W; accessed November 2022). Wells in this database are generally located to the ¼-¼ section resolution. Specific capacities were calculated where the information allowed (68 logs; Figure 6). Values range from less than 1 gpm/ft to 420 gpm/ft with a mean of 16 gpm/ft and median of 2 gpm/ft (not sorted by aquifer).

Careful well construction and development can maximize well efficiency. The specific capacity values observed in many of these wells could be higher with optimum well construction practices and development. Therefore, specific capacity values are considered conservatively low estimates of what might be achieved.

These specific capacity measurements can be combined with available drawdown estimates to roughly predict the yield of a well drilled for the Quiemuth project (Table 5).

Table 5: Potential well yields based on average aquifer parameters.

Representative Aquifer Properties	Qva/Qga	Qc	TQu
Specific capacity (C_s; gpm/ft)	10 [a]	6 [b]	10.2 [b]
Estimated available drawdown at Quiemuth project site (feet) [c]	10	30	115
Potential well yield (gpm)	**100**	**180**	**1,160**

[a] HDR (2018)

[b] Median of values in Table 5a in HDR (2021).

[c] Available drawdown estimated from groundwater level contours in HDR (2021) relative to top of aquifer from MW-21 log.

Based on these estimates, a single well completed in the TQu aquifer is most likely to provide the desired yield needed for the project and is the only aquifer considered further. Actual yields can only be confirmed upon installation and testing of a well and will be a function both of well construction and aquifer transmissivity. The closest City of Lacey well is the Betti well, located about 0.6 miles to the north of the project site. This well is drilled to a depth of 390 feet and has a reliable pumping rate of 980 gpm (Murraysmith, 2022). It is reported as being completed in the Qc/Qpg aquifer but may also tap the upper TQu aquifer.

Any well installed for this project should be constructed with a 100-foot sanitary control area if it is to be consistent with Washington State Department of Health (DOH) guidelines (WAC 246-290-135).

2.2. Water Rights

This section discusses potential impacts to streams and other groundwater users from development of on-site water supply, key considerations in the context of water allocation and water rights in Washington State.

2.2.1. Potential Impacts to Streams

The project site is in the Woodland Creek watershed less than 1.5 miles east of the creek's main channel (Figure 2). Woodland Creek provides habitat for salmonids

including coho and fall chinook and is closed year-round to further appropriation (Ecology, 2021; WAC 173-513-040). Groundwater development at the project site is likely to have some impact on Woodland Creek and its tributaries.

The largest groundwater contributions to Woodland Creek system come from the Qva aquifer (HDR, 2018 p. 46, see also HDR, 2021 p. 9). Possible impacts on Woodland Creek due to groundwater withdrawals from deeper aquifers have been recognized in previous studies:

- The City of Olympia and the Nisqually Tribe jointly completed the McAllister Wellfield project, located about 2.5 miles southeast of the project site, to supply water for both entities. Modeling in support of the wellfield project suggested possible but not conclusive depletions of summer streamflow in Woodland Creek of roughly 0.01 cubic feet per second (cfs) due to pumping of these municipal supply wells in the undifferentiated Qpg aquifer (City of Olympia and Nisqually Indian Tribe, 2008). The City and the Tribe agreed to mitigate this possible impact by recharging reclaimed water at the Woodland Creek Groundwater Recharge Facility about two miles southwest of the project site. This facility also mitigates for new and transferred municipal water rights (Ecology, 2017a). At this facility reclaimed water is recharged to the glacial outwash units via three infiltration galleries to augment streamflow about one mile downstream of the facility.
- Developers in the Woodland Creek watershed applied for water rights for withdrawal of groundwater from the Qc and TQu aquifer to supply housing developments to the northwest/downstream of the Quiemuth project site. As part of the water right process, they developed a groundwater model to determine the extent of impacts on the creek. They agreed to mitigate those impacts by pumping 18 gpm (0.04 cfs) of groundwater year-round from the deeper aquifer and releasing it to a pond in the upper reaches of a tributary to Woodland Creek (Ecology, 2017b).

The magnitude of the impact of groundwater withdrawal for the Quiemuth project would be best assessed with a groundwater model that takes local stratigraphy and the connections between surface water and groundwater and between aquifers into account. Such an effort would involve investigation of the geologic and hydrogeologic conditions between the project site and Woodland Creek, an area that has received less attention thus far than areas to east of the project site. Modeling is likely to indicate some impact from project groundwater withdrawals to the creek. The impact is expected to be less if project wells tap the deeper TQu aquifer. According to a tracer test conducted as part of the LOTT RWIS, the Qc aquifer in this area is connected to the overlying Qga aquifer (HDR, 2019).

In mitigating the expected impacts, the Quiemuth project may develop its own program or participate in another mitigation project. If the project opts for an onsite wastewater treatment system that produces reclaimed water (see Section 4), this reclaimed water could be used to recharge the Qva aquifer at a suitable on-site or off-site location and thus augment streamflow. If the project does not produce reclaimed water, mitigation may be in the form of delivery of reclaimed water from the City of Lacey's Martin Way Reclaimed Water Plant, if it becomes available, to groundwater, or acquisition of another water right to be dedicated to mitigation.

2.2.2. Potential Impacts to Other Groundwater Users

Impacts from pumping groundwater on other groundwater users are acceptable under Washington State water law if they do not preclude exercise by other groundwater users of their water supply. Thus, lowering the water level in an existing well due to operation of a new well is not in itself an unacceptable impact. Rather the evaluation of these impacts considers operational constraints, and it is incumbent upon owners of existing groundwater rights that their wells fully penetrate the aquifer from which they are allowed to withdraw water and that their well is reasonably efficient.

For an initial evaluation, water-level impacts from a water-supply well for this project are estimated using aquifer hydraulic properties, the expected location of a well for the project, and the distance-drawdown relationship for the desired rate and duration of

pumping (Cooper and Jacob, 1946; Table 6; Figure 7). These calculations estimate the lowering of the water table at a given distance for a given pumping rate and duration in an idealized aquifer:

$$\Delta s = 528 * Q / T$$

$$r_o^2 = (0.3 * T * t) / S$$

Δs = drawdown per log cycle in a distance-drawdown plot (feet)

T = transmissivity (gpd/ft)

Q = pumping rate (gpm)

r_o = distance at which there is no drawdown (feet)

t = pumping cycle in days (in this situation, 0.75 days to equal maximum 18-hour pumping cycles)

S = aquifer storage (unitless)

Table 6: Radius of pumping influence for expected characteristics of project supply well

Aquifer	T		S	r_o	Δs @ 928 gpm	Chosen Drawdown Threshold for Impact	r @ drawdown threshold
	gpd/ft	ft^2/d		(feet)	(feet per log cycle)		(feet)
TQu [c]	39,000	5,200	0.0004	4,300	12.6	3 feet	2,700

T = transmissivity; S= storativity

r_o = Distance from a pumped well at which there is no drawdown for given length of pumping cycle (18 hours in this case).

Δs = change of water level (feet) per log cycle of distance.

r = radius from pumped well

Source of aquifer properties (T and S) is Mathieu (2008).

As part of this calculation method, a tentative drawdown threshold of 3 feet for the TQu Aquifer was selected to reflect an acceptable impact given the available drawdown (Table 5; Figure 7). It is assumed that drawdown interference of this magnitude will not constitute impairment. The resulting radius of possible impairment (2700 ft) was applied to the proposed well location for the project as well as the border of the entire site (Figure 8).

The potential for impairment is determined by the proximity of nearby wells and also the aquifer from which they draw water. Groundwater users within this zone of possible impairment were identified in two ways:

1. Ecology's water rights database was queried for groundwater rights within Sections 1, 2, 3, 10, 11, 12 and 15 of Township 18N, Range 1W (Ecology, 2020; Table 7; Figure 8; Attachment B). Slivers of section 4, 9, and 14 were ignored in this query. In Ecology's water rights database, the administratively-issued groundwater right certificates and permits are located to the ¼-¼ section at best and are sometimes inaccurate. Where possible, the locations of the certificates and permits were refined based on information in the water right documents, and the certificates and permits were matched to the well logs for their points of withdrawal.

Table 7: Nearby groundwater rights

(for Sections 2, 3, 10, & 11 of T18N R1W, which have more than 40% coverage by zone of possible impairment for TQu aquifer; constant year-round)

Type	Count
Certificates	18
Superseding certificates	3
Permits	1
Claims	50
Claims by section:	
Section 2	*6*
Section 3	*7*
Section 10	*8*
Section 11	*29*

The eleven water rights identified via this process are listed in Table 8 and include several for businesses no longer in operation. For instance, some are for mobile home parks since replaced by commercial buildings. Most significantly for this analysis, water right G2-23075CWRIS was granted to the J.D. Shotwell Co.in 1975

to supply a temporary gravel crushing and asphalt batch plant operation that no longer exists.

Table 8: Water Rights Located within Zone of Potential Impairment for TQu Aquifer

Document Number	Purpose	Individual/Business Name	Priority Date	Qi (gpm)	Qa (afy)	Well Log Number(s)
G2-*03135C (certificate)	DM	A H Thompson	3/31/1953	140	224	21759
G2-*03216C (certificate)	IR	R J Hamlin	5/14/1953	16	12	
G2-00386C (certificate)	DS	Capitol City Rifle & Skeet Club	1/29/1968	10	2	24912
G2-*09253C (certificate)	CI	Olympia Sand & Gravel Co	3/1/1968	150	121	27972, 273373, 27920, 273372*
G2-20427 (superseding certificate)	IR,DM	Hill-Betti Business Park LLC	10/10/1972	115	30.2	22413, 22415
G2-21793C (certificate)	DM, FR, IR	WA Natural Resources Dept	1/11/1974	40	6	
G2-23075CWRIS (certificate)	CI	J D Shotwell Co	8/15/1974	200	29.5	25381
G2-21463 (superseding certificate)	IR	North Thurston Life Center	9/18/1975	20	1.5	
G2-27007C (certificate)	DM	Lacey City	8/13/1987	1000	468.3	405357
G2-27286 (certificate)	CI	Miles Sand and Gravel Co	3/8/1988	60	97	see Olympic S&G
G2-30249 (permit)	MU	Lacey City	4/28/2005	1000	600	405357

* Exact wells not clear.
gpm gallons per minute
afy acre-feet per year

Purposes:

CI Commercial and Industrial
DM Domestic Multiple
DS Domestic Single
FR Fire Suppression
IR Irrigation
MU Municipal

Because the validity of claims is generally tenuous, nearby claims were noted but not considered further. Ecology only reports their locations to the resolution of a section.

One water right (G2-21463) is apparently located on land currently owned by the Tribe (Figure 8, Table 9, Attachment B).

Table 9: Quiemuth property groundwater right

Water Right	Purpose	Name	Priority Date	Qi (gpm)	Qa (afy)	Irrig. Acres	TRS ¼-¼ / ¼
G2-21463C	Irrigation	North Thurston Life Center	9/18/1975	20	1.5	0.75	T18N/R01W-11 NE/NW

Qi = Instantaneous quantity
Qa = Annual quantity, acre-feet per year (afy)
TRS = Township/Range-Section
¼ = the quarter of the section
¼-¼ = the quarter of the quarter section

The listed owner is the North Thurston Life Center, and the purpose and place of use is for irrigation of 0.75 acres. A viewing of readily-available air photos in Google Earth yielded no evidence of recent irrigation, and so the validity of the water right is not known. Water rights are by default appurtenant to the land and are owned by whomever owns the land. If this water right is actually associated with the property and if the Tribe is not interested in maintaining this water right, it could be voluntarily relinquished.

2. Ecology's well log database was queried for the logs for wells > 80 ft in depth in Sections 1-4 and 9-16. The locations of most wells within and near the estimated zone of potential impairment were refined to match the well address, parcel number, or sketched locations provided on the well logs. As mentioned above, wells were matched to corresponding water rights where possible. Some of the unmatched wells may be permit-exempt wells used for domestic supply. Fourteen wells were identified in the zone of potential impairment (Table 10).

Table 10: Wells Location Within Zone of Potential Impairment for TQu Aquifer

Well Log Number	Owner	Completion Date	Depth (ft)	Diameter (inches)	Associated Water Right	Elevation of Well Bottom (ft amsl)
30009	TOM MARTIN	8/27/1974	237	10		-19
22414	BRUNO BETTI	10/19/1972	218	8		26
27968 & 27972	OLYMPIA SAND & GRAVEL CO.	Deepened 12/29/1961.	344	12		**-154**
27970	OLYMPIA SAND & GRAVEL CO.		142	8	G2-*09253C	21
273373	OLYMPIA SAND & GRAVEL CO.	5/1/1992	195	8	G2-*09253C	-29
405357	CITY OF LACEY	3/22/2005	392	20	G2-27007C & G2-30249	**-164**
21759	ALVIN THOMPSON		171	8	G2-*03135C	37
22413	BRUNO BETTI	12/3/1980	211	8	G2-20427	22
22415	BRUNO BETTI	10/1/1991	198	6	G2-20427	51
22517	CAPITAL DEVELOPMENT CO.	2/15/1993	117	6		112
24912	GORDON BALL ENTERPRISES		230	10	G2-00386C	-11
25013	H. D. FOWLER INC.	6/19/1985	203	6		30
25381	J. D. SHOTWELL COMPANY	8/31/1970	481	8	G2-23075CWRIS	**-276**
273372	OLYMPIA SAND & GRAVEL	5/1/1992	157	8	G2-27286	3

The elevation of each well location was combined with the well's depth to calculate the elevation of the bottom of each well, in order to identify the aquifer which the well most likely taps. Generally the top of the TQu aquifer is at or below -100 ft amsl (Appendix A in HDR, 2021). Only three wells within the zone of potential impairment are deep enough to possibly withdraw water from the TQu aquifer:

- The City of Lacey's Betti Well, currently in use for the City's municipal supply and known as S29.

- A well drilled for Olympia Sand and Gravel that was deepened to 344 ft in 1963. According to the well log, the well was located on the border between the NE and SE quarters of the SW quarter of section 10, placing it south of I-5 and on land no longer owned by Olympic Sand and Gravel. The well is not associated with any water rights found in the search of water right records in this area. Given the uncertainty about the current use of this well, potential impacts on this well are not considered.

- A well drilled for the J.D. Shotwell Co. in 1970, corresponding to the water right G2-27286 mentioned above and servicing a temporary gravel crushing and asphalt batch on the site of the Thurston County Hawks Prairie Landfill that no longer exists. Potential impacts on this well are not considered.

In summary, the above efforts identified only one well that is deep enough to likely be impaired by a well installed into the TQu for this project. The City of Lacey's Betti Well is located 2,475 ft from the project site, and distance-drawdown calculations estimate 3.5 ft of drawdown in the Betti Well when pumping from a well installed for this project. According to the well log, when pumped for 1,200 gpm for 24 hours, the Betti Well experienced 66 ft in drawdown. Under water rights G2-27007 and G2-30249, the well is permitted for a pumping rate of 1,000 gpm, so expect drawdown of 55 ft. Available drawdown (from current drawdown when pumping to top of well screen) is approximately 120 ft.

If a groundwater supply is pursued for this project, a more complete analysis of potential impairment should be conducted. This analysis should include an examination of the full well report for the Betti Well. The above calculations are not such an analysis but do provide a preliminary assessment of the issue.

2.3. Groundwater Quality

2.3.1. Natural Groundwater Quality

Water quality of the local aquifers is generally good except for localized areas where iron and manganese exceed the US EPA's secondary maximum contaminant levels (MCL),

which address chemicals that have aesthetic concerns in drinking water but do not pose threats to health. Iron and manganese can lead to nuisance staining and precipitation issues in the water distribution system and fixtures. Manganese in one of the City of Lacey's Hawk Prairie wells exceeds the secondary MCL, and the city treats this water for iron, manganese, hydrogen sulfide, and ammonia (Murraysmith, 2022). If present in the project water supply, iron and manganese can be treated, but the treatment system will add a considerable cost to the development of an on-site water system.

2.3.2. Potential Groundwater Contamination

The water quality of an onsite water supply can be affected by the introduction of contaminants to groundwater by activities on the land surface. The water table aquifer is most susceptible to contamination, while lower aquifers are partially protected by low permeability units above them. For the Quiemuth project, the likely aquifer is the TQu aquifers, which lies below several aquitards and aquifers (Table 1). Because of the opposing flow directions of groundwater in the different aquifers (Figure 5), sources of contamination in the general vicinity of the project site are considered, rather than in a more constrained "upgradient" direction.

As an indication of possible water-quality threats in the area, a contaminated sites inventory was commissioned, covering a one-mile radius centered roughly on the project property (Attachment C; Figure 9). The contaminated sites inventory identified 18 sites of concern in the vicinity of the project site (Table 11). The Confirmed and Suspected Contaminated Sites List (CSCSL) includes sites where releases of contaminants occurred. Resource Conservation and Recovery Act (RCRA) sites include sites at which contaminants are handled but where contamination has not necessarily been released to the environment. Therefore, sites on the CSCSL are of greater concern than RCRA sites. The dry cleaner's facility at the Lacey Urban Center (Site 17) raises the most concern because chlorinated solvents are notoriously difficult to remediate. These chemicals can sink down through groundwater and are persistent. No evidence of contamination from this site reaching existing supply wells was found in the review of information conducted for this report.

Table 11: Potential contamination risks within approximately one-mile radius

Id.	Site Name	Program(s)	Contaminant	Comments	Concern
	Tacoma Smelter Plume (entire region)	CSCSL NFA	Arsenic and lead in soil	No further action required. Includes Quiemuth Village Mixed Use project site.	N
1 & 2	Hawks Prairie Commercial	VCP, CSCSL NFA	Arsenic and lead in soil		N
3	Lacey Gateway Parcel	CSCSL, VCP	Arsenic and lead in soil	No further action required. Includes Quiemuth Village Mixed Use project site.	N
4	Penske Truck Spill	CSCSL, SPILLS	Petroleum product spill to soil		P
5	7-Eleven 2361 - 3456	SPILLS	Past gasoline spill onto pavement.	Gas station.	N
6	Evergreen Sportsman	CSCSL, VCP	Arsenic, lead, and petroleum products in soil. Cleanup in progress or complete.		P
7	Britton Parkway Fill		None	Permit for fill.	N
8	Walmart Supercenter	RCRA-SQG, SPILLS, MANIFEST	None	Small quantity hazardous waste generator	N
9	Pacific Pride Marvin	HSL, CSCSL	Diesel, lead, and organic contaminants in soil.	Gas station. No longer exists.	N
10	Hazo Drum Site	RCRA NonGen / NLR	None	Hazardous waste handler.	N
11	TEC Equipment	NPDES	None	Stormwater management during construction.	N
12	Hawks Prairie Marvin		None	Closed landfill.	P
13	Thurston County Landfill	RCRA NonGen / NLR	None	Closed landfill.	P
14	Penske Truck Leasing		None	Hazardous waste generator.	N

15	Cabelas Store 026	SPILLS	Unknown - past illegal dumping on roadway pavement.	Small quantity hazardous waste generator.	N
16	Tangle Wild Arco	CSCSL, LUST	Petroleum products	Gas station. Past LUSTs removed and presumably cleaned up. Currently operating and storing petroleum.	P
17	**Lacey Urban Center**	**CSCSL, VCP**	**Halogenated solvents in soil**	**Legacy dry cleaner, in remediation.**	Y

Concern: N = No; P = Possible; Y = Yes
Site locations shown on Figure 9. Site descriptions in Attachment C.

Programs and databases:
CSCSL: Confirmed & Suspected Contaminated Sites List (Washington State Dept. of Ecology)
CSCSL NFA: Confirmed & Suspected Contaminated Sites List - No Further Action
HSL: Hazardous Sites List (subset of CSCSL)
LUST: Leaking Underground Storage Tanks Site Lis
NPDES: Water Quality Permit System Data
RCRA NonGen NLR: RCRA - Non Generators / No Longer Regulated
RCRA-SQG: RCRA - Small Quantity Generators
SPILLS: Reported Spills
VCP: Voluntary Cleanup Program

The other sites mostly involve soil contamination or interactions with the environmental regulatory system that do not involve the release of contaminants. Since the entire region received airborne deposition from the Asarco Smelter in Tacoma, sites 1, 2, and 3 involve only arsenic and lead contamination in the soil, which is not a concern for deep groundwater. Sites 4, 6, and 16 report contamination only in the soil profile and not groundwater. Some sites handle hazardous materials and have no documented contamination of the environment other than a spill on pavement at one site that was cleaned up. The former Thurston Co. Hawks Prairie Landfill is located approximately 1,700' east of the project and was closed in 2000 (, is undergoing remediation, and is not an identified threat of groundwater contamination to the project.

The recharge of reclaimed water from the LOTT Hawks Prairie facility also impacts the groundwater quality in the area (HDR and others, 2022; Figure 2). The RWIS focused on the fate of residual chemicals that remain in the water after wastewater treatment and identified two compounds that have been introduced into the Qga aquifer through recharge that have very small but non-zero risks to human health (Intertox, 2022). These compounds, which are currently unregulated, will likely reach the Qc aquifer at reduced concentrations in the future.

2.3.3. Cumulative Impacts of On-Site Groundwater Development for Both Quiemuth Projects

The Quiemuth Casino-Resort project, adjacent to the Quiemuth Village Mixed Use Project, is also considering on-site groundwater supply. The well yield required to meet the peak daily water demand of the Casino-Resort is estimated at 351 gpm (Table 3 in Coho, 2023). This quantity is the highest estimated demand among the three alternative development scenarios for the project. The combined desired well yield for the two projects is estimated at 1,279 gpm. In the event of the completion of both projects, the combined desired maximum well yield could most likely be met by one or more wells completed in the TQu aquifer.

This larger demand may result in increased impacts on Woodland Creek and a larger radius of potential impairment (on the order of 3,200 ft in the simple distance-drawdown

calculations) and possible impact on existing water rights and wells. The magnitude of these impacts would depend on the configuration of withdrawal points, including the number of wells, their locations relative to the stream system and each other, and the aquifer(s) supplying these wells.

Regarding concerns about background water quality and possible groundwater contamination, the higher rate of withdrawal of groundwater would lead to a larger capture zone for a given time period but would not alter the nature of those concerns.

3. RECHARGE OF RECLAIMED WATER

This section examines the potential for onsite infiltration of treated or "reclaimed" water from the project to groundwater. Two methods of recharge are considered:

- Surface infiltration via ponds.
- Direct recharge through wells.

The average daily production of reclaimed water from the project is estimated to be 246,862 gpd (171 gpm; Olson, 2023) Equalization capacity built into the treatment process will ensure that the maximum effluent discharge will be same as average day discharge (Olson, 2023). The quantity of water to be recharged may be further reduced by the use of reclaimed water for additional landscape irrigation, water features (e.g., fountains), and/or indoor toilets.

The LOTT Clean Water Alliance recharges reclaimed water at its Hawks Prairie facility approximately one-third mile to the northeast of the Quiemuth project site, and the RWIS has produced detailed studies that are relevant to recharge at the Quiemuth site as part of the larger RWIS. These studies cover the local hydrogeology, recharge dynamics, and the fate of residual chemicals in the reclaimed water after the chemicals enter groundwater (HDR, 2018; HDR, 2019; HDR, 2021; HDR and Intertox, 2022; Intertox, 2022).

3.1. Surface Infiltration of Reclaimed Water

In surface infiltration, reclaimed water is applied to the ground surface and allowed to passively infiltrate to the subsurface. At the project site, reclaimed water could be

discharged to unlined ponds and then infiltrate to the uppermost subsurface units, either the recessional outwash (Qgo), if present, or the till (Qgt).

The success of surface infiltration depends upon adequate infiltration capacity in the receiving unit. The geotechnical report prepared by Jacobe and Trisler (2022) provides infiltration rates in surficial sediments from their work and earlier studies (Table 13). Values derived from double-ring infiltrometer tests provide a better level of confidence than single-pipe tests, but both types of tests are run for relatively short periods of time. These infiltration rates may inform the infiltration capacity following episodic stormwater events but are less relevant to a recharge facility that operates continuously to infiltrate a large volume. The lowest infiltration rates were reported by the NE Area LID study, located on the north side of the project site, which appears to be underlain by till. The Commerce Place PID study is apparently underlain by recessional outwash. The Quiemuth project site is underlain by till, and so the NE Area LID study is considered most applicable.

Table 12: Field-measured infiltration rates.
(inches per hour; data from Jacobe and Trisler, 2022)

Jacobe & Trisler		**NE Area LID**		**Commerce Place PID / Meridian Campus**	
Single pipe		Double-ring infiltrometer			
IT1	200	TP-1	13	IT-1	9
IT2	22	TP-2	0	IT-2	3
IT3	50	TP-3	1.2	IT-3	0.25
IT4	200	TP-7	1.4	IT-4	13
IT5	8.5				
IT6	15				
Geometric Mean	**42**		**0.2**		**3**
Average	**83**		**3.9**		**6**

Given the concerns about the inadequacy of these tests to indicate long-term infiltration capacities, a representative infiltration rate of one inch per hour, lower than the averages in Table 13, is assumed to conservatively estimate the needed infiltration basin size (Table 14). The basin size scales linearly and inversely with infiltration rate, such that a halving of the infiltration rate results in a doubling of the required basin size.

Table 13: Estimated basin size for surface infiltration of reclaimed water

Average Daily Reclaimed Water Production			Infiltration Basin Size	
gpd	gpm	cfs	sq. feet	acres
216,862	171	0.38	16,501	0.38

Based on 1-inch per hour infiltration rate.

cfs = cubic feet per second

These estimates are preliminary and should be refined through further study if surface infiltration is pursued. Particular attention should be given to the infiltration capacity at depth via exploration with soil borings. Lower permeability layers can slow infiltration and may reduce infiltration enough to cause saturated mounding beneath the basin and failure of the recharge system.

3.2. Direct Recharge of Reclaimed Water Through Wells

In direct recharge, reclaimed water is routed into groundwater wells and is pumped or flows via gravity into a receiving aquifer unit. At the project site, the Qga unit offers an approximately 100-foot thickness of unsaturated sediments which can receive the reclaimed water and provide further natural treatment. Reclaimed water can flow via gravity into this unit via a large-diameter well drilled through the low-permeability clayey Qvt Till and screened over the entire thickness of the Qga. Although one well can probably provide the capacity needed for recharging the reclaimed water from the project, a second well is recommended for operational purposes.

Mounding analysis is recommended to assess the feasibility and long-term sustainability of recharge.

3.3. Treatment of Reclaimed Water for Groundwater Recharge

Reclaimed water should be treated to Class A standards if it is recharged to the ground (WAC 173-219). These standards are achievable with a Membrane BioReactor (MBR) treatment plant. Reclaimed water infiltrated from surface will achieve additional polishing treatment through the vadose zone, and reclaimed water recharged by surface infiltration

and direct injection will be further filtered by the aquifer material. Class A reclaimed water is expected to be adequately protective of human health and the environment.

3.4. Cumulative Impacts of Recharging Reclaimed Water for Both Quiemuth Projects

If both the Casino-Resort and the Mixed-Use projects proceed and select recharge of reclaimed water for wastewater disposal, the combined average wastewater load is estimated at approximately 396,000 gpd (275 gpm; Olson, 2022). Efficiencies and economies of scale may be realized. Access to the greater area of the combined dual projects area may be beneficial for dissipating resulting groundwater mounding resulting from recharge.

4. SUMMARY

On-site groundwater supply and the recharge of reclaimed water to the ground is technically feasible for the Quiemuth Village Mixed Use project. Findings are:

4.1. On-Site Groundwater Supply

- One well for groundwater supply may be adequate for the project's water supply, subject to redundancy and the reliability needs of the development (e.g., infrastructure storage). Water demand for the project (928 gpm running 75% of the time during peak demand) might be met with one well completed into the TQu aquifer. This aquifer has greater estimated yield than shallower aquifers and is more removed from surface sources of contamination.
- Because aquifer properties vary and can be unpredictable, well yields can only be confirmed upon installation and testing.
- Groundwater withdrawals will possibly impact streamflow in Woodland Creek, and further quantification and mitigation of such impacts is anticipated to be required.
- Preliminary calculations suggest that the impact of a well installed in the TQu aquifer upon nearby wells, particularly the Betti well, will be acceptable. Further study of this issue will be required if an on-site water supply is pursued.
- Jointly supplying the Quiemuth Casino-Resort and the Quiemuth Village Mixed Use Projects can likely be accomplished with one or more wells in the TQu aquifer. The larger demand of the two projects will lead to larger

impacts on Woodland Creek and possibly on existing groundwater appropriations.

- DOH guidelines require a 100-foot-radius sanitary control area (~1 acre) around a drinking water well.
- Wellhead protection risks from contamination sources appear to be minimal for a supply developed from the TQu aquifer, though the status of chlorinated solvents at a nearby dry cleaners should be more closely examined (Site 17).

4.2. Recharge of Reclaimed Water

- Surface infiltration of reclaimed water through ponds is estimated to require 0.38 acres for the project. This estimate is extrapolated from surface infiltration tests and is qualified by the possible influence of till at surface or at shallow depth across the site.
- Direct recharge by injection through wells of reclaimed water to the ~100-foot thick unsaturated portion of the Qga aquifer is considered feasible.
- Mounding analysis is recommended.
- Treatment to Class A reclaimed water standards is expected to be required for either recharge method.
- Combined impacts of the dual Quiemuth projects are anticipated to be operational efficiencies and economies of scale.

5. LIMITATIONS

This work was conducted with the standard of care normal for professionals at the time and place conducted within the limitations of available time and budget. This work relied on the sources of information cited and is not represented as a thorough review of available information. The available information is used “as is”. Coho Water Resources does not attest to the accuracy of the information nor endorse the veracity of the information.

The concepts presented in this technical memorandum are preliminary. Additional work is recommended before designing or developing on-site groundwater supply and reclaimed water recharge facilities.

6. CITATIONS

City of Olympia, 2015. City of Olympia Waste Resources Plan. Adopted by City of Olympia City Council in August 2015. Online version accessed at https://www.codepublishing.com/WA/Olympia/wr/OlympiaWRNT.html on May 22, 2023.

City of Olympia and Nisqually Indian Tribe (Olympia and Nisqually), 2008. McAllister Wellfield Mitigation Plan. Prepared by the City of Olympia Water Resources Division of the Public Works Department and the Nisqually Indian Tribe Planning Department, 351 pp.

Coho Water Resources (Coho), 2023. Quiemuth Casino-Resort Project - Assessment of Potential Groundwater Supply & Recharge of Reclaimed Water (draft). Technical memorandum prepared for Olson Engineering, April 20, 2023, 36 pages plus attachments.

Cooper, H.H. and C.E. Jacob, 1946. A generalized graphical method for evaluating formation constants and summarizing well field history, Am. Geophys. Union Trans., vol. 27, pp. 526-534.

EDR, 2022. The EDR Radius Map Report with GeoCheck: Quiemuth, Thurston County, Olympia, WA. Prepared for Coho Water Resources, Sept. 9, 2022, 583 pp.

HDR, 2018. Hydrogeologic Characterization Report. Prepared for the LOTT Clean Water Alliance as part of the Reclaimed Water Infiltration Study, March 26, 2018.

HDR, 2019. Tracer Test and Water Quality Monitoring. Prepared for the LOTT Clean Water Alliance as part of the Reclaimed Water Infiltration Study, October 30, 2019, 137 pp. plus appendices.

HDR, 2021. Technical Memorandum: Steady-State Groundwater Model Development and Calibration (Task 2.1.4). Prepared for the LOTT Clean Water Alliance as part of the Reclaimed Water Infiltration Study, October 22, 2021, 123 pp. plus appendices.

HDR, Intertox, Inc., and Windward Environmental, 2022. LOTT Clean Water Alliance Reclaimed Water Infiltration Study – Project Summary. Prepared for the LOTT Clean Water Alliance as part of the Reclaimed Water Infiltration Study, Aug. 23, 2022, 48 pp.

Intertox, Inc., 2022. Human Health Risk Assessment. Prepared for the LOTT Clean Water Alliance as part of the Reclaimed Water Infiltration Study, June 20, 2022, 88 pp. plus appendices.

Jacobe, J. and D. Trisler, 2022. Preliminary geotechnical report on Nisqually Quiemuth Casino-Resort, Britton Parkway NE and Marvin Road NE, Lacey Washington. Prepared by Haley Aldrich, Inc. for Olson Engineering.

Logan, R.L., T.J. Walsh, H.W. Schasse, and M. Polenz, 2003. Geologic Map of the Lacey 7.5-minute Quadrangle, Thurston County, Washington. Washington Division of Geology and Earth Resources Open File Report 2003-9.

Mathieu, J., 2008. Hawks Prairie Area hydrogeologic characterization report. Prepared by Northwest Land & Water for the City of Lacey.

Murraysmith, Inc., 2022. Water System Plan Update - City of Lacey. Issued April 2022, 339 pp.

Olson Engineering Inc. (Olson), 2022. Water Supply and Wastewater Feasibility Study – Quiemuth Village. Prepared for Acorn Environmental. December 22, 2022. Project No. A10367.

Olson Engineering Inc. (Olson), 2023. Water Supply and Wastewater Feasibility Study – Quiemuth Casino-Resort. Prepared for Acorn Environmental. January 23, 2023. Project No. A10367.

Pacific Groundwater Group (PGG), 2021. City of Lacey Wellhead Protection Plan Update: Contaminant Source Inventory Report. Prepared for the City of Lacey, June 2021, 68 pp.

Rector, J., 2021. City of Lacey Wellhead Protection Plan, 2021 Update. Prepared for the City of Lacey Water Resources, 56 pp.

Washington Department of Ecology (Ecology), 2017a. Fact Sheet for Lott Clean Water Alliance Martin Way Reclaimed Water Plant - State Reclaimed Water Permit ST 6206. Prepared by the Southwest Regional Office. Issued April 4, 2017, 24 pp. plus appendices.

Washington Department of Ecology (Ecology), 2017b. Report of Examination (Amended) for Water Right Application #G2-29951 by Miller Land and Timber LLC. Southwest Regional Office, signed December 17, 2010, 22 pp.

Washington Department of Ecology (Ecology), 2020. Water Rights Search (online water rights database). Based upon data in the Water Rights Tracking System (WRTS) database. https://appswr.ecology.wa.gov/waterrighttrackingsystem/WaterRights/default.aspx

Washington Department of Ecology (Ecology), 2021. Watershed Restoration and Enhancement Plan: WRIA 13-Deschutes Watershed. Prepared by the Water Resources Program. Final draft plan issued March 18, 2021. 91 pp. plus appendices.

Washington Department of Ecology (Ecology), 2022. Washington State Well Report Viewer (on-line well log database). Accessed November 2022. https://appswr.ecology.wa.gov/wellconstruction/map/WCLSWebMap/default.aspx

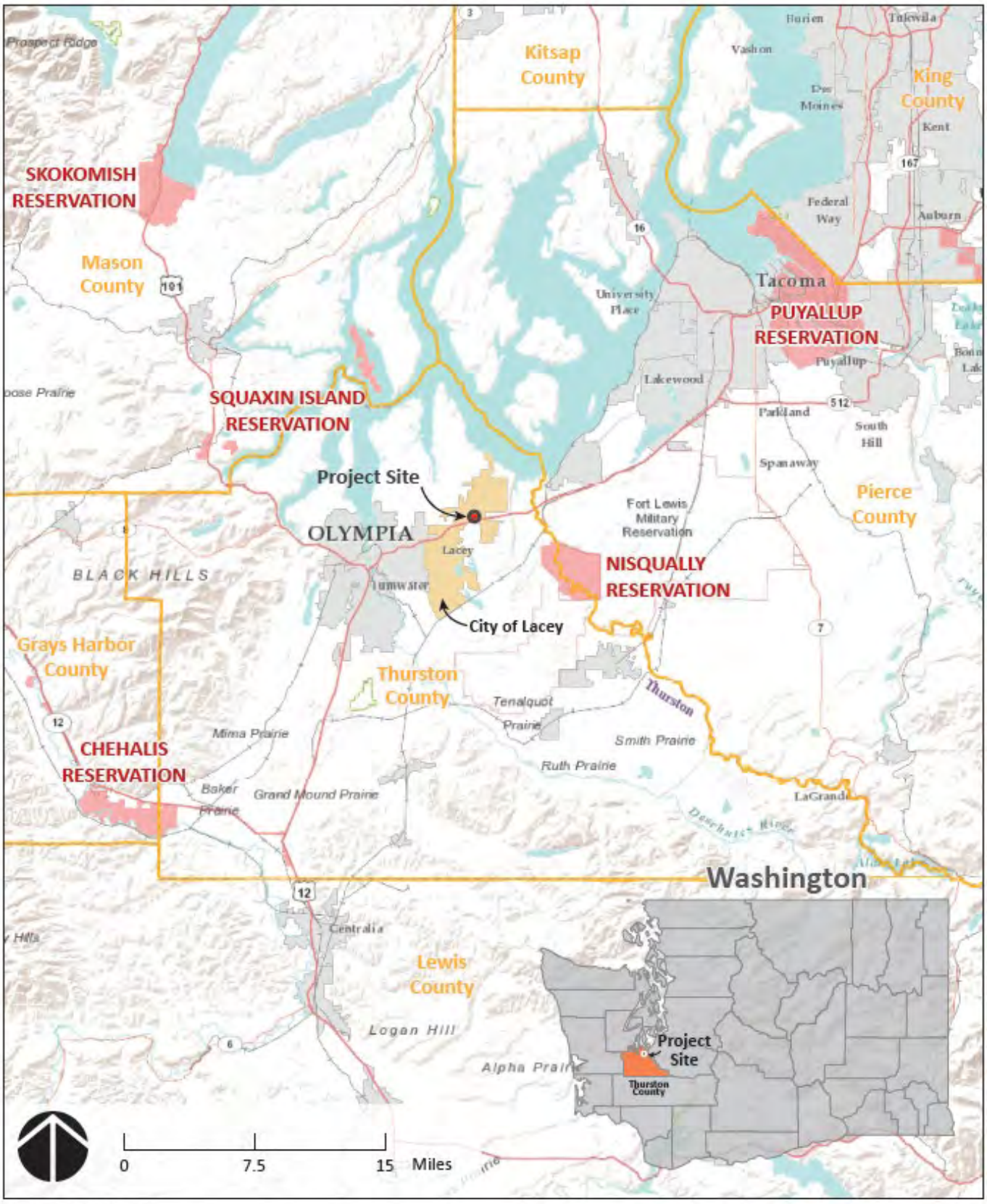
Washington Department of Health (DOH), 2023. Wellhead Protection Areas (spatial dataset). Originally issued in 2018. Datasets downloaded January 12, 2023 via Washington Geospatial Open Data Portal.

7. FIGURES

Figure 1 Regional location
Figure 2 Project site and vicinity
Figure 3 Surficial geology
Figure 4 Geologic cross section
Figure 5 Groundwater flow directions in major aquifers
Figure 6 Specific capacity of nearby wells
Figure 7 Distance-drawdown estimates
Figure 8 Groundwater rights and estimated radius of influence
Figure 9 Contaminated sites inventory and related features

8. ATTACHMENTS

Attachment A: Selected well logs
Attachment B: Nearby groundwater rights and groundwater right G2-21463
Attachment C: Contaminated sites inventory



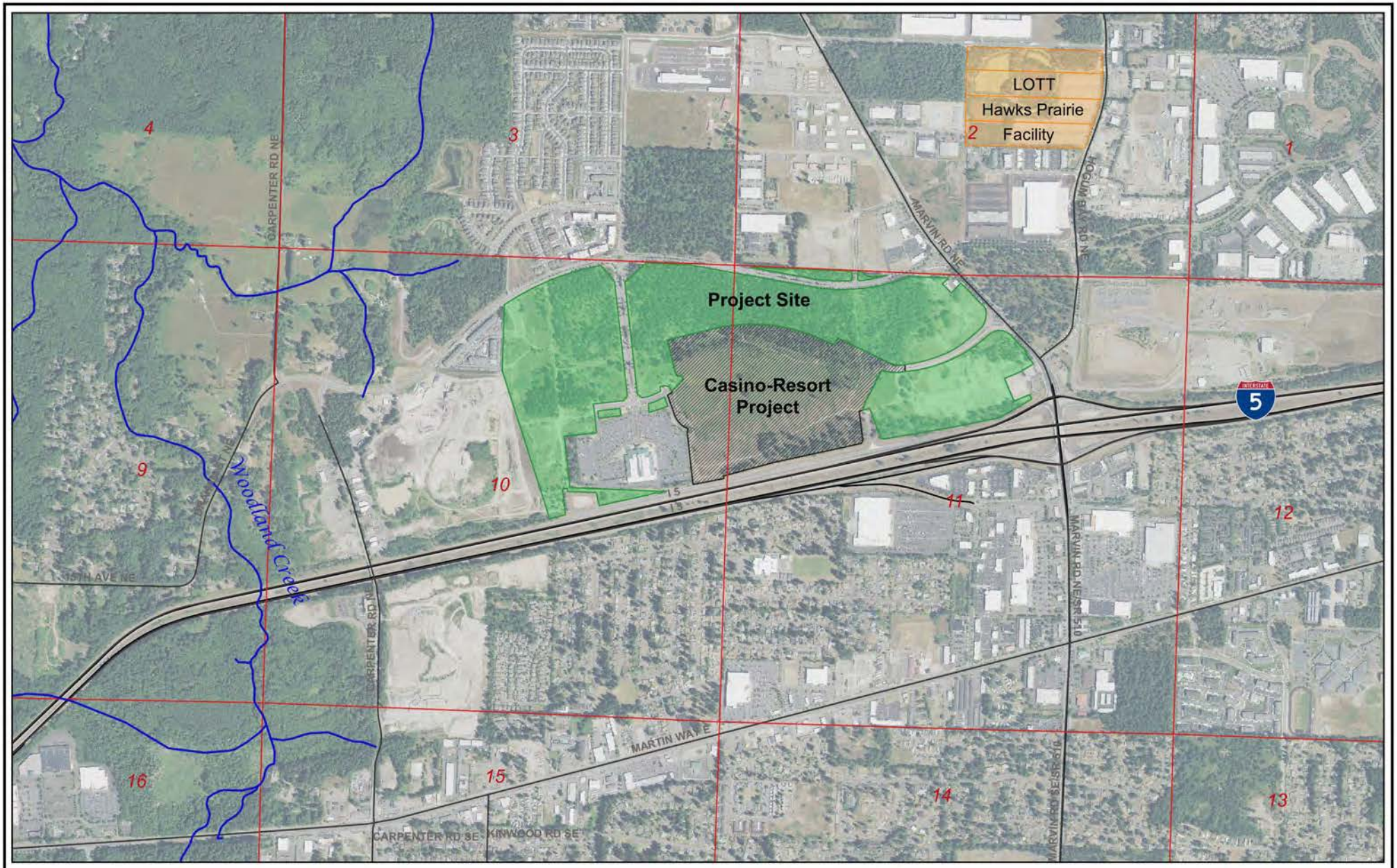
Source: ESRI, USGS, NOAA

From Acorn Environmental.

DRAFT

Figure 1
Regional location

Quiemuth Village Hydrogeology
Olson Engineering



Background image taken in 2021 by USDA National Agriculture Imagery Program.

All sections in T18N R1W.

0 1,000 2,000 3,000 ft

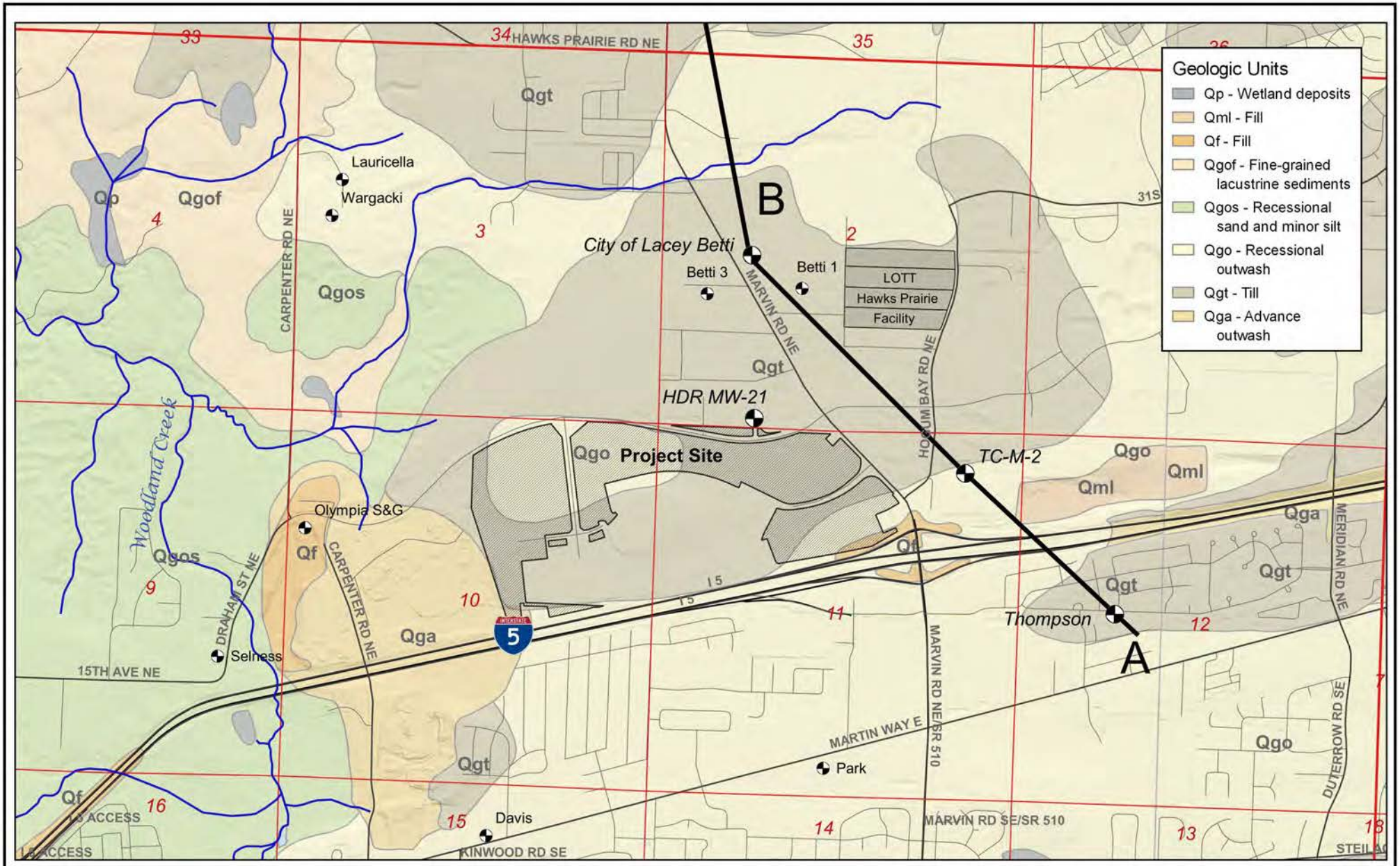
DRAFT

Figure 2

Project Site and Vicinity

Quiemuth Village Hydrogeology

Olson Engineering



Surficial geology from Logan and others (2003). See Table 1.
See Figure 4 for corresponding subsurface geology of cross-section line.
Northernmost sections in T19N, R1W. All others in T18N, R1W.

Wells (logs for all but TC-M-2 in Attachment A)

Cross-section line (Mathieu, 2008)

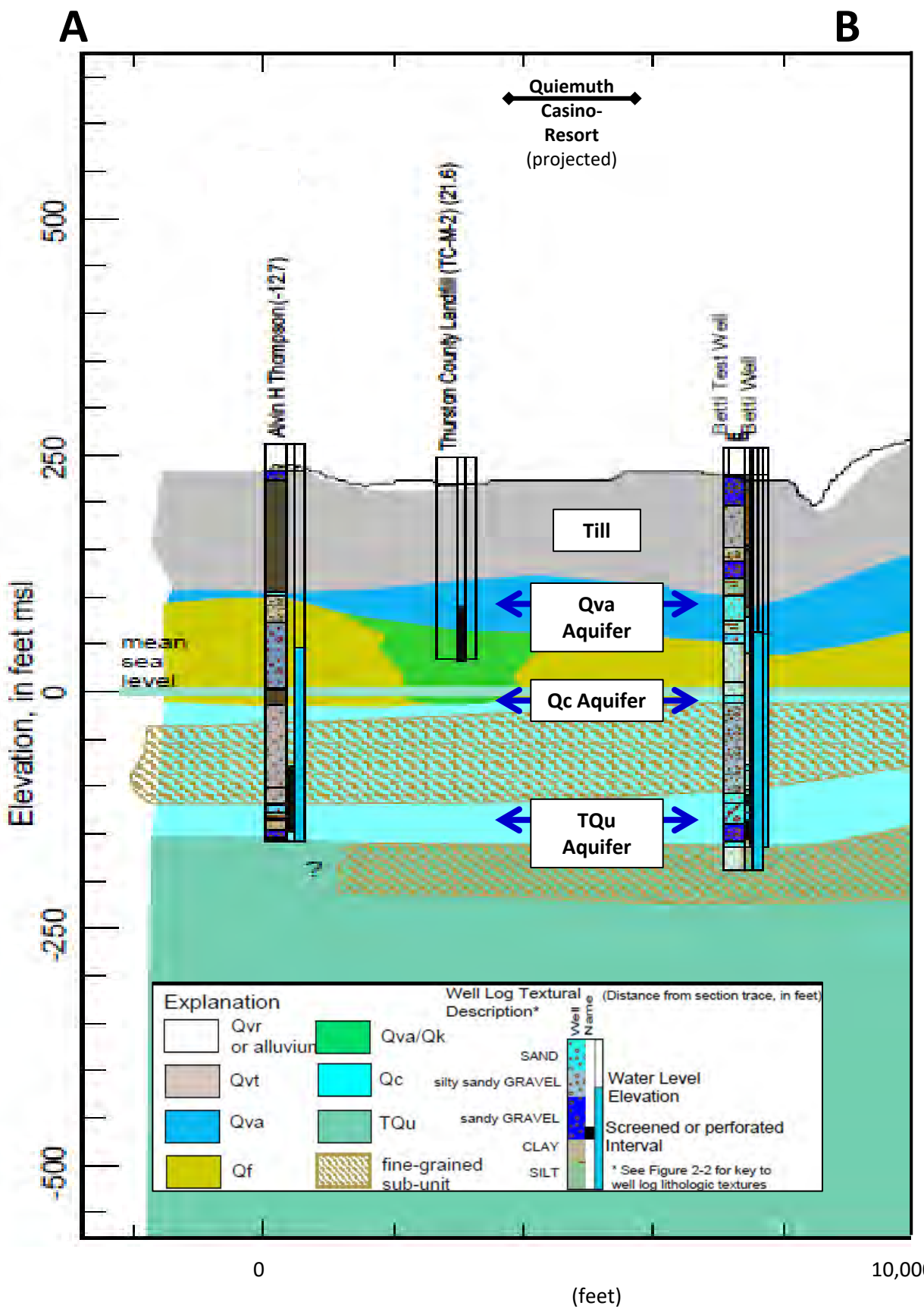
0 0.25 0.5 0.75 1 mi

DRAFT

Figure 3

Surficial Geology

Quiemuth Village Hydrogeology
Olson Engineering



From Mathieu (2008). Looking to the southwest.
See Figure 3 for cross-section location.
"?" below Thompson well indicates uncertainty about underlying units since well did not extend beyond Qc aquifer.

DRAFT

Figure 4
Geologic cross section

Quiemuth Village Hydrogeology
Olson Engineering

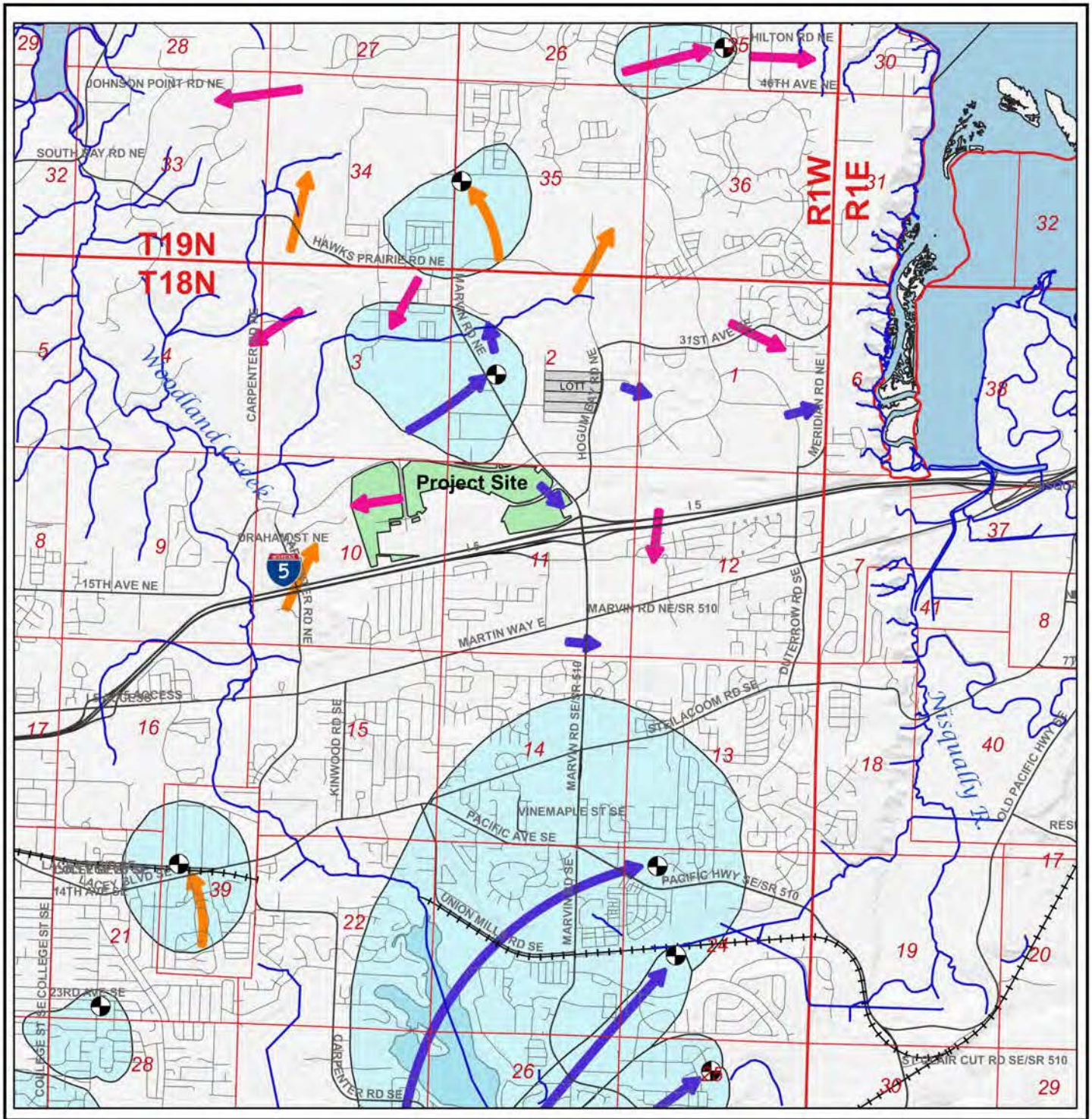
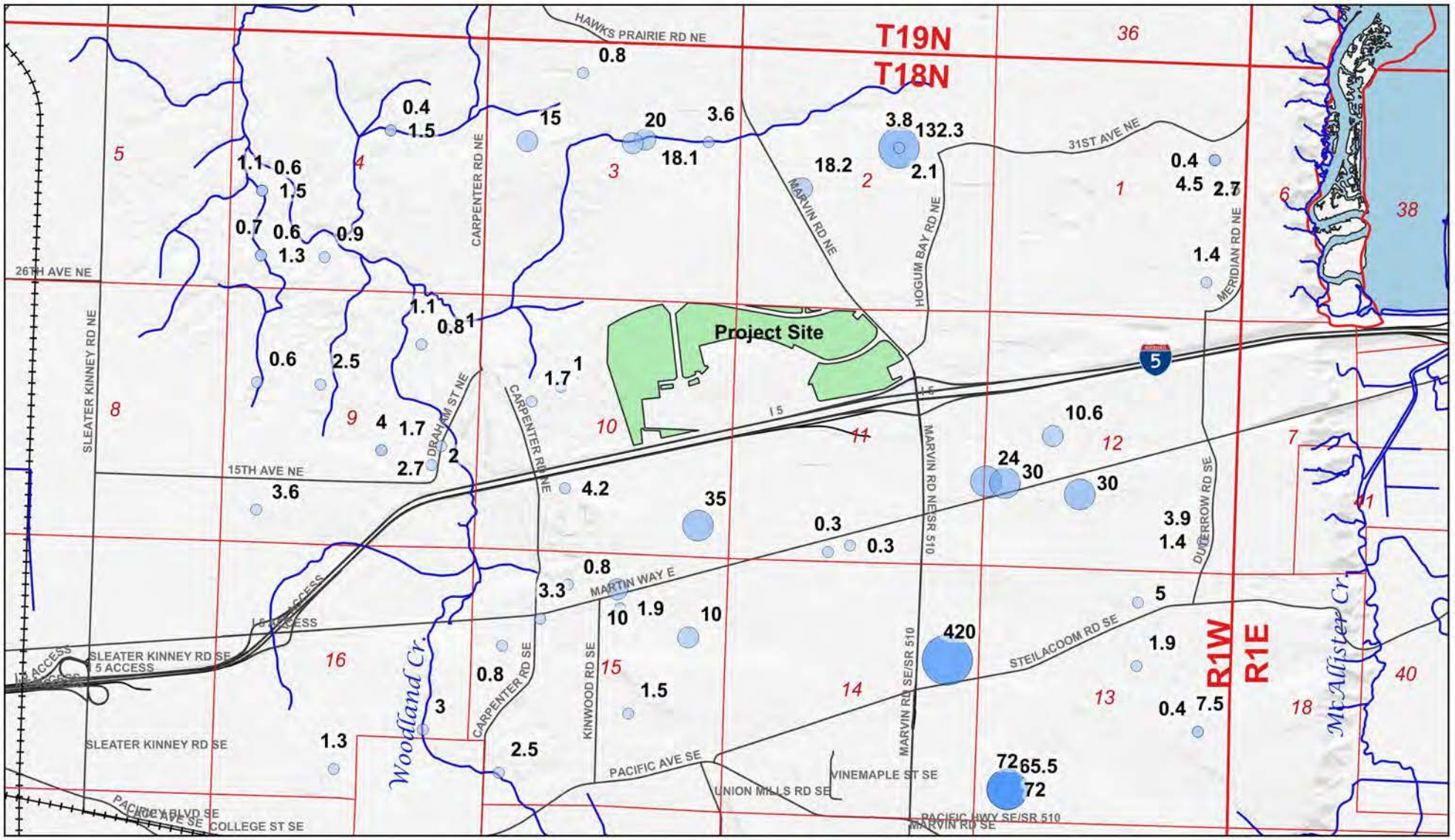


Figure 5

DRAFT

Groundwater
Flow Directions
in Major Aquifers

Quiemuth Village Hydrogeology
Olson Engineering



Specfiic capactiy in gpm/ft.
Data from logs for wells > 80' deep located within sections 1-4 and 9-16 of T18N, R1W.
Wells located to quarter-quarter section.
Database does not idientify aquifer from which wells pump.
Multiple numbers around a point indicate multiplce wells in that quarter-quarter.
From Ecology's on-line well log database.

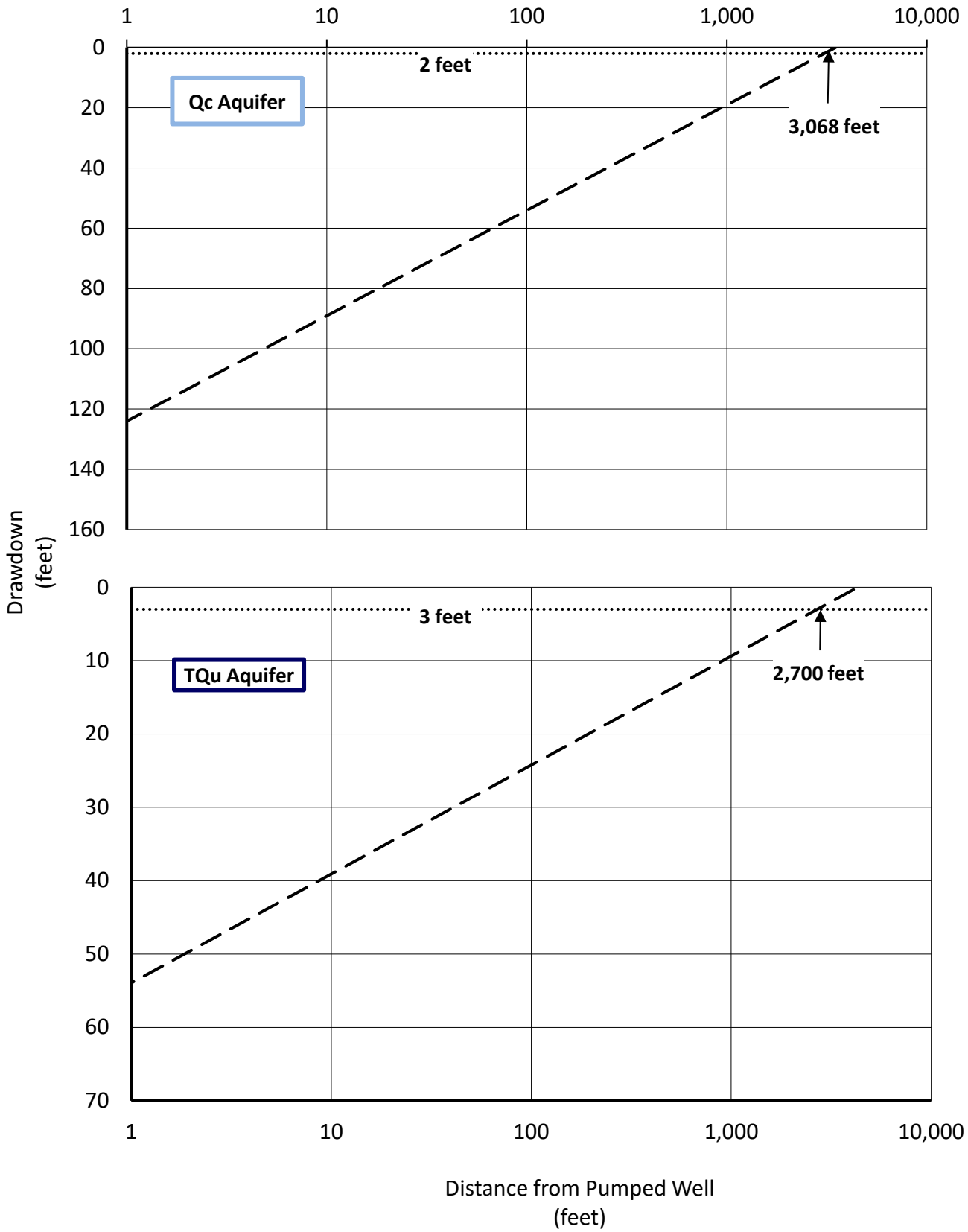
0 0.5 1 1.5 mi

Figure 6

DRAFT

Specific Capacity of Nearby Wells

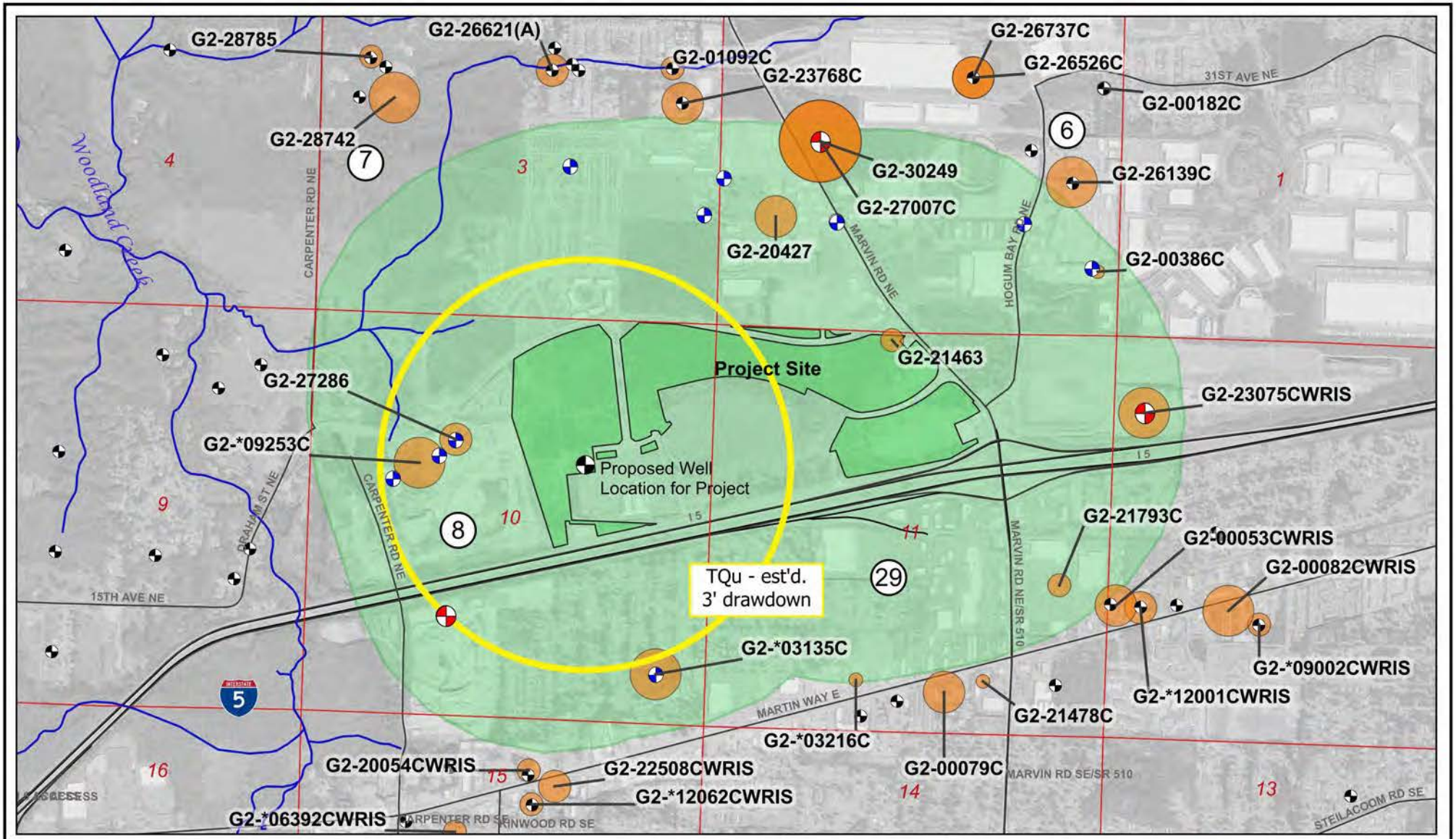
Quiemuth Village Hydrogeology
Olson Engineering



Pumping 928 gpm for 18 hours.
Water level in the well may be greater than immediately outside of the well because of well efficiency effects.

DRAFT

Figure 7
Distance-Drawdown Plot
Quiemuth Village Hydrogeology
Olson Engineering



Water wells from Ecology database

- Deep wells in potential impairment zone
- Other wells in potential imparment zone
- Wells outside potential impairment zone

(7) Groundwater Claims in Section

Groundwater rights sized by instantaneous volume (see Table 8)

Estimated radius of potential impairment for TQu aquifer applied to entire project site

Estimated radius of potential impairment for proposed well location

0 1,000 2,000 3,000 ft

DRAFT

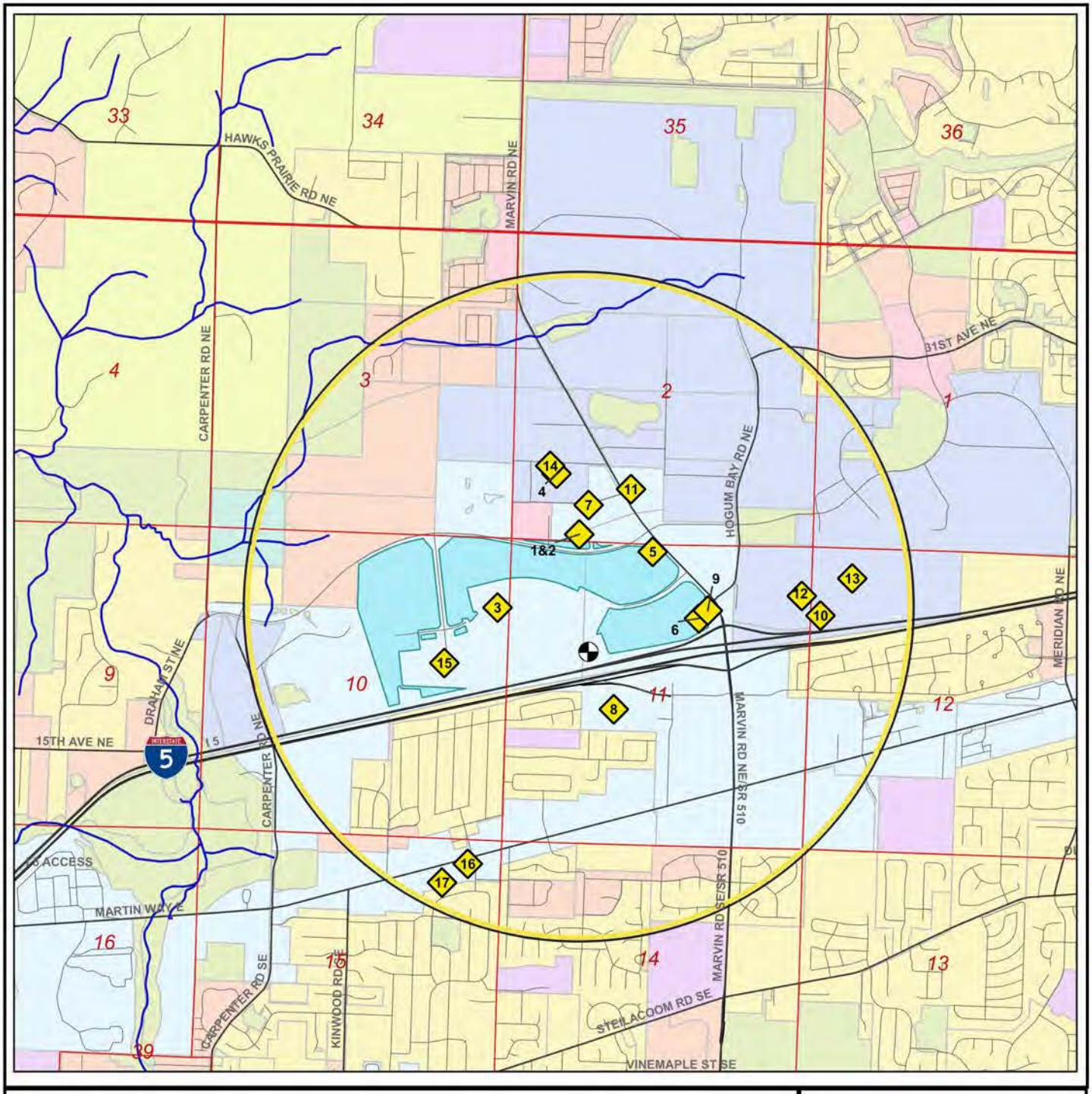
Figure 8

Groundwater Rights within Distance-Drawdown Impact Radius

Quiemuth Village Hydrogeology
Olson Engineering

Quiemuth.qgs.qgz / Water Rights 2023-05-22

Coho Water Resources



Thurston Co. Zoning
- Open space
- Agricultural
- Rural resid. and resource
- Residential - low density
- Residential - mod. to high density
- Educational
- Business/Commercial/Mixed Use
- Light industrial
- Other

Proposed Quiemuth Village Mixed Use Project

Contaminated Sites Within Search Circle (see Table 9)

Proposed Well Location for Project

0 2,000 4,000 6,000 ft

DRAFT

Figure 9

Contaminated Sites Inventory and Related Features

Quiemuth Village Hydrogeology
Olson Engineering

Quiemuth.qgs.qgz Contam Sites, WHP, and Zoning 2023-05-15

Coho Water Resources

ATTACHMENT A

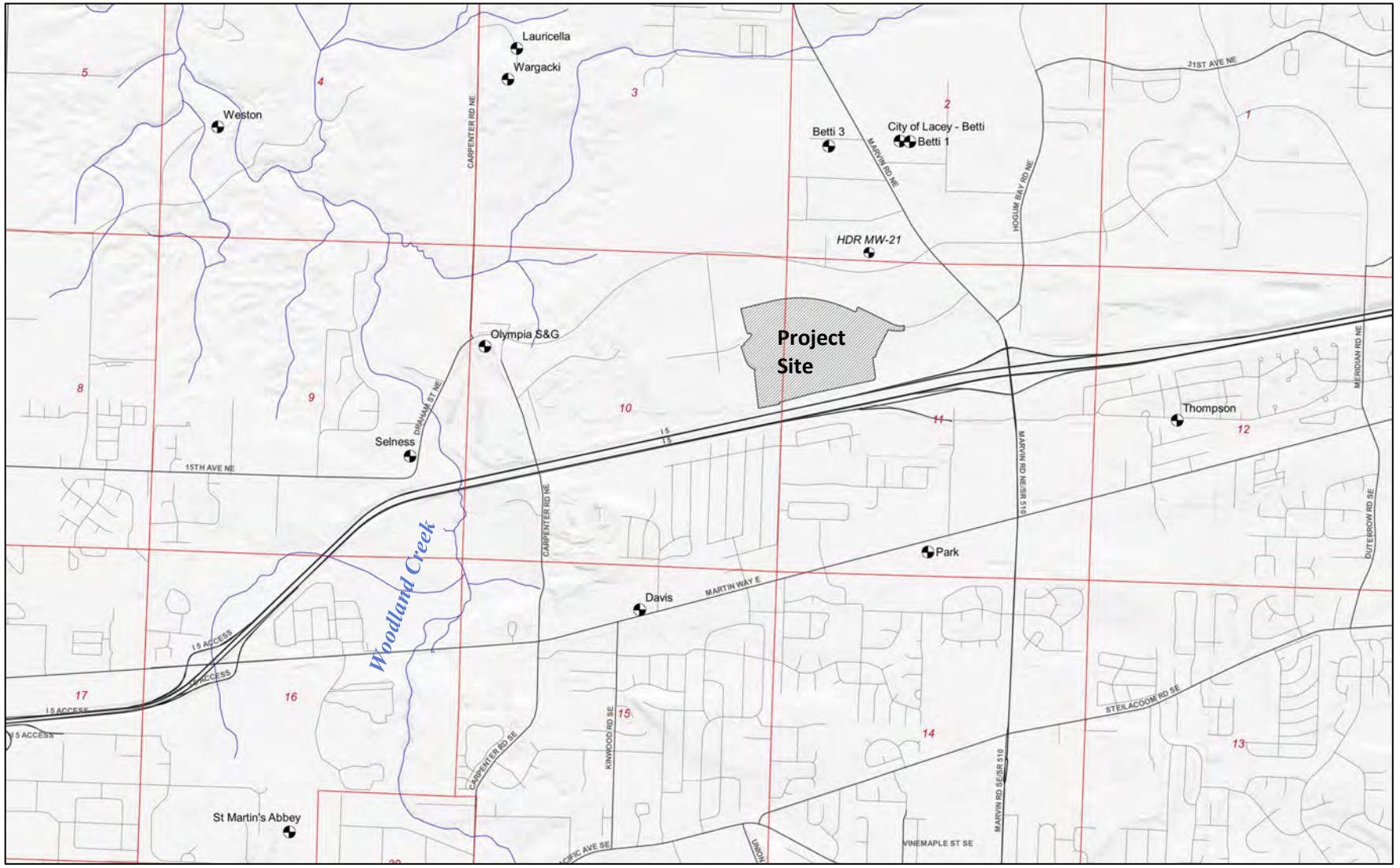
SELECTED WELL LOGS

Figure A-1: Well locations

Table A1: Selected well logs.

Ecology Well Report	UWID	Well Name (for this study)	Owner	Depth ft bgs	Diam. inches	Address	Section (T18N / R1W)	QQ/Q	Completion Date	Static Water Level ft bgs
405357	AEC941	City of Lacey - Betti	CITY OF LACEY	392	20	MARVIN RD NE	2	SW/NE	3/22/2005	170
272571		Thompson	ALVIN THOMPSON	390	12		12	NW Q	12/1/1963	186
428522	ALL311	Wargacki	JOSEPH AND LORI WARGACKI	370	6	6247 33RD LN NE	3	NW/SW	10/25/2005	89
28764		Lauricella	ROB LAURICELLA	361	6	3236 CARPENTER RD NE, OLYMPIA	3	NW/SW	4/13/1994	126
27367		Davis	MARY DAVIS	243	6	6814 Marvin Way NE, Olympia	15	NE/NW	1/20/1988	155
479083	ALN038	Park	PETER AND SUNNY PARK	220	6	7945 MARTIN WY, OLYMPIA 98516	11	SW/SE	4/12/2007	168
22413		Betti 1	BRUNO BETTI	211	8	2900 MARVIN RD	2	SW/NE	12/3/1980	175
22415		Betti 3	BRUNO BETTI	198	6	2900 MARVIN RD	2	SW/SW	10/1/1991	174
273981	ABH494	Weston	TIM WESTON	196	6	2933 Jorgenson Rd., Olympia	4	SW/NW	10/27/1993	23
273373		Olympia S&G	OLYMPIA SAND & GRAVEL CO.	195	8	Carpenter Rd., Olympia	10	NW Q	5/1/1992	90
23288		Selness	DARRYL SELNESS	195	6	1603 Draham Rd. NE, Olympia	9	SE/NW	11/30/1978	33
270672		St Martin's Abbey	SAINT MARTINS ABBEY	187	12	LACEY	16	SW/NE	8/24/1990	60
1735011*	BKX026	HDR MW-21	LOTT	310	2.5	7770 Britton Ln NE	2	SW/SW	7/24/2017	141

* Ecology log and log from HDR (2018) included.



Logs for these wells downloaded from Ecology Well Log Report online database. Wells listed in Table A1.

Approximately 1 mile.

N

DRAFT

Figure A1

Locations of Wells with Well Logs

Quiemuth Village Hydrogeology

Olson Engineering

22413 - Betti 1

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) **OWNER:** Name BRUNO BETTI Address 2900 MARVIN RD. N.E. OLYMPIA

(2) **LOCATION OF WELL:** County THURSTON SW¼ NE¼ SW¼ Sec. 2 T. 18 N., R. 1 W.M.

Bearing and distance from section or subdivision corner

(3) **PROPOSED USE:** Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(4) **TYPE OF WORK:** Owner's number of well (if more than one) .....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) **DIMENSIONS:** Diameter of well 8 inches.
Drilled 212 ft. Depth of completed well 211'-9" ft.

(6) **CONSTRUCTION DETAILS:**
Casing installed: 8 " Diam. from +1-2" ft. to 206'-11" ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☐ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☒ No ☐
Manufacturer's Name
Type STAINLESS STEEL Model No.
Diam. 8" Slot size .030" from 206 ft. to 211'-9" ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) **PUMP:** Manufacturer's Name
Type: H.P.

(8) **WATER LEVELS:** Land-surface elevation above mean sea level ... ft.
Static level 174'-11" ft. below top of well Date DEC. 1, '80
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) **WELL TESTS:** Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☐

(10) **WELL LOG:**

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 of formation.

MATERIAL	FROM	TO
BROWN SANDY GRAVEL	0	3
GRAY HARD PAN	3	35
GRAY CEMENTED GRAVEL	35	60
GRAY HARD PAN	60	133
BLUE CLAY AND WOOD CHUNKS	133	160
GRAY HARD PAN-BIG COBBLES	160	175
BROWN CLAY BOUND GRAVEL	175	178
BROWN SANDY CLAY	178	182
BROWN SANDY CLAY-MIX.GRAVEL	182	197
GRAY HARD PAN	197	203
GRAY COURSE SANDY GRAVEL	203	212
-WATER BOTTOMED OUT ON GRAY CLAY PACKED SAND		

RECEIVED
MAY 28 1982
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started OCT. 29, 1980 Completed DEC. 3, 1980

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME ROY MCGILL WELL DRILLING
(Person, firm, or corporation) (Type or print)

Address 9546 NE MARTIN WAY

[Signed] Roy McGill
(Well Driller)

License No. 0336 Date ....., 19.....

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

File Original and First Copy with Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 061474

Water Right Permit No.

22415 - Betti 3

(1) OWNER: Name Bruns Betti Address 2900 Mallon Road

(2) LOCATION OF WELL: County Thurston SW ¼ SW ¼ Sec 2 T 18 N., R 1W W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) Same

(3) PROPOSED USE: ☒ Domestic ☐ Irrigation ☐ DeWater ☐ Industrial ☐ Test Well ☐ Municipal ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1

Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotery ☒ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches. Drilled 198 feet. Depth of completed well 198 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from +1 ft. to 193 ft.
Welded ☒ Liner installed ☐ Threaded ☐
" Diam. from ft. to ft.
" Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☒ No ☐
Manufacturer's Name WESCO
Type Wire Model No.
Diam. 6 Slot size 14 from 193 ft. to 198 ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name Sears
Type: Sub H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level 200± ft.
Static level 174 ft. below top of well Date 10-91
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test 10-91
Bailer test 12 gal./min. with 0 ft. drawdown after 1 hrs.
Airtest gal./min. with stem set at ft. for hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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 of information.

MATERIAL	FROM	TO
Sandy loam w/ cobbles	0	2
Sand - clay - gravel	2	9
Cemented (above) Hardpan	9	29
Hardpan - grey w/ clay	29	71
Sand - clay - gravel - Brown w/ boulders -	71	107
Hardpan	107	151
Wtr Sand - very fine silty	151	154
Fine Brn. Sand	154	163
Fine grey Sand	163	170
Grey clay	170	174
Sand w/ gravel	174	176
Brown Sand w/ clay	176	188
Brown Sand - water		
Shot w/ gravel -	188	198

Work started 10 19 91 Completed 10 19 91

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.

NAME Tims Well Drilling (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 6246 Libby Rd NE
(Signed) (WELL DRILLER) License No. 0832
Contractor's Registration No. TIMSWD131RE Date 10-28 19 91

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) -1329- 3

File Original with Department of Ecology
Second Copy - Owner's Copy
Third Copy - Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

405357 - City of Lacey - Betti

Notice of Intent W1069926 (Revised)
UNIQUE WELL I.D. # AEC 941
Water Right Permit No. G2-27007

169970

(1) OWNER: Name City of Lacey Address PO Box 3400 Lacey, WA 98509

(2) LOCATION OF WELL: County Thurston NE 1/4 SW 1/4 Sec 2 T 18 N.R. 1 W WM

(2a) STREET ADDRESS OF WELL: (or nearest address) Marvin Rd E. - Lacey

TAX PARCEL NO.:

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☒ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one)
☒ New Well ☐ Deepened ☐ Reconditioned ☐ Decommission
Method: ☐ Dug ☒ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted

(5) DIMENSIONS: Diameter of well 20" inches
Drilled 394 feet. Depth of completed well 392 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 20" Diam. from +2 ft. to 300 ft.
Welded ☒ 16" Diam. from 243.5 ft. to 293.6 ft.
Liner installed ☐ " Diam. from ft. to ft.
Threaded ☐

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☒ No ☐
Manufacturer's Name ALLOY
Type 304 SS Model No.
Diam. 12" Slot size 35 from 293.6 ft. to 309.25 ft.
Diam. 12" Slot size 35 from 332.2 ft. to 347.9 ft.
30 354.9 395

Gravel packed: Yes ☒ No ☐ Size of gravel
Gravel placed from 245 ft. to 392 ft.

Surface seal: ☒ Yes ☐ No To what depth? 80 ft.
Material used in seal bentonite
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name NA
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level 233 ft.
Static level 178 ft. below top of well Date 2/18/05
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? DRILLER; ☐ Other
step test
Yield: 400 gal./min. with 70 ft. drawdown after 12 hrs.
Yield: 800 gal./min. with 140 ft. drawdown after 12 hrs.
Yield: 1200 gal./min. with 666 ft. drawdown after 24 hrs.
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
10 min	173.5	84 min	170.7		
19 min	172.5				
29 min	171.6				

Date of test 2/18/05
Baller test NA gal./min. with ft. drawdown after hrs.
Airtest gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 49.9°F Was a chemical analysis made? ☒ Yes ☐ No

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION
Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered.

MATERIAL	FROM	TO
Topsoil	0	4
Gray Brown silt	4	16
Dense gray clay and gravelly silty sand	16	190
Medium brown silty sand w/occasional gravel	190	306
Brown medium sand w/some gravel	306	312
Brown sandy silt	312	333
Brown medium sand w/silt layers and some gravel	332	357
Brown sand & gravel	357	382
Brown silt & sand	382	394

12/15/04 - 3/22/05

RECEIVED
JUN 21 2005
Washington State
Department of Ecology

Work Started 12/15/04 Completed 3/22/05

WELL CONSTRUCTION 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.

Type or Print Name Dave Charon License No. 1190
(Licensed Driller/Engineer)
Trainee Name NA License No. —
Drilling Company Charon Drilling, Inc
(Signed) Dave Charon License No. 1190
(Licensed Driller/Engineer)
Address 12719-224 St E. Graham, WA 98
Contractor's Registration No. CHARODI133NF Date 4/15/05

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (360) 407-6600. The TDD number is (360) 407-6006.

ECY 050-1-20 (11/98)

27637 - Davis

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....

Permit No. .....

(1) OWNER: Name SHAMROCK TRAILER COURT MARY DAVIS Address 6814 MARTIN WAY OLYMPIA WA.

(2) LOCATION OF WELL: County THURSTON — NW ¼ NE ¼ Sec. 15 T. 18 N., R. 1W W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☒

(4) TYPE OF WORK: Owner's number of well (if more than one) ....

New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 243 ft. Depth of completed well 243 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 5/8 " Diam. from -1 ft. to 233 ft.
Threaded ☐ ..." Diam. from ... ft. to ... ft.
Welded ☒ ..." Diam. from ... ft. to ... ft.

Perforations: Yes ☐ No ☒
Type of perforator used ....
SIZE of perforations ... in. by ... in.
... perforations from ... ft. to ... ft.
... perforations from ... ft. to ... ft.
... perforations from ... ft. to ... ft.

Screens: Yes ☒ No ☐ Manufacturer's Name JOHNSON
Type STAINLESS STEEL Model No. TELESCOPE
Diam. 6 Slot size .060 from 233 ft. to 243 ft.
Diam. ... Slot size ... from ... ft. to ... ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: ....
Gravel placed from ... ft. to ... ft.

Surface seal: Yes ☒ No ☐ To what depth? ... ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes ☒ No ☐
Type of water? FRESH Depth of strata 55 - 180
Method of sealing strata off ....

(7) PUMP: Manufacturer's Name ....
Type: ... H.P. ....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 155 ft. below top of well Date 1-20-88
Artesian pressure ... lbs. per square inch Date ....
Artesian water is controlled by ... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? ....
Yield: ... gal./min. with ... ft. drawdown after ... hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test ....
Bailer test 110 gal./min. with 4 ft. drawdown after 1 hrs.
Artesian flow ... g.p.m. Date ....
Temperature of water .... Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

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 of formation.

MATERIAL	FROM	TO
BROWN SAND + GRAVEL WATER BEARING AT 50'	0	55
BLUE SAND	55	83
LIGHT CHOCKLATE COLOR CLAY WOOD NOT WATER BEARING	83	164
BLUE SAND + GRAVEL WITH A THIN LAYER OF BROWN GRAVEL	164	168
BLUE SAND SOME COARSE SOME SILT LIKE	168	182
BLUE SAND WITH ROCKS	182	224
SAND AND GRAVEL BROWN	224	243+
TRIED TO MAKE A WELL OUT OF THIS HOLE AT 168 PUT IN .060 SCREEN TOO MUCH SAND, OLD SCREEN - NO WATER - PUT A .020 SCREEN IN AT 180' - 10GPM AT 243' PUT IN 10' OF .060 SCREEN WATER MOVES EASILY IN WELL WOULD YIELD MORE THAN 100 GPM		

RECEIVED JAN 29 1988 DEPARTMENT OF ECOLOGY

Work started 11 ..., 19 87 Completed 1-20 ..., 19 88

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME KING BROS DRILLING INC (Person, firm, or corporation) (Type or print)

Address 106 E MAGNOLIA CENT. WA. 98531

[Signed] Edwin C King (Well Driller)

License No. 0243 Date 1-25, 19 88

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

WATER WELL REPORT
STATE OF WASHINGTON

(1) OWNER: Name LAURICELLA ROB Address 1417 HORNE ST NE OLYMPIA, WA 98516-

(2) LOCATION OF WELL: County THURSTON - SW 1/4 NW 1/4 Sec 3 T 18 N., R 1W WM
(2a) STREET ADDRESS OF WELL (or nearest address) 3236 CARPENTER RD NE OLY.

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one)
NEW WELL Method: AIR ROTARY

(5) DIMENSIONS: Diameter of well 06 inches
Drilled 365 ft. Depth of completed well 361 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 06 " Dia. from 0 ft. to 361 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: NO
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to 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? 18 ft.
Material used in seal BENTONITE CLAY
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 126 ft. below top of well Date 04/13/94
Artesian Pressure lbs. per square inch Date / /
Artesian water controlled by

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
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

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test 40 gal/min. w/ stem set at 355 ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? NO

(10) WELL LOG

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.

MATERIAL	FROM	TO
TOPSOIL	0	01
SILTY SAND	1	4
BROWN SILTY SAND AND GRAVEL	4	36
BROWN SILTY SAND SOME GRAVEL	36	60
BROWN SILTY SAND	60	122
GREY SILTY CLAY	122	159
GREY STICKY CLAY	159	360
COARSE SAND GRAVEL WATER	360	365

RECEIVED
'94 MAY 11 AM 8:31

Work started 04/07/94 Completed 04/13/94

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.

NAME RICHARDSON WELL DRILLING
(Person, firm, or corporation) (Type or print)

ADDRESS PO BOX 44427 TAC WA 98444

[SIGNED] _____ License No. 2017

Contractor's Registration No. RICHAW*3210B Date 05/02/94

273373 - Olympia S&G 203549

File Original and First Copy with Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. _____

Water Right Permit No. _____

(1) OWNER: Name OLYMPIA SAND AND GRAVEL Address PO BOX 1517, OLYMPIA

(2) LOCATION OF WELL: County THURSTON NW ¼ NW ¼ Sec 10 T 18 N., R 1W W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) CARPENTER ROAD, OLYMPIA

(3) PROPOSED USE: ☐ Domestic ☐ Irrigation ☐ DeWater ☒ Industrial ☐ Test Well ☐ Municipal ☐ Other

(4) TYPE OF WORK: Owner's number of well (if more than one) UNKNOWN

Abandoned ☐ New well ☒ Deepened ☐ Reconditioned ☐ Method: Dug ☐ Cable ☐ Rotary ☒ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8 inches. Drilled 160 feet. Depth of completed well 157 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8 " Diam. from +3 ft. to 157 ft.
Welded ☒ Liner installed ☐ Threaded ☐ _____ " Diam. from _____ ft. to _____ ft.

Perforations: Yes ☒ No ☐
Type of perforator used HOLT AIR PERF
SIZE of perforations 1/4 in. by 1 in.
270 perforations from 137 ft. to 154 ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes ☐ No ☒
Manufacturer's Name _____
Type _____ Model No _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P _____

(8) WATER LEVELS: Land-surface elevation above mean sea level N/A ft.
Static level 90 ft. below top of well Date 05/01/92
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 40 gal./min. with stem set at 155 ft. for 3 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water N/A Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

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 of information.

MATERIAL	FROM	TO
TOPSOIL	0	2
SAND, GRAVEL, MOIST	2	28
SAND AND GRAVEL W/B	28	41
50 GPM AT 41'		
SAND, GRAVEL, CLAY, MOIST	41	82
SAND, GRAVEL, CLAYEY, MUCKEY	82	145
SAND, GRAVEL, WET	145	154
SAND, GRAVEL, WOOD, SILT	154	160
60 GPM FOR 1 HOUR, AFTER 3 HOURS DROPPED TO 40 GPM		

Work started 4/24/92, 19. Completed 05/01/92, 19

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.

NAME KING BROS. DRILLING INC.
(PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address 644 SHOREY ROAD, CHEHALIS

(Signed) CDK (WELL DRILLER) License No. 0607

Contractor's Registration No. KINGBDI124DC Date 05/03/92, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

479083 - Park

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

Construction/Decommission *("x" in circle)*

261467

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

CURRENT

Notice of Intent No. WE06323

Unique Ecology Well ID Tag No. ALN038

Water Right Permit No. EXEMPT WELL

Property Owner Name PETER & SUNNY PARK

Well Street Address 7945 MARTIN WAY

City OLYMPIA County THURSTON

Location SE 1/4-1/4 SW 1/4 Sec 11 Twn 18N R 1W EWM or WWM ☐ circle ☑ one

Lat/Long (s, t, r Still **REQUIRED**) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 11811341400

PROPOSED USE: ☐ Domestic ☐ Industrial ☐ Municipal ☐ DeWater ☒ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

☑ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☐ Cable ☑ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 220 ft.

Depth of completed well 220 ft.

CONSTRUCTION DETAILS

Casing Installed: ☑ Welded 6 " Diam. from +2 ft. to 220 ft.

☐ Liner installed _____ " Diam. from _____ ft. to _____ ft.

☐ Threaded _____ " Diam. from _____ ft. to _____ ft.

Perforations: ☐ Yes ☑ No

Type of perforator used _____

SIZE of perfs _____ in. by _____ in. and no. of perfs ____ from ____ ft. to ____ ft.

Screens: ☐ Yes ☑ No ☐ K-Pac Location _____

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ☐ Yes ☑ No ☐ Size of gravel/sand _____

Materials placed from _____ ft. to _____ ft.

Surface Seal: ☑ Yes ☐ No To what depth? 20 ft.

Material used in seal BENTONITE CHIPS

Did any strata contain unusable water? ☐ Yes ☑ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.

Static level 168 ft. below top of well Date 4/12/07

Artesian pressure _____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☑ No If yes, by whom? _____

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Airtest 20 gal./min. with stem set at 210 ft. for 1 hrs.

Artesian flow _____ g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? ☐ Yes ☑ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY)

MATERIAL	FROM	TO
BROWN SILT BOUND SAND, GRAVEL	0	22
BROWN SILTY SAND, GRAVEL	22	68
BROWN SILTY CLAY	68	76
BROWN SILTY SAND	76	92
BROWN SILTY CLAY, GRAVEL	92	104
BROWN CLAY	104	122
BROWN SILTY CLAY	122	145
GRAY SILT, SOME GRAVEL	145	151
GRAY SILTY SAND, GRAVEL, WET	151	158
BROWN SILTY CLAY	158	162
GRAY SILT BOUND SAND, GRAVEL	162	171
RED PETE, WET	171	176
GREEN SILT BOUND SAND, GRAVEL	176	192
BROWN SILT, GRAVEL, WET	192	215
COMPACT GRAVEL AND WATER	215	220

RECEIVED

MAY 15 2007

Washington State Department of Ecology

Start Date 4/11/07 Completed Date 4/12/07

WELL CONSTRUCTION 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.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) ED NELSON

Driller/Engineer/Trainee Signature _____

Driller or trainee License No. 1886

Drilling Company ARCADIA DRILLING INC.

Address PO BOX 1790

City, State, Zip SHELTON WA 98584

Contractor's Registration No. ARCADDI098K1 Date 4/12/07

If TRAINEE, Driller's Licensed No. _____

Driller's Signature _____

Ecology is an Equal Opportunity Employer.

ECY 050-1-20 (Rev 3/05)

The Department of Ecology does NOT warranty the Data and/or Information on this Well Report.

23288 - Selness

Well #1

WATER WELL REPORT

STATE OF WASHINGTON

Application No. 027927

Permit No.

The Original and First Copy with
Department of Ecology
Copy — Owner's Copy
Copy — Driller's Copy

(1) OWNER: Name SAINT MARTINS ABBEY Address LACEY, WA 98503

(2) LOCATION OF WELL: County THURSTON NE ¼ SW ¼ Sec. 16 T. 18 N., R. 1W W.M.

Bearing and distance from section or subdivision corner 2500 FEL & 1400'N OF SW COR 16

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 12 inches.
Drilled 194 ft. Depth of completed well 187 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 12 " Diam. from 0 ft. to 172 ft.
Threaded ☐ 10 " Diam. from 162 ft. to 187 ft.
Welded ☐ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☒ No ☐
Manufacturer's Name
Type SS WIRE WOUND Model No.
Diam 10PS Slot size 40 from 168 ft. to 172 ft.
Diam 10PS Slot size 80 from 172 ft. to 182 ft.

Gravel packed: Yes ☐ No ☒ Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name H.P.
Type:

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level 60.0 ft. below top of well Date 8/22/90
Artesian pressure lbs per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level DRILLER
Was a pump test made? Yes ☒ No ☐ If yes, by whom?
Yield: 83 gal./min with 51 ft. drawdown after 1 hrs.
" 121 " " 75.4 " 2 "
" 100 " " 63.5 " 5 "
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min with ft. drawdown after hrs
Artesian flow gpm Date
Temperature of water Was a chemical analysis made? Yes ☒ No ☐

(10) WELL LOG:

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 of formation.

MATERIAL	FROM	TO
BRN COBBLY GRAVEL	0	12
GRAY-BRN CEMENTED GVL	12	38
SLTY SAND & GVL	38	43
SLT, CLAYEY SLT, W/ S & G		
SEAMS BELOW 55	43	77
SAND & GVL, BRN GRAY, W/S	77	92
SLTY SAND, GRAVEL TO MED SND	92	99
SAND LAYERS W/ S & G	99	118
SILT, CLAY, GRAVEL	118	141
SNDY CLAY & SLT	141	150
S & G W/ CLAY LAYERS	150	161
COARSE SND & GVL GRADING		
TO GVL & SND	161	189
GRAVEL & SND W/ CLAY BINDER	189	194
LOG PREPARED BY		
J B NOBLE		
ROBINSON & NOBLE, INC		
GROUND WATER GEOLOGISTS		
12/20/90		

Work started 7-30-90 19.. Completed 8-24-90 19..

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME HOKKAIDO DRILLING & DEVELOPING CORP.
(Person, firm, or corporation) (Type or print)

Address P.O. Box 100 Graham, WA 98338

[Signed] (Well Driller)

License No. 1146 Date 1-2 , 19 91

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Darryl Selness Address 1603 Dunham Rd NE Olympia

(2) LOCATION OF WELL: County Thurston — NW ¼ SE ¼ Sec. 9 T. 18 N., R. 1W W.M.

Bearing and distance from section or subdivision corner ?

(3) PROPOSED USE: Domestic [X] Industrial [ ] Municipal [ ]
Irrigation [ ] Test Well [ ] Other [ ]

(4) TYPE OF WORK: Owner's number of well (if more than one) —
New well [X] Method: Dug [ ] Bored [ ]
Deepened [ ] Cable [ ] Driven [ ]
Reconditioned [ ] Rotary [ ] Jetted [ ]

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 197 ft. Depth of completed well 195 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 185 ft.
Threaded [ ] " Diam. from ft. to ft.
Welded [X] " Diam. from ft. to ft.

Perforations: Yes [ ] No [X]
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes [X] No [ ]
Manufacturer's Name Johnson
Type Stainless Model No.
Diam. 6 Slot size 15 from 185 ft. to 190 ft.
Diam. 6 Slot size 20 from 190 ft. to 195 ft.

Gravel packed: Yes [ ] No [X] Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes [X] No [ ] To what depth? 18 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes [ ] No [X]
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name Webtrol
Type: Sub - Sec. 20 H.P. 1½

(8) WATER LEVELS: Land-surface elevation above mean sea level 140 ft.
Static level 33 ft. below top of well Date 12-5-78
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes [ ] No [X] If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 30 gal./min. with 15 ft. drawdown after 2 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes [ ] No [ ]

(10) WELL LOG:

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 of formation.

MATERIAL	FROM	TO
Brn. Sand and clay	0	18
Fine gray sand - seepage	18	65
Fine gray sand and clay	65	70
Gray sand to Brown Sand	70	73
Water Sand (12 slott) 12 gpm	73	78
Brown sand to clay	78	80
Clay to fine gray sand	80	95
Gray Sand	95	108
Gray sand to Brown sand (10 slott water sand) static 50'	108	113
	113	118
Fine gray sand	118	149
Cemented sand - very tight		
Clay and sand mixture	149	183
Brown water sand - fine	183	185
Water sand (15 slott)	185	190
Water sand (20 slott)	190	195
Gray clay - (PUGGED BACK)	195	197

RECEIVED
MAR - 8 1979
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 11-17, 1978. Completed 11-30, 1978

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME TIMS Well Drilling
(Person, firm, or corporation) (Type or print)

Address 6906 33rd Ave SE Lacey

[Signed] Jim L Mabry
(Well Driller)

License No. 0832 Date 11-30, 1978

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

Appli: 9318
Permit: 8647
Cert. :

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

18/1W/12F
File number

WELL LOG

Record by Driller
Source Driller's Record

Location: State of WASHINGTON
County Thurston
Area
Map
¼ NW ¼ sec. 12 T. 18 N., R. 1 W.E. W

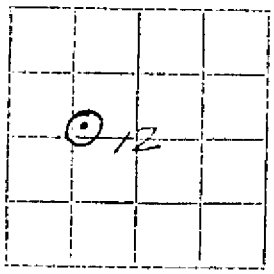


Diagram of Section

Drilling Co. L. R. Gaudio Well Drilling Company
Address 601 Le-Lou-Wa Place NE. Tacoma, 98422
Method of Drilling cable Date December 9, 19 63
Owner Alvin H. Thompson
Address 6507 Martin Way, Olympia, Wn 98501
Land surface, datum 214 ft. above ~~XXXX~~ below
SWL: 185.8 Date December, 1963 Dims. 12 x 390

Corre-lation	Material	From (feet)	To (feet)
	(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)		
	COMMUNITY DOMESTIC		
	Gravel and boulders	0	10
	Hardpan (water 127')	10	127
	Sand & Gravel (water 130-132)	127	132
	Clay and gravel, blue	132	160
	Clay, gravel and sand (& water)	160	228
	Gravel & clay (some water)	228	231
	Hardpan	231	248
	Gravel, cemented (some water) at 268'	248	334
	Clay & gravel (hardpan)	334	350
	Sand (water)	350	352
	Sand & Gravel	352	360
	Silt	360	367
	Gravel (water)	367	368
	Clay & gravel	368	378
	Gravel (water)	378	388

Turn up

Sheet ..... of ..... sheets

272571 - Thompson, cont.

WELL LOG.—Continued No...../.....-.....

CORRELATION	MATERIAL	From (feet)	To (feet)
	Depth forward	388	
	Clay, blue	388	390
	Casing: 12" diam from 0' to 390'		
	Perf. from 311' 380'		
	Seal: Star drive down around 12"		
	Pump: Peerless Vertical turbine pump 10 HP		
	Yield: 500 gpm with 47 DD after 6⅓ hrs.		

S. F. No. 7449—OS—12-65.

428522 - Wargacki

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

Construction/Decommission *("x" in circle)*

(•) Construction

( ) Decommission *ORIGINAL INSTALLATION Notice of Intent Number* 198733

CURRENT
Notice of Intent No. W192293

Unique Ecology Well ID Tag No. ALL311

Water Right Permit No. EXEMPT WELL

Property Owner Name JOSEPH & LORI WARGACKI

Well Street Address 6247 33RD LANE NE

City OLYMPIA County THURSTON

Location SW1/4-1/4 NW1/4 Sec 3 Twn 18N R 1W EWM or WWM (✓) circle one

Lat/Long (s, t, r Still **REQUIRED**) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 11803230800

PROPOSED USE: (✓) Domestic ( ) Industrial ( ) Municipal ( ) DeWater ( ) Irrigation ( ) Test Well ( ) Other _____

TYPE OF WORK: Owner's number of well (if more than one) _____

(✓) New well ( ) Reconditioned *Method:* ( ) Dug ( ) Bored ( ) Driven ( ) Deepened ( ) Cable (✓) Rotary ( ) Jetted

DIMENSIONS: Diameter of well 6 inches, drilled 380 ft.
Depth of completed well 370 ft.

CONSTRUCTION DETAILS

Casing Installed: (✓) Welded 6" Diam. from +2 ft. to 370 ft.
( ) Liner installed _____" Diam. from _____ ft. to _____ ft.
( ) Threaded _____" Diam. from _____ ft. to _____ ft.

Perforations: ( ) Yes (✓) No
Type of perforator used _____
SIZE of perfs _____ in. by _____ in. and no. of perfs _____ from _____ ft. to _____ ft.

Screens: ( ) Yes (✓) No ( ) K-Pac Location _____
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel/Filter packed: ( ) Yes (✓) No ( ) Size of gravel/sand _____
Materials placed from _____ ft. to _____ ft.

Surface Seal: (✓) Yes ( ) No To what depth? 20 ft.
Material used in seal BENTONITE CHIPS
Did any strata contain unusable water? ( ) Yes (✓) No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 89.2 ft. below top of well Date 10/25/06
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ( ) Yes (✓) No If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Airtest 100 gal./min. with stem set at 340 ft. for 1 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? ( ) Yes (✓) No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY:)

MATERIAL	FROM	TO
SILTY GRAVEL, SAND	0	4
SILT BOUND SAND AND GRAVEL	4	16
LOOSE, GRAVEL AND SAND	16	45
GRAY SILT BOUND GRAVEL AND SAND	45	95
GRAY SILT, SOME GRAVEL	95	110
GRAY SILT	110	150
GRAY STICKY CLAY	150	320
GRAY STICKY CLAY, SOME GRAVEL	320	365
GRAVEL, SOME SAND AND WATER	365	375
COARSE BROWN SAND AND WATER	375	380

RECEIVED
NOV 30 2005
Washington State Department of Ecology

Start Date 10/21/05 Completed Date 10/25/05

WELL CONSTRUCTION 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.

( ) Driller ( ) Engineer ( ) Trainee Name (Print) ED NELSON
Driller/Engineer/Trainee Signature _____
Driller or trainee License No. 1886

If TRAINEE,
Driller's Licensed No. _____
Driller's Signature _____

Drilling Company ARCADIA DRILLING INC.
Address PO BOX 1790
City, State, Zip SHELTON WA 98584
Contractor's Registration No. ARCADDI098K1 Date 10/26/05

Ecology is an Equal Opportunity Employer.

273981 - Weston

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. W40761
Water Right Permit No. ABH494

(1) OWNER: Name **WESTON, TIM** Address **2933 JORGENSON ROAD OLYMPIA, WA 98506-**

(2) LOCATION OF WELL: County **THURSTON** - **NW** 1/4 **SW** 1/4 Sec **4** T **18N** N., R **1W** WM

(2a) STREET ADDRESS OF WELL (or nearest address) **JORGENSON ROAD**

(3) PROPOSED USE: **DOMESTIC**

(4) TYPE OF WORK: **NEW WELL** Owner's Number of well (If more than one) **1** Method: **ROTARY**

(5) DIMENSIONS: Drilled **196** ft. Diameter of well **6** inches Depth of completed well **196** ft.

(6) CONSTRUCTION DETAILS:
Casing installed: **6** " Dia. from **+1** ft. to **196** ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: **NO**
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to 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? **20** 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

(7) PUMP: Manufacturer's Name
Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level **23** ft. below top of well Date **10/27/93**
Artesian Pressure lbs. per square inch Date
Artesian water controlled by

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
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

Date of test / /
Bailer test gal/min. ft. drawdown after hrs.
Air test **100** gal/min. w/ stem set at **176** ft. for 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? **NO**

(10) WELL LOG

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.

MATERIAL	FROM	TO
BROWN CLAY	**0**	**22**
BROWN SAND	**22**	**25**
BROWN SAND & GRAVEL	**25**	**29**
BROWN SAND CLAY	**29**	**49**
GRAY SAND CLAY	**49**	**63**
HEAVING GRAY SILTY SAND	**63**	**105**
GRAY SAND CLAY	**105**	**112**
HEAVING GRAY SILTY SAND	**112**	**149**
GRAY SAND CLAY & GRAVEL	**149**	**187**
HEAVING BLACK GRAVEL & WATER	**187**	**196**

Work started **10/26/93** Completed **10/27/93**

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.

NAME **ARCADIA DRILLING INC.**
(Person, firm, or corporation) (Type or print)

ADDRESS **SE 170 WALKER PARK RD**

[SIGNED] License No. **2053**

Contractor's Registration No. **ARCADDIO98K1** Date **10/28/93**

001735011 HDR MW-21

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. RE14423

Construction/Decommission
- [x] Construction
- [ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

Type of Well
- [x] Resource Protection
- [ ] Geotechnical Soil Boring

Consulting Firm HDR

Property Owner Lott
Site Address 7770 Britton LN NE
City Lacey County Thurston

Unique Ecology Well ID
Tag No. MW-21(P) BKX 026

Location ¼ NE ¼ NW Sec 11 Twn 18 R 1 EWM or (WWM)

Lat/Long (s,t,r still Required) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

WELL CONSTRUCTION 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.

Tax Parcel No. _____

- [x] Driller [ ] Trainee Name (Print) Josh Marsh
Driller/Trainee Signature Josh Marsh
Driller/Trainee License No. 3175

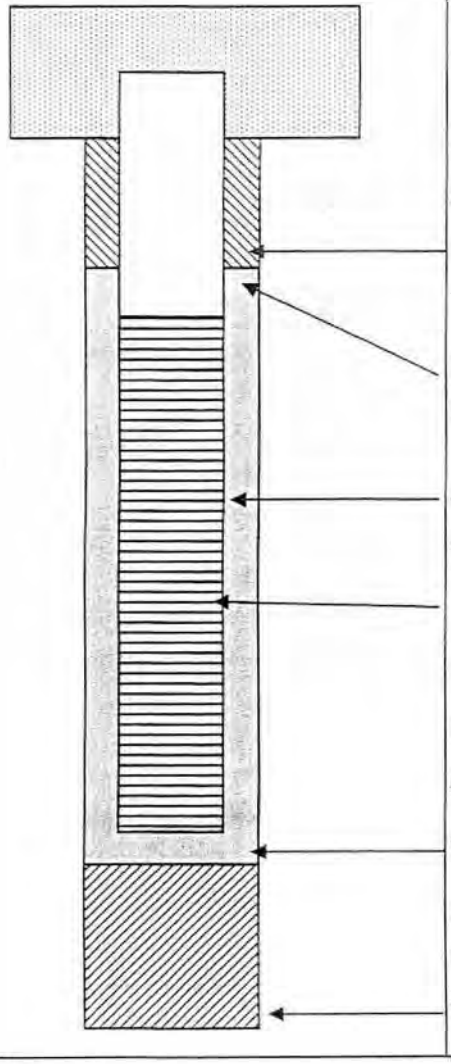
Cased or Uncased Diameter 6" Static Level _____

Work/Decommision Start Date 7-19-17

If trainee, licesned drillers' Signature and License No. _____

Work/Decommision End Date 7-24-17

Construction/Design



Well Data

Concrete Surface Seal Depth	0	FT
Blank Casing (dia x dep)	2.5 INCH	
Material	PVC	
Backfill	5	FT
Type	BENTONITE	
Seal		
Material	BENTONITE	
Gravel Pack	205	FT
Material	10/20 SAND	
Screen (dia x dep)	2.5 INCH	
Slot Size	020	
Material	PVC	
Well Depth	240	FT
Backfill		
Material		
Total Hole Depth	310	FT

Formation Description

0 - 100 FT
SAND, COBBLES

100 - 200 FT
TIGHT SAND & GRAVEL

200 - 310 FT
TIGHT SAND, SILT, GRAVELS CLAY

RECEIVED
MAY 10 2018
WA State Department of Ecology (SWRO)

Scale 1" = _____ Page _____ of _____

ECY 050-12 (Rev. 2/01)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

Boring Log

Project Name	Project No.	Drilling Company
LOTT - Hawks Prairie	10021292	Holt Services, Inc.

Boring No	Location	Drilling Rig Type and Drilling Method
MW-21 (P)	Twin Oaks Rd.	Terra Sonic 150CC, track-mounted sonic

Sample No.	PID Reading (ppm)	Depth (feet)	Completion	Description (USCS)	Elevation (feet)	Remarks
0-10' run			2.5-inch Sch. 80 PVC monitoring well, screened from 220-240 ft bgs. Flush-mount completion.	Wood chips, organic soil.	TOC = 227.16 ft MSL	Drilling with 9-inch casing and 8-inch sampler.
				Medium dense, dry, brown, f-m gravelly sand (SP) with some silt, f-c rounded gravel.		
				Becomes rusty brown at 2'.		Qvr
				Becomes yellowish brown at 4'.		Using straight bit.
		5		Becomes tannish gray at 5'.		
Photo 10'						
10-20' run		10		Medium stiff, dry, brownish gray, low plastic gravelly clay (CL) with trace silt and f-c sand, f-c rounded gravel.		Till.
		15		More sand, less clay.		
Photo 20'						
20-30' run		20		Becomes moist.		
				Medium dense, moist, brownish gray, fine clayey sand (SC).		
		25		Medium dense, dry, brownish gray, fine, poorly graded sand (SP).		
Photo 30'						
30-40' run		30		Medium dense, moist, brownish gray, f-c gravelly sand (SW) with trace clay, f-c rounded gravel, few 3-6-inch rounded cobbles.		Outwash (Qva).
		35				
Photo 40'				Medium dense, moist, brownish gray, f-c sandy rounded gravel (GW) with trace clay, f-c sand, few 3-6-inch cobbles.		

Water Level			Logged By:	Drilled/Sampled By:
While Drilling:	After Drilling:	Hours After:	Adam Kessler	Josh Marsh
132'			Date Started:	Date Completed:
			7/10/2017	7/17/2017

Boring Log

Project Name	Project No.	Drilling Company
LOTT - Hawks Prairie	10021292	Holt Services, Inc.

Boring No	Location	Drilling Rig Type and Drilling Method
MW-21 (P)	Twin Oaks Rd.	Terra Sonic 150CC, track-mounted sonic

Sample No.	PID Reading (ppm)	Depth (feet)	Completion	Description (USCS)	Elevation (feet)	Remarks
40-50' run			2.5-inch Sch. 80 PVC monitoring well, screened from 220-240 ft bgs. Flush-mount completion.	Dense, moist, grayish brown, f-m sand (SP) with some f-c rounded gravel, trace c sand, few 3-6-inch rounded cobbles.		Drilling with 9-inch casing and 8-inch sampler.
				Wet, f-c gravel (GW) lense, trace clay, 42-43'.		
		45		Dense, moist, grayish brown, f-c sandy rounded gravel (GW), f-m sand, few 3-6-inch rounded cobbles.		
Photo 50'						
50-60' run		50				
				Not as wet, moist.		
(Submitted 54-56')		55				
Photo 60'						
60-70' run		60		With trace clay.		
		65		6-inch dry, stiff, gravelly clay lense.		
				Dense, wet, brownish gray, f-c sandy rounded gravel (GW), m-c sand, trace clay, few 3-6-inch rounded cobbles.		Free water in sampler. Perched zone.
Photo 70'		70				
70-80' run						
		75		Sand becomes finer, f-c.		
Photo 80'						

Water Level			Logged By:	Drilled/Sampled By:
			Adam Kessler	Josh Marsh
While Drilling:	After Drilling:	Hours After:	Date Started:	Date Completed:
132'			7/10/2017	7/17/2017

Boring Log

Project Name	Project No.	Drilling Company
LOTT - Hawks Prairie	10021292	Holt Services, Inc.

Boring No	Location	Drilling Rig Type and Drilling Method
MW-21 (P)	Twin Oaks Rd.	Terra Sonic 150CC, track-mounted sonic

Sample No.	PID Reading (ppm)	Depth (feet)	Completion	Description (USCS)	Elevation (feet)	Remarks
80-90' run			2.5-inch Sch. 80 PVC monitoring well, screened from 220-240 ft bgs. Flush-mount completion.	Dense, wet, brownish gray, f-c rounded gravel (GW) with trace coarse sand, trace clay.		Drilling with 9-inch casing and 8-inch sampler.
				Dense, wet, brownish gray, f-c sandy rounded gravel (GW), f-c sand, trace silt and clay.		
		85		4-inch dry, gravelly clay (CL) lense.		
Photo 90'				Less fine sand.		
90-100' run		90				Switch to auger bit; sample fell out.
				Dense, wet, brownish gray, f-c rounded gravel (GW) with some m-c sand, trace silt and clay.		
		95				7/10/17: Drilled 0-100'.
Photo 100'						7/11/17: No water in casing after overnight. Casing at 100'. Tagged wet soil in casing at 94 ft bgs.
100-110' run		100		With few 3-6-inch rounded cobbles.		
		105		Becomes brown, trace medium sand.		
				Dense, dry, brownish gray, f-c clayey rounded gravel (GC), trace f-c sand, few 3-6-inch rounded cobbles.		Dry.
Photo 110'		110		Stiff, dry, light brown, low plastic clay (CL).		
110-120' run				With some f-c rounded gravel below 112.5'.		
		115		Dense, moist, brownish gray, f-c clayey gravel (GC), with some f-c sand, trace silt.		
Photo 120'				Less clay.		

Water Level			Logged By:	Drilled/Sampled By:
			Adam Kessler	Josh Marsh
While Drilling:	After Drilling:	Hours After:	Date Started:	Date Completed:
132'			7/10/2017	7/17/2017

Boring Log

Project Name	Project No.	Drilling Company
LOTT - Hawks Prairie	10021292	Holt Services, Inc.

Boring No	Location	Drilling Rig Type and Drilling Method
MW-21 (P)	Twin Oaks Rd.	Terra Sonic 150CC, track-mounted sonic

Sample No.	PID Reading (ppm)	Depth (feet)	Completion	Description (USCS)	Elevation (feet)	Remarks
120-130' run			2.5-inch Sch. 80 PVC monitoring well, screened from 220-240 ft bgs. Flush-mount completion.	SAME: Dense, moist, brownish gray, f-c clayey gravel (GC), with some f-c sand, trace silt.		Drilling with 9-inch casing and 8-inch sampler.
		125				
				6-inch moist, f-c sand (SW) lense.		
Photo 130'		130				
130-140' run					▽	
				Dense, wet, brownish gray, f-c gravelly sand (SW), f-c rounded gravel.		
		135		4-inch silty sand (SM) lense at 135'.		DTW = 135 ft bgs, casing at 140'.
(Submitted 136-138')				Dense, wet, brownish gray, f-m, poorly graded sand (SP).		
				Dense, wet, brownish gray, f-c sand (SW), with some f-c rounded gravel.		
Photo 140'		140				
140-150' run				Medium stiff, moist, grayish brown, low plastic silt (ML), with some clay.		Confining layer (Qf).
				Low plastic clay (CL) lense with rusty orange iron oxide staining, 142.5-144'.		
				No clay 144-145'.		
		145				
(Submitted 148-150')						
Photo 150'						7/11/17: Set casing in bentonite chips at 150'; bentonite from 147-150'.
		150				
150-160' run						
		155				
Photo 160'						7/11/17: Drilled 100-160'.

Water Level	Logged By:	Drilled/Sampled By:
	Adam Kessler	Josh Marsh

While Drilling:	After Drilling:	Hours After:	Date Started:	Date Completed:
132'			7/10/2017	7/17/2017

Boring Log

Project Name	Project No.	Drilling Company
LOTT - Hawks Prairie	10021292	Holt Services, Inc.

Boring No	Location	Drilling Rig Type and Drilling Method
MW-21 (P)	Twin Oaks Rd.	Terra Sonic 150CC, track-mounted sonic

Sample No.	PID Reading (ppm)	Depth (feet)	Completion	Description (USCS)	Elevation (feet)	Remarks
160-170' run			2.5-inch Sch. 80 PVC monitoring well, screened from 220-240 ft bgs. Flush-mount completion.	SAME: Medium stiff, moist, grayish brown, low plastic silt (ML), with some clay. Some iron oxide staining.		Drilling with 8-inch casing and 7-inch sampler.
		165		Dense, moist, brownish gray, f-m, poorly graded sand (SP), with some silt and clay, trace f-c rounded gravel, few 3-6-inch rounded cobbles.		
				No clay, trace silt.		
		170		No gravel, no cobbles.		
170-180' run				6-inch clayey silt (ML) lense.		
		175		With trace coarse sand.		
Photo 180'						
180-200' run		180		Dense, wet, brownish gray, fine, poorly graded sand (SP), with trace m-c sand, trace silt.		Free water in sample.
		185				
(Submitted 186-188')						
Photo 190'		190		Dense, moist, brownish gray, fine silty sand (SM).		Moist only.
				Stiff, moist, clayey silt (ML) lense, iron oxide staining, trace f-c rounded gravel, 193-194'.		
		195		Dense, wet, brownish gray, f-c sandy gravel (GW), f-c sand, trace silt, some 3-6-inch rounded cobbles.		Wet. Qc aquifer (estimated at 195')
				Becomes moist.		Moist only.
Photo 200'				4-inch clay (CL) lense with iron oxide staining.		

Water Level			Logged By:	Drilled/Sampled By:
			Adam Kessler	Josh Marsh
While Drilling:	After Drilling:	Hours After:	Date Started:	Date Completed:
132'			7/10/2017	7/17/2017

Boring Log

Project Name	Project No.	Drilling Company
LOTT - Hawks Prairie	10021292	Holt Services, Inc.

Boring No	Location	Drilling Rig Type and Drilling Method
MW-21 (P)	Twin Oaks Rd.	Terra Sonic 150CC, track-mounted sonic

Sample No.	PID Reading (ppm)	Depth (feet)	Completion	Description (USCS)	Elevation (feet)	Remarks
200-220' run			2.5-inch Sch. 80 PVC monitoring well, screened from 220-240 ft bgs. Flush-mount completion.	Dense, moist, dark brown, f-c sandy rounded gravel (GW), with some clay, few 3-6-inch rounded cobbles.		Drilling with 8-inch casing and 7-inch sampler.
				Dense, wet, reddish brown, f-c well graded rounded gravel (GW), with trace f-c sand, trace clay, few 3-6-inch cobbles.		
		205		Dense, moist, grayish brown, f-c sandy rounded gravel (GW), f-c sand, with trace silt, trace clay, some iron oxide staining		
				Dense, moist, grayish brown, f-c gravelly sand (SW), f-c rounded gravel, trace silt, trace clay.		
Photo 210'		210		Dense, moist, grayish brown, f-c sandy gravel (GW), f-c sand, some silt, trace clay, few 3-6-inch rounded cobbles.		
		215		Dense, moist, grayish brown, fine silty sand (SM), with trace f-c rounded gravel, few 3-6-inch rounded cobbles. 2-inch stiff, gravelly clay (CL) lense at 217.9'.		
Photo 220'		220		Dense, moist, grayish brown, f-c sandy rounded gravel (GW), f-c sand, with trace silt, trace clay. Becomes wet.		Wet.
220-230' run						
		225		Dense, moist, brown, f-c sand (SW) with some f-c rounded gravel, few 3-6-inch rounded cobbles, trace silt, some iron oxidation.		Moist only.
(Submitted 228-230')				3-inch wet, orangish brown, f-c rounded gravel (GW) lense.		
Photo 230'				Less fines, less fine sand.		
		230		Dense, wet, grayish brown, f-m sand (SW), trace coarse sand,		
230-240' run				Dense, moist, grayish brown, f-m sand (SP), trace f-c rounded gravel, few 3-6-inch rounded cobbles.		
		235				7/12/17: Drilled 160-240', casing set to 240'. 7/13/17: DTW = 159 ft bgs
Photo 240'						

Water Level			Logged By:	Drilled/Sampled By:
			Adam Kessler	Josh Marsh
While Drilling:	After Drilling:	Hours After:	Date Started:	Date Completed:
132'			7/10/2017	7/17/2017

Boring Log

Project Name	Project No.	Drilling Company
LOTT - Hawks Prairie	10021292	Holt Services, Inc.

Boring No	Location	Drilling Rig Type and Drilling Method
MW-21 (P)	Twin Oaks Rd.	Terra Sonic 150CC, track-mounted sonic

Sample No.	PID Reading (ppm)	Depth (feet)	Completion	Description (USCS)	Elevation (feet)	Remarks
240-250' run Sample fell out; retrieved using flapper bit.			2.5-inch Sch. 80 PVC monitoring well, screened from 220-240 ft bgs. Flush-mount completion.	Dense, moist to wet, gray, fine, poorly graded sand (SP), with trace m-c sand, some silt, trace fine rounded gravel. Disturbed sample 240-250'.		Drilling with 8-inch casing and 7-inch sampler. Switch to flapper bit to retrieve sample.
		245				
				No coarse sand, no gravel.		
Photo 250'		250				Switch to auger bit.
250-260' run				F-m sand becomes slightly finer.		Floating/ partitioned sand and muck is up in casing to 211', causing sammpler to jam often. Black wood also found floating on water in casing. Driller is adding water to casing.
				Less silt (trace).		
		255				
Photo 260'		260				
260-270' run Sample fell out; retrieved using flapper bit.				More silt (some). Disturbed sample 260-269'.		Switch to flapper bit to retrieve sample.
		265				
Photo 270'				1' v dense, dry, gray, fine silty sand (SM) lense, trace clay.		7/13/17: Drilled 240-270'. At end of day: pulling casing out to get muck to fall out.
270-280' run		270		Dense, moist, gray, fine, poorly graded sand (SP), with trace m-c sand.		
				Dense, moist, fine silty sand (SM), with ocassional 1-2-inch silt (ML) lenses.		
		275				DTW = 134 ft bgs, casing at 280', sampled to 290'.
Photo 280'						

Water Level			Logged By:	Drilled/Sampled By:
			Adam Kessler	Josh Marsh
While Drilling:	After Drilling:	Hours After:	Date Started:	Date Completed:
132'			7/10/2017	7/17/2017

Boring Log

Project Name	Project No.	Drilling Company
LOTT - Hawks Prairie	10021292	Holt Services, Inc.

Boring No	Location	Drilling Rig Type and Drilling Method
MW-21 (P)	Twin Oaks Rd.	Terra Sonic 150CC, track-mounted sonic

Sample No.	PID Reading (ppm)	Depth (feet)	Completion	Description (USCS)	Elevation (feet)	Remarks
280-290' run			2.5-inch Sch. 80 PVC monitoring well, screened from 220-240 ft bgs. Flush-mount completion.	Dense, moist, gray, fine, poorly graded sand (SP), with some silt, trace m-c sand.		Drilling with 8-inch casing and 7-inch sampler.
				Trace silt.		
		285		1-ft f-c gravelly sand (SW) lense, fine rounded gravel.		
				Trace fine, rounded gravel.		7/14/17: Drilled 270-290', casing at 280' and jammed inside 9-inch casing.
Photo 290'		290				
290-300' run				1-ft f-c gravelly sand (SW) lense, fine rounded gravel.		7/17/17: DTW = 107.5 ft bgs, casing at 280'.
				0.5-inch stiff, brown clay (CL) lense.		
		295				Casing moved ok on 7/17/17.
Photo 300'		300				
300-310' run				3-inch stiff, dry, low plastic clay (CL) lense.		
				6-inch stiff, dry, low plastic silty clay (CL) lense.		
		305		Increasing medium sand, less fine sand (SP), 306-308'.		
				Some silt.		7/17/17: Drilled 290-310', casing to 290'.
Photo 310'		310		Bottom of borehole @ 310', 7/17/17.		
		315				

Water Level			Logged By:	Drilled/Sampled By:
			Adam Kessler	Josh Marsh
While Drilling:	After Drilling:	Hours After:	Date Started:	Date Completed:
132'			7/10/2017	7/17/2017

ATTACHMENT B

NEARBY GROUNDWATER RIGHTS
and
GROUNDWATER RIGHT CERTIFICATE G2-21463

Table B1: Nearby groundwater rights

Groundwater Right Certificate G2-21463

Table B1
Nearby groundwater rights.

Water Right	Purpose	Name	Priority Date	Qi (gpm)	Qa (afy)	Irr. Acres	TRS	¼-¼ / ¼
G2-*03135C	DM	THOMPSON A H	3/31/1953	140	224	0	T18N/R01W-10	SE/SE
G2-*03216C	IR	HAMLIN R J	5/14/1953	16	12	3	T18N/R01W-11	SE/SW
G2-*09253C	CI	Olympia Sand & Gravel Co	3/1/1968	150	121	0	T18N/R01W-10	S2/NW
G2-00079C	DM	WINTON MICHAEL	10/1/1971	125	15	0	T18N/R01W-11	SW/SE
G2-00182C	DM	WELLING GEORGE ETAL	1/14/1972	15	4	0	T18N/R01W-02	SE/SE
G2-00386C	DS	Capitol City Rifle & Skeet Club	1/29/1968	10	2	0	T18N/R01W-02	SE/SE
G2-01092C	DM	JONES GRAHAM ET UX	6/7/1971	40	14	0	T18N/R01W-03	SE/NE
G2-20427C	IR,DM	Hill-Betti Business Park LLC	10/10/1972	115	30.2	16.5	T18N/R01W-03	N2/SE
G2-21463C	**IR**	**North Thurston Life Center**	**9/18/1975**	**20**	**1.5**	**0.75**	**T18N/R01W-11**	**NE/NW**
G2-21478C	DS,CI	LUND LLOYD L	9/25/1973	15	1.5	0	T18N/R01W-11	SW/SE
G2-21793C	DM,FR,IR	WA Natural Resources Dept	1/11/1974	40	6	1	T18N/R01W-11	NE/SE
G2-23768C	DM	Tolmie Cove Associates	3/28/1975	110	29.6	0	T18N/R01W-03	SE/NE
G2-25286C	DM	Clearwater Utilities Inc	7/9/1979	80	30.5	0	T18N/R01W-03	NE/NE
G2-26139C	CI,FR	Ameron Inc	4/27/1982	140	40	0	T18N/R01W-02	NE/SE
G2-26526C	CI	Olympia Cheese Co	4/19/1984	130	84	0	T18N/R01W-02	SW/NE
G2-26621(A)	DM	Washington Water Service	11/28/1984	60	10	0	T18N/R01W-03	SW/NE
G2-26737C	CI	Olympia Cheese Co	7/5/1985	130	27	0	T18N/R01W-02	SW/NE
G2-27007C	DM	Lacey City	8/13/1987	1000	468.3	0	T18N/R01W-02	NW/SW
G2-27286C	CI	Miles Sand and Gravel Co	3/8/1988	60	97	0	T18N/R01W-10	SE/NW
G2-28742C	DS,IR	PAUL SHOBLOM	2/8/1993	200	10.5	5	T18N/R01W-03	
G2-28785C	DS,ST	Shawn and Denise Brownlee	3/2/1993	50	0.65	5	T18N/R01W-03	SW/NW
G2-30249P	MU	LACEY CITY	4/28/2005	1000	600	NULL	T18N/R01W-02	NW/SW

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
SUPERSEDING

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 263, 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
September 18, 1975	G2-21463	G2-21463	G2-21463 CA

NAME
North Thurston Life Center

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
2425 Marvin Road NE	Olympia	Washington	98506-3871

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 WATERS TO BE APPROPRIATED

SOURCE
A well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	20	1.5

QUANTITY, TYPE OF USE, PERIOD OF USE		
1.5 Acre-feet per year	Irrigation (.75 acre)	May 1 to October 1

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL
75 feet south and 300 feet west of the north quarter corner of Section 11.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
E½NE¼NW¼	11	18	1W	13	Thurston

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

That part of the north 388.50 feet of the east half of the northeast quarter of the northwest quarter, Section 11, T. 18 N., R. 1 W.W.M., lying southwesterly of Marvin Road and westerly of a line described as beginning at a point on the east line of said subdivision 29.84 feet south 1"54' west of the northeast corner thereof; thence south 51°55'27" west 112.16 feet; thence along a curve to the left, having a radius of 150 feet, 235.62 feet; thence south 38°04'33" east 98.05 feet to a point on the south line of said north 388.50 feet of said subdivision south 87°54'33" east 620.12 feet from its southwest corner; LESS rights of way.

PROVISIONS

The well access port shall be maintained at all times.

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, WAC 508-64-020 through -040. Meter readings shall be recorded at least monthly.

The Water Resources Act of 1971 specifies certain criteria regarding utilization and management of the waters of the state in the best public interest. Use of water may be subject to regulation at certain times, based on the necessity to maintain water quantities sufficient for preservation of the natural environment.

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 Olympia, Washington,

this 6th *day of* August, *19* 93.

August 6, 1993

Department of Ecology

ENGINEERING DATA
OK VW

by Jane Bloomfield

FOR COUNTY USE ONLY

ATTACHMENT C

CONTAMINATED SITES INVENTORY

Excerpts of EDR (2022): Executive Summary, Overview Map, and Map Findings Summary (all pages describing sites in survey, except only 2 out of 124 pages for Site 8 - Walmart Supercenter).

Quiemuth
Thurston County
Olympia, WA 98516

Inquiry Number: 7133206.2s
September 29, 2022

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION	PAGE
Executive Summary	ES1
Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	8
Orphan Summary	203
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting SSURGO Soil Map	A-5
Physical Setting Source Map	A-30
Physical Setting Source Map Findings	A-32
Physical Setting Source Records Searched	PSGR-1

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E1527-21), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

THURSTON COUNTY
OLYMPIA, WA 98516

COORDINATES

Latitude (North):	47.0652840 - 47ˆ 3' 55.02''
Longitude (West):	122.7757610 - 122ˆ 46' 32.73''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	517027.7
UTM Y (Meters):	5212225.0
Elevation:	226 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	14742670 LACEY, WA
Version Date:	2020

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20150730
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
THURSTON COUNTY
OLYMPIA, WA 98516

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	HAWKS PRAIRIE COMMER	7770 BRITTON PKWY NE	VCP	Higher	1095, 0.207, NNW
A2	HAWKS PRAIRIE COMMER	7770 BRITTON PKWY NE	ALLSITES, CSCSL NFA	Higher	1095, 0.207, NNW
3	LACEY GATEWAY PARCEL	BRITTON PKWY GATEWAY	CSCSL, ALLSITES	Higher	1419, 0.269, West
4	PENSKE TRUCK SPILL M	2527 MARVIN RD NE	CSCSL, ALLSITES, SPILLS	Higher	1696, 0.321, NNE
5	7-ELEVEN 2361 - 3456	2425 MARVIN RD NE	ALLSITES, SPILLS, Financial Assurance	Higher	1703, 0.323, NE
6	EVERGREEN SPORTSMAN	2301 MARVIN RD NE	CSCSL, INST CONTROL, VCP, ALLSITES, MANIFEST	Lower	1769, 0.335, East
7	BRITTON PARKWAY FILL	2535 MARVIN RD NE	ALLSITES	Higher	1810, 0.343, NNE
8	WALMART SUPERCENTER	1401 GALAXY DR NE	RCRA-SQG, ALLSITES, SPILLS, MANIFEST	Higher	1920, 0.364, SSE
B9	PACIFIC PRIDE MARVIN	2135 MARVIN RD NE	HSL, CSCSL, ALLSITES, ASBESTOS, PTAP	Lower	2248, 0.426, East
B10	HAZO DRUM SITE	2420 A HOGUMBAY RD	ALLSITES, RCRA NonGen / NLR	Lower	2277, 0.431, East
11	TEC EQUIPMENT	2800 MARVIN ROAD NE	ALLSITES, NPDES	Higher	2312, 0.438, NNE
B12	HAWKS PRAIRIE MARVIN	MARVIN & HAWKS PRAIR	ALLSITES	Lower	2317, 0.439, East
13	THURSTON CNTY LANDFI	MARVIN RD	ALLSITES, RCRA NonGen / NLR	Lower	2507, 0.475, ESE
14	PENSKE TRUCK LEASING	7647 BETTI LN	ALLSITES	Higher	2510, 0.475, NNW
15	CABELAS STORE 026	1600 GATEWAY BLVD NE	ALLSITES, SPILLS, MANIFEST	Lower	2549, 0.483, WSW
16	TANGLE WILD ARCO	7291 MARTIN WAY E	HSL, CSCSL, LUST, UST, ALLSITES	Lower	4894, 0.927, SSW
17	LACEY URBAN CENTER	7131 - 7239 MARTIN W	CSCSL, VCP, ALLSITES, DRYCLEANERS	Lower	5099, 0.966, SSW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Lists of Federal Delisted NPL sites

Delisted NPL ---------- National Priority List Deletions

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS ---------- Corrective Action Report

Lists of Federal RCRA TSD facilities

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Lists of Federal RCRA generators

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-VSQG ---------- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System

US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROLS..... Institutional Controls Sites List

Federal ERNS list

ERNS..... Emergency Response Notification System

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF..... Solid Waste Facility Database

Lists of state and tribal leaking storage tanks

LUST..... Leaking Underground Storage Tanks Site List
INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

Lists of state and tribal registered storage tanks

FEMA UST..... Underground Storage Tank Listing
UST..... Underground Storage Tank Database
AST..... Aboveground Storage Tank Locations
INDIAN UST..... Underground Storage Tanks on Indian Land

Lists of state and tribal voluntary cleanup sites

INDIAN VCP..... Voluntary Cleanup Priority Listing
ICR..... Independent Cleanup Reports

Lists of state and tribal brownfield sites

BROWNFIELDS..... Brownfields Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

SWTIRE..... Solid Waste Tire Facilities
SWRCY..... Recycling Facility List
INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands
ODI..... Open Dump Inventory
DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL..... Delisted National Clandestine Laboratory Register
CDL..... Clandestine Drug Lab Contaminated Site List
HIST CDL..... List of Sites Contaminated by Clandestine Drug Labs
US CDL..... National Clandestine Laboratory Register
AQUEOUS FOAM..... Firefighting Foam Incidents

PFAS ..... PFAS Contamination Site Location Listing

Local Land Records

LIENS 2 ..... CERCLA Lien Information

Records of Emergency Release Reports

HMIRS ..... Hazardous Materials Information Reporting System
SPILLS ..... Reported Spills
SPILLS 90 ..... SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR ..... RCRA - Non Generators / No Longer Regulated
FUDS ..... Formerly Used Defense Sites
DOD ..... Department of Defense Sites
SCRD DRYCLEANERS ..... State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ..... Financial Assurance Information
EPA WATCH LIST ..... EPA WATCH LIST
2020 COR ACTION ..... 2020 Corrective Action Program List
TSCA ..... Toxic Substances Control Act
TRIS ..... Toxic Chemical Release Inventory System
SSTS ..... Section 7 Tracking Systems
ROD ..... Records Of Decision
RMP ..... Risk Management Plans
RAATS ..... RCRA Administrative Action Tracking System
PRP ..... Potentially Responsible Parties
PADS ..... PCB Activity Database System
ICIS ..... Integrated Compliance Information System
FTTS ..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ..... Material Licensing Tracking System
COAL ASH DOE ..... Steam-Electric Plant Operation Data
COAL ASH EPA ..... Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ..... PCB Transformer Registration Database
RADINFO ..... Radiation Information Database
HIST FTTS ..... FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ..... Incident and Accident Data
CONSENT ..... Superfund (CERCLA) Consent Decrees
INDIAN RESERV ..... Indian Reservations
FUSRAP ..... Formerly Utilized Sites Remedial Action Program
UMTRA ..... Uranium Mill Tailings Sites
LEAD SMELTERS ..... Lead Smelter Sites
US AIRS ..... Aerometric Information Retrieval System Facility Subsystem
US MINES ..... Mines Master Index File
ABANDONED MINES ..... Abandoned Mines
FINDS ..... Facility Index System/Facility Registry System
ECHO ..... Enforcement & Compliance History Information
UXO ..... Unexploded Ordnance Sites
DOCKET HWC ..... Hazardous Waste Compliance Docket Listing
FUELS PROGRAM ..... EPA Fuels Program Registered Listing
AIRS ..... Washington Emissions Data System
ASBESTOS ..... ASBESTOS
COAL ASH ..... Coal Ash Disposal Site Listing

DRYCLEANERS Drycleaner List
Financial Assurance Financial Assurance Information Listing
Inactive Drycleaners Inactive Drycleaners
MANIFEST Hazardous Waste Manifest Data
NPDES Water Quality Permit System Data
UIC Underground Injection Wells Listing
MINES MRDS Mineral Resources Data System

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP EDR Proprietary Manufactured Gas Plants
EDR Hist Auto EDR Exclusive Historical Auto Stations
EDR Hist Cleaner EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS Recovered Government Archive State Hazardous Waste Facilities List
RGA LF Recovered Government Archive Solid Waste Facilities List
RGA LUST Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Lists of state- and tribal (Superfund) equivalent sites

HSL: The Hazardous Sites List is a subset of the CSCSL Report. It includes sites which have been assessed and ranked using the Washington Ranking Method (WARM).

A review of the HSL list, as provided by EDR, and dated 02/23/2022 has revealed that there are 2 HSL sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
PACIFIC PRIDE MARVIN	***2135 MARVIN RD NE***	***E 1/4 - 1/2 (0.426 mi.)***	***B9***	***148***
Facility Type: Hazardous Sites List				

FSID Number: 11334
Facility Status: Cleanup Started

TANGLE WILD ARCO	***7291 MARTIN WAY E***	***SSW 1/2 - 1 (0.927 mi.)***	***16***	***185***

Facility Type: Hazardous Sites List
FSID Number: 75957582
Facility Status: Cleanup Started

Lists of state- and tribal hazardous waste facilities

CSCSL: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Ecology's Confirmed & Suspected Contaminated Sites List.

A review of the CSCSL list, as provided by EDR, and dated 07/11/2022 has revealed that there are 6 CSCSL sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LACEY GATEWAY PARCEL	***BRITTON PKWY GATEWAY***	***W 1/4 - 1/2 (0.269 mi.)***	***3***	***10***

Site Status: Cleanup Started
Clean Up Siteid: 11952
Facility ID: 18563
Soil: Confirmed Above Cleanup Levels
Contaminant Name: Arsenic
Contaminant Name: Lead

PENSKE TRUCK SPILL M	***2527 MARVIN RD NE***	***NNE 1/4 - 1/2 (0.321 mi.)***	***4***	***11***

Site Status: Awaiting Cleanup
Clean Up Siteid: 15551
Facility ID: 85587
Soil: Suspected
Soil: Confirmed Above Cleanup Levels
Ground Water: Suspected
Contaminant Name: Benzene
Contaminant Name: Petroleum-Gasoline

Lower Elevation	Address	Direction / Distance	Map ID	Page
EVERGREEN SPORTSMAN	***2301 MARVIN RD NE***	***E 1/4 - 1/2 (0.335 mi.)***	***6***	***16***

Site Status: Cleanup Started
Clean Up Siteid: 12083
Facility ID: 4144
Soil: Remediated-Above
Soil: Suspected
Contaminant Name: Arsenic
Contaminant Name: Lead
Contaminant Name: Petroleum-Diesel
Contaminant Name: Polycyclic Aromatic Hydrocarbons

PACIFIC PRIDE MARVIN	***2135 MARVIN RD NE***	***E 1/4 - 1/2 (0.426 mi.)***	***B9***	***148***

Site Status: Cleanup Started
Clean Up Siteid: 1284

Facility ID: 11334
Soil: Confirmed Above Cleanup Levels
Ground Water: Confirmed Above Cleanup Levels
Contaminant Name: Benzene
Contaminant Name: Lead
Contaminant Name: Petroleum Products-Unspecified
Contaminant Name: Petroleum-Diesel
Contaminant Name: Petroleum-Gasoline
**Additional key fields are available in the Map Findings section*

TANGLE WILD ARCO	***7291 MARTIN WAY E***	***SSW 1/2 - 1 (0.927 mi.)***	***16***	***185***

Site Status: Cleanup Started
Clean Up Siteid: 6636
Facility ID: 75957582
Soil: Confirmed Above Cleanup Levels
Ground Water: Confirmed Above Cleanup Levels
Contaminant Name: Petroleum Products-Unspecified
Contaminant Name: Petroleum-Other

LACEY URBAN CENTER	***7131 - 7239 MARTIN W***	***SSW 1/2 - 1 (0.966 mi.)***	***17***	***196***

Site Status: Cleanup Started
Clean Up Siteid: 15414
Facility ID: 67913
Soil: Confirmed Above Cleanup Levels
Soil: Suspected
Ground Water: Below Cleanup Levels
Ground Water: Suspected
Contaminant Name: Halogenated Solvents
Contaminant Name: Other Halogenated Organics

State and tribal institutional control / engineering control registries

INST CONTROL: The Environmental Covenants Registry is a list of sites that have implemented institutional controls as part of the remedy. Institutional controls are administrative or legal measures used to prevent activities that may compromise the integrity of a cleanup action. They are meant to prevent exposure to contamination remaining on site. Institutional controls may include environmental covenants (also known as "deed restrictions"), zoning restrictions, public health advisories, or other administrative tools. The most common institutional control is an environmental covenant. Environmental covenants are legal recorded documents that typically limit certain uses of the property, such as: Drilling a water supply well on the property. Disturbing pavement covering contaminated areas. Residential use of the property.

A review of the INST CONTROL list, as provided by EDR, and dated 07/11/2022 has revealed that there is 1 INST CONTROL site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
EVERGREEN SPORTSMAN	***2301 MARVIN RD NE***	***E 1/4 - 1/2 (0.335 mi.)***	***6***	***16***

Facility Site ID: 4144
CS ID: 12083

Lists of state and tribal voluntary cleanup sites

VCP: Sites that have entered either the Voluntary Cleanup Program or its predecessor Independent Remedial Action Program.

A review of the VCP list, as provided by EDR, and dated 07/11/2022 has revealed that there are 2 VCP sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HAWKS PRAIRIE COMMER Cleanup Siteid: 13293 Facility ID: 19900 Date NFA: 2018-02-27 VCP Status: NFA VCP Status: NFA Date NFA: 2018-02-27	7770 BRITTON PKWY NE	NNW 1/8 - 1/4 (0.207 mi.)	A1	8

Lower Elevation	Address	Direction / Distance	Map ID	Page
EVERGREEN SPORTSMAN Cleanup Siteid: 12083 Facility ID: 4144 VCP Status: Cleanup Started VCP Status: Cleanup Started	***2301 MARVIN RD NE***	***E 1/4 - 1/2 (0.335 mi.)***	***6***	***16***

PTAP: A list of sites accepted into the Petroleum Technical Assistance Program. The Petroleum Technical Assistance Program (PTAP) expands the state's ability to respond to the high customer demand to clean up petroleum contaminated sites. Under the PTAP, the Pollution Liability Insurance Agency (PLIA) may provide informal site-specific technical consultations and issue written opinion letters to persons conducting independent remedial actions at qualifying petroleum cleanup sites. PLIA may provide these services under the authority of RCW 70.149.040(9) and the Model Toxics Control Act (MTCA), Chapter 70.149 RCW and Chapter 173-340 WAC.

A review of the PTAP list, as provided by EDR, and dated 05/09/2022 has revealed that there is 1 PTAP site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
PACIFIC PRIDE MARVIN	***2135 MARVIN RD NE***	***E 1/4 - 1/2 (0.426 mi.)***	***B9***	***148***

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Hazardous waste / Contaminated Sites

ALLSITES: Information on facilities and sites of interest to the Department of Ecology.

A review of the ALLSITES list, as provided by EDR, and dated 04/29/2022 has revealed that there are 14 ALLSITES sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
HAWKS PRAIRIE COMMER	***7770 BRITTON PKWY NE***	***NNW 1/8 - 1/4 (0.207 mi.)***	***A2***	***8***

Facility Id: 19900				
LACEY GATEWAY PARCEL Facility Id: 18563	***BRITTON PKWY GATEWAY***	***W 1/4 - 1/2 (0.269 mi.)***	***3***	***10***
PENSKE TRUCK SPILL M Facility Id: 85587	***2527 MARVIN RD NE***	***NNE 1/4 - 1/2 (0.321 mi.)***	***4***	***11***
7-ELEVEN 2361 - 3456 Facility Id: 824	***2425 MARVIN RD NE***	***NE 1/4 - 1/2 (0.323 mi.)***	***5***	***13***
BRITTON PARKWAY FILL Facility Id: 13690	2535 MARVIN RD NE	NNE 1/4 - 1/2 (0.343 mi.)	7	23
WALMART SUPERCENTER Facility Id: 5116761	***1401 GALAXY DR NE***	***SSE 1/4 - 1/2 (0.364 mi.)***	***8***	***24***
TEC EQUIPMENT Facility Id: 81891	***2800 MARVIN ROAD NE***	***NNE 1/4 - 1/2 (0.438 mi.)***	***11***	***168***
PENSKE TRUCK LEASING Facility Id: 76492	7647 BETTI LN	NNW 1/4 - 1/2 (0.475 mi.)	14	174

Lower Elevation	**Address**	**Direction / Distance**	**Map ID**	**Page**
EVERGREEN SPORTSMAN Facility Id: 4144	***2301 MARVIN RD NE***	***E 1/4 - 1/2 (0.335 mi.)***	***6***	***16***
PACIFIC PRIDE MARVIN Facility Id: 11334	***2135 MARVIN RD NE***	***E 1/4 - 1/2 (0.426 mi.)***	***B9***	***148***
HAZO DRUM SITE Facility Id: 25352164	***2420 A HOGUMBAY RD***	***E 1/4 - 1/2 (0.431 mi.)***	***B10***	***161***
HAWKS PRAIRIE MARVIN Facility Id: 74423195	MARVIN & HAWKS PRAIR	E 1/4 - 1/2 (0.439 mi.)	B12	169
THURSTON CNTY LANDFI Facility Id: 12979222	***MARVIN RD***	***ESE 1/4 - 1/2 (0.475 mi.)***	***13***	***170***
CABELAS STORE 026 Facility Id: 15034	***1600 GATEWAY BLVD NE***	***WSW 1/4 - 1/2 (0.483 mi.)***	***15***	***175***

CSCSL NFA: The data set contains information about sites previously on the Confirmed and Suspected Contaminated Sites list that have received a No Further Action (NFA) determination. Because it is necessary to maintain historical records of sites that have been investigated and cleaned up, sites are not deleted from the database when cleanup activities are completed. Instead a No Further Action code is entered based upon the type of NFA determination the site received.

A review of the CSCSL NFA list, as provided by EDR, and dated 07/11/2022 has revealed that there is 1 CSCSL NFA site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	**Address**	**Direction / Distance**	**Map ID**	**Page**
HAWKS PRAIRIE COMMER CS Id: 13293 Facility/Site Id: 19900 Soil: Remediated-Below Soil: Below Cleanup Levels NFA Date: 02/27/2018 Contaminant Name: Arsenic	***7770 BRITTON PKWY NE***	***NNW 1/8 - 1/4 (0.207 mi.)***	***A2***	***8***

EXECUTIVE SUMMARY

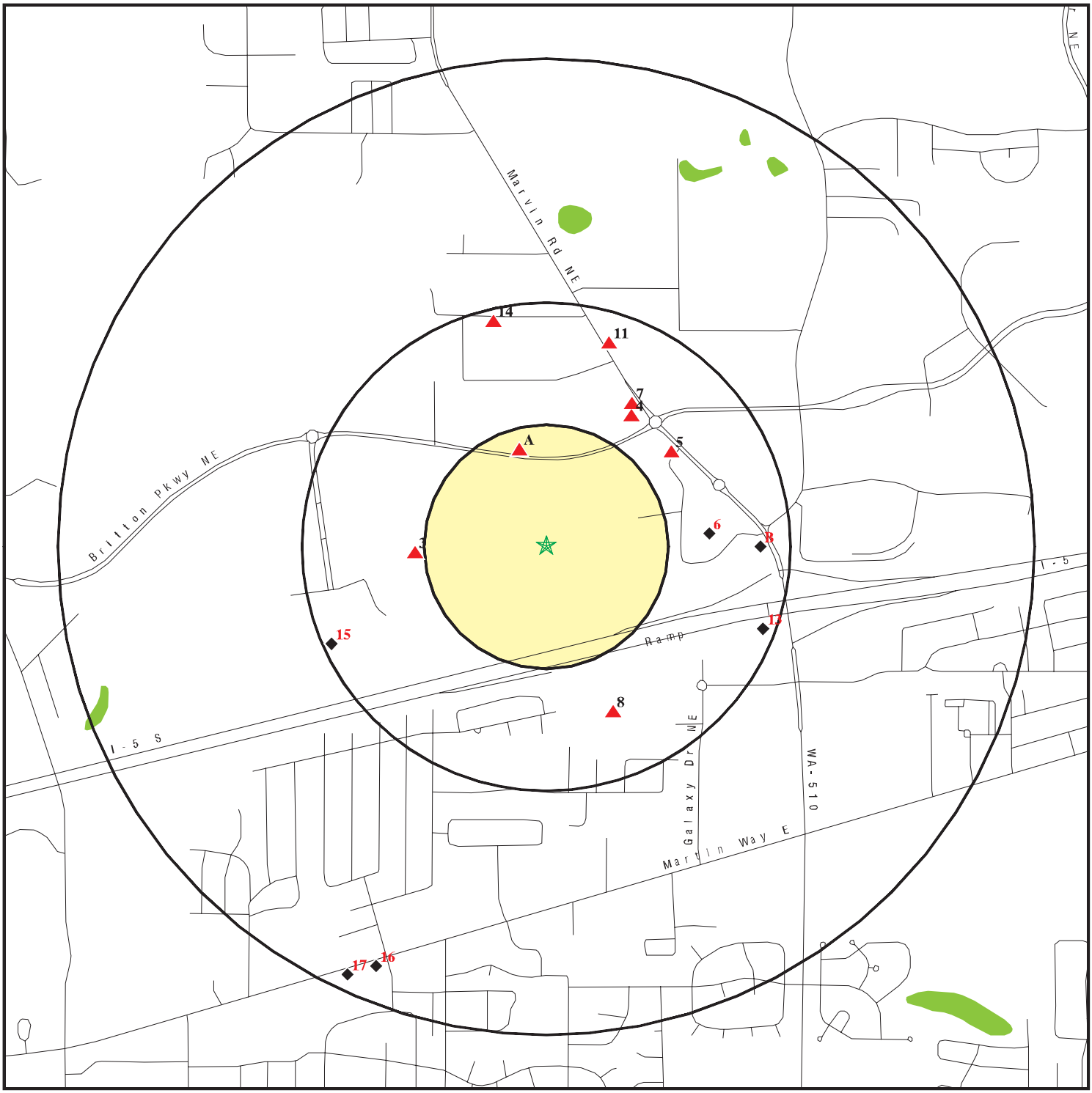
Contaminant Name: Lead

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 9 records.

Site Name	Database(s)
TACOMA SMELTER PLUME THURSTON COUN	CSCSL, ALLSITES
UNOCAL #6405	ICR
MERIDIAN CAMPUS CAMPUS GLEN	CSCSL NFA
LACEY GATEWAY	VCP
JENAMAR PROPERTY PARCEL 1192641010	VCP
MERIDIAN CAMPUS CAMPUS WILLOWS	VCP
MERIDIAN CAMPUS	VCP
MERIDIAN CAMPUS CAMPUS GLEN	VCP
HOGUM BAY LOGISTICS CENTER	VCP

OVERVIEW MAP - 7133206.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Quiemuth	CLIENT:	Coho Water Resources
ADDRESS:	Thurston County Olympia WA 98516	CONTACT:	Chris Pitre
		INQUIRY #:	7133206.2s
LAT/LONG:	47.065284 / 122.775761	DATE:	September 29, 2022 1:08 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Lists of Federal NPL (Superfund) sites								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Lists of Federal Delisted NPL sites								
Delisted NPL	1.000		0	0	0	0	NR	0
Lists of Federal sites subject to CERCLA removals and CERCLA orders								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Lists of Federal CERCLA sites with NFRAP								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA facilities undergoing Corrective Action								
CORRACTS	1.000		0	0	0	0	NR	0
Lists of Federal RCRA TSD facilities								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA generators								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
Lists of state- and tribal (Superfund) equivalent sites								
HSL	1.000		0	0	1	1	NR	2
Lists of state- and tribal hazardous waste facilities								
CSCSL	1.000		0	0	4	2	NR	6
Lists of state and tribal landfills and solid waste disposal facilities								
SWF/LF	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
Lists of state and tribal leaking storage tanks								
LUST	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
Lists of state and tribal registered storage tanks								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
INST CONTROL	0.500		0	0	1	NR	NR	1
Lists of state and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
ICR	0.500		0	0	0	NR	NR	0
VCP	0.500		0	1	1	NR	NR	2
PTAP	0.500		0	0	1	NR	NR	1
Lists of state and tribal brownfield sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
SWTIRE	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
ALLSITES	0.500		0	1	13	NR	NR	14
CDL	TP		NR	NR	NR	NR	NR	0
HIST CDL	TP		NR	NR	NR	NR	NR	0
CSCSL NFA	0.500		0	1	0	NR	NR	1
US CDL	TP		NR	NR	NR	NR	NR	0
AQUEOUS FOAM	0.500		0	0	0	NR	NR	0
PFAS	0.500		0	0	0	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
SPILLS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
AIRS	TP		NR	NR	NR	NR	NR	0
ASBESTOS	TP		NR	NR	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
Inactive Drycleaners	0.250		0	0	NR	NR	NR	0
MANIFEST	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
NPDES	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
MINES MRDS	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA HWS	TP		NR	NR	NR	NR	NR	0
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		0	0	3	21	3	0	27

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 **HAWKS PRAIRIE COMMERCIAL PARCEL (THE HICKORY)** **VCP** **S124433024**
NNW **7770 BRITTON PKWY NE** **N/A**
1/8-1/4 **OLYMPIA, WA 98506**
0.207 mi.
1095 ft. **Site 1 of 2 in cluster A**

Relative:
Higher

Actual:
230 ft.

VCP:

Name:	HAWKS PRAIRIE COMMERCIAL PARCEL (THE HICKORY)
Address:	7770 BRITTON PKWY NE
City,State,Zip:	OLYMPIA, WA 98506
edr_fstat:	WA
edr_fzip:	98506
edr_fcnty:	THURSTON
edr_zip:	Not reported
Facility ID:	19900
VCP Status:	NFA
Past VCP:	Not reported
Current VCP:	Not reported
NFA Type:	OLYMPIA, WA 98506
Date NFA:	OLYMPIA, WA 98506
Rank:	OLYMPIA, WA 98506
Cleanup Siteid:	13293
Contaminant Name:	Arsenic
Soil:	Remediated-Below
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/13293

Name:	HAWKS PRAIRIE COMMERCIAL PARCEL (THE HICKORY)
Address:	7770 BRITTON PKWY NE
City,State,Zip:	OLYMPIA, WA 98506
edr_fstat:	WA
edr_fzip:	98506
edr_fcnty:	THURSTON
edr_zip:	Not reported
Facility ID:	19900
VCP Status:	NFA
Past VCP:	Not reported
Current VCP:	Not reported
NFA Type:	OLYMPIA, WA 98506
Date NFA:	OLYMPIA, WA 98506
Rank:	OLYMPIA, WA 98506
Cleanup Siteid:	13293
Contaminant Name:	Lead
Soil:	Below Cleanup Levels
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/13293

A2 **HAWKS PRAIRIE COMMERICAL PARCEL THE HICKORY** **ALLSITES** **S120845899**
NNW **7770 BRITTON PKWY NE** **CSCSL NFA** **N/A**
1/8-1/4 **OLYMPIA, WA 98506**
0.207 mi.
1095 ft. **Site 2 of 2 in cluster A**

Relative:
Higher

Actual:
230 ft.

ALLSITES:

Name:	HAWKS PRAIRIE COMMERICAL PARCEL THE HICKORY
Facility Id:	19900

Interaction:	122675
Interaction 1:	I
Interaction 2:	VOLCLNST
Ecology Program:	TOXICS
Program Data:	ISIS

HAWKS PRAIRIE COMMERICAL PARCEL THE HICKORY (Continued) **S120845899**

Facility Alt.:	Hawks Prairie Commerical Parcel (The Hickory)
Program ID:	SW1594
Date Interaction:	2017-06-21 00:00:00
Date Interaction 3:	Voluntary Cleanup Sites
Latitude:	47.068735375099997
Longitude:	-122.775860053

CSCSL NFA:

Name:	HAWKS PRAIRIE COMMERCIAL PARCEL (THE HICKORY)
Address:	7770 BRITTON PKWY NE
City,State,Zip:	OLYMPIA, WA 98506
Facility/Site Id:	19900
CS Id:	13293
NFA Date:	02/27/2018
Alternate Site Names:	Hawks Prairie Commerical Parcel (The Hickory),Hawks Prairie Commerical Parcel The Hickory
NFA Reason:	Voluntary Cleanup Program Review
Site Status:	NFA
Region:	Southwest
Contaminant Name:	Arsenic
Ground Water:	Not reported
Surface Water:	Not reported
Soil:	Remediated-Below
Sediment:	Not reported
Air:	Not reported
Bedrock:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/13293
Latitude:	47.068741527
Longitude:	-122.77587376

Name:	HAWKS PRAIRIE COMMERCIAL PARCEL (THE HICKORY)
Address:	7770 BRITTON PKWY NE
City,State,Zip:	OLYMPIA, WA 98506
Facility/Site Id:	19900
CS Id:	13293
NFA Date:	02/27/2018
Alternate Site Names:	Hawks Prairie Commerical Parcel (The Hickory),Hawks Prairie Commerical Parcel The Hickory
NFA Reason:	Voluntary Cleanup Program Review
Site Status:	NFA
Region:	Southwest
Contaminant Name:	Lead
Ground Water:	Not reported
Surface Water:	Not reported
Soil:	Below Cleanup Levels
Sediment:	Not reported
Air:	Not reported
Bedrock:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/13293
Latitude:	47.068741527
Longitude:	-122.77587376

3
West
1/4-1/2
0.269 mi.
1419 ft.

LACEY GATEWAY PARCEL A
BRITTON PKWY GATEWAY BLVD CALLISON RD
LACEY, WA 98503

CSCSL
ALLSITES

S112088289
N/A

Relative:
Higher

Actual:
249 ft.

CSCSL:

Name:	LACEY GATEWAY
Address:	BRITTON PKWY GATEWAY BLVD CALLISON RD
City,State,Zip:	LACEY, WA 98503
Facility ID:	18563
Region:	Southwest
Lat/Long:	47.06513 / -122.78145972
Clean Up Siteid:	11952
Site Status:	Cleanup Started
Contaminant Name:	Arsenic
Alternate Site Names:	LACEY GATEWAY - PARCEL A,LACEY GATEWAY PARCEL A
Site Rank:	Not reported
Has Institutional Control:	Not reported
Past VCP:	TRUE
Current VCP:	TRUE
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/11952
Ground Water:	Not reported
Surface Water:	Not reported
Soil:	Confirmed Above Cleanup Levels
Sediment:	Not reported
Air:	Not reported
Bedrock:	Not reported
Responsible Unit:	Southwest

Name:	LACEY GATEWAY
Address:	BRITTON PKWY GATEWAY BLVD CALLISON RD
City,State,Zip:	LACEY, WA 98503
Facility ID:	18563
Region:	Southwest
Lat/Long:	47.06513 / -122.78145972
Clean Up Siteid:	11952
Site Status:	Cleanup Started
Contaminant Name:	Lead
Alternate Site Names:	LACEY GATEWAY - PARCEL A,LACEY GATEWAY PARCEL A
Site Rank:	Not reported
Has Institutional Control:	Not reported
Past VCP:	TRUE
Current VCP:	TRUE
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/11952
Ground Water:	Not reported
Surface Water:	Not reported
Soil:	Confirmed Above Cleanup Levels
Sediment:	Not reported
Air:	Not reported
Bedrock:	Not reported
Responsible Unit:	Southwest

ALLSITES:

Name:	LACEY GATEWAY PARCEL A
Facility Id:	18563
Interaction:	102383
Interaction 1:	A

LACEY GATEWAY PARCEL A (Continued) **S112088289**

Interaction 2:	VOLCLNST
Ecology Program:	TOXICS
Program Data:	ISIS
Facility Alt.:	LACEY GATEWAY - PARCEL A
Program ID:	SW1244
Date Interaction:	2012-08-17 00:00:00
Date Interaction 3:	Voluntary Cleanup Sites
Latitude:	47.065125000099997
Longitude:	-122.781448056

---

4 **PENSKE TRUCK SPILL MARVIN RD NE** **CSCSL** **S127326918**
NNE **2527 MARVIN RD NE** **ALLSITES** **N/A**
1/4-1/2 **LACEY, WA 98516** **SPILLS**
0.321 mi.
1696 ft.

Relative:
Higher

Actual:
232 ft.

CSCSL:

Name:	PENSKE TRUCK SPILL MARVIN RD NE
Address:	2527 MARVIN RD NE
City,State,Zip:	LACEY, WA 98516
Facility ID:	85587
Region:	Southwest
Lat/Long:	47.06921 / -122.77205
Clean Up Siteid:	15551
Site Status:	Awaiting Cleanup
Contaminant Name:	Benzene
Alternate Site Names:	Not reported
Site Rank:	Not reported
Has Institutional Control:	Not reported
Past VCP:	Not reported
Current VCP:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/15551
Ground Water:	Suspected
Surface Water:	Not reported
Soil:	Suspected
Sediment:	Not reported
Air:	Not reported
Bedrock:	Not reported
Responsible Unit:	Southwest

Name:	PENSKE TRUCK SPILL MARVIN RD NE
Address:	2527 MARVIN RD NE
City,State,Zip:	LACEY, WA 98516
Facility ID:	85587
Region:	Southwest
Lat/Long:	47.06921 / -122.77205
Clean Up Siteid:	15551
Site Status:	Awaiting Cleanup
Contaminant Name:	Petroleum-Gasoline
Alternate Site Names:	Not reported
Site Rank:	Not reported
Has Institutional Control:	Not reported
Past VCP:	Not reported
Current VCP:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/15551
Ground Water:	Suspected
Surface Water:	Not reported

PENSKE TRUCK SPILL MARVIN RD NE (Continued) **S127326918**

Soil: Confirmed Above Cleanup Levels
Sediment: Not reported
Air: Not reported
Bedrock: Not reported
Responsible Unit: Southwest

ALLSITES:
Name: PENSKE TRUCK SPILL MARVIN RD NE
Facility Id: 85587

Interaction: 143664
Interaction 1: A
Interaction 2: SCS
Ecology Program: TOXICS
Program Data: ISIS
Facility Alt.: Penske Truck Spill Marvin Rd NE
Program ID: Not reported
Date Interaction: 2021-12-16 00:00:00
Date Interaction 3: State Cleanup Site
Latitude: 47.069205907600001
Longitude: -122.772025881

SPILLS:
Name: Not reported
Address: 2527 MARVIN RD NE
City,State,Zip: LACEY, WA 98516
Facility ID: 115931
Medium: Infiltration Trench
Material Desc: GASOLINE
Material Qty: 10
Material Units: Gals
Incident Date: 03/25/2021
Incident Category Type: Oil Spill
Incident Category: Oil Spill
Latitude: 47.06921
Longitude: -122.77205
Source Type: Vehicle
Source: Commercial Truck
Vessel Facility Name2: Not reported
Recovered Quantity: Not reported
Resp Party Contact: James McEwan
Cause: Penske Rental Truck Gasoline Spill to Asphalt and Soil, Lacey - 3/25/21
Cause Type: Not reported
Resp Party Name: Penske
Medium Type: Land
Contributing Factors: SABOTAGE/SUSPECTED ILLEGAL ACTIVITY

SPILLS ERTS:
Facility Site ID: Not reported
Name: Not reported
Address: 2527 MARVIN RD NE
City,State,Zip: LACEY, WA 98516
Program Name: Toxics Cleanup
Incident ID: 705700
Incident Status: Follow-up assigned

PENSKE TRUCK SPILL MARVIN RD NE (Continued) **S127326918**

Incident Date:	03/25/2021
Initial Report Activity Name:	Other
Initial Report Cause Category:	Not reported
Initial Report Cause Name:	Not reported
Initial Report Medium Name:	Infiltration trench
Initial Report Medium Category:	Water
Initial Report Source Name:	Commercial truck
Initial Report Source Category:	Vehicle
Initial Report Substance Name:	Unknown
Initial Report Substance Category:	Oil
Initial Report Substance Quantity:	25
Initial Report Substance Unit Of Measure:	U.S. gallons
Potentially Responsible Party First Name:	James
Potentially Responsible Party Last Name:	McEwan
Potentially Responsible Party Organization:	Penske
External Reference Number:	Not reported
Latitude:	47.069209999999998
Longitude:	-122.77204999999999

Facility Site ID:	Not reported
Name:	Not reported
Address:	2527 MARVIN RD NE
City,State,Zip:	LACEY, WA 98516
Program Name:	Spill Prevention, Preparedness & Response
Incident ID:	705700
Incident Status:	Follow-up assigned
Incident Date:	03/25/2021
Initial Report Activity Name:	Other
Initial Report Cause Category:	Not reported
Initial Report Cause Name:	Not reported
Initial Report Medium Name:	Infiltration trench
Initial Report Medium Category:	Water
Initial Report Source Name:	Commercial truck
Initial Report Source Category:	Vehicle
Initial Report Substance Name:	Unknown
Initial Report Substance Category:	Oil
Initial Report Substance Quantity:	25
Initial Report Substance Unit Of Measure:	U.S. gallons
Potentially Responsible Party First Name:	James
Potentially Responsible Party Last Name:	McEwan
Potentially Responsible Party Organization:	Penske
External Reference Number:	Not reported
Latitude:	47.069209999999998
Longitude:	-122.77204999999999

---

5 **7-ELEVEN 2361 - 34563H** **ALLSITES** **S111161512**
NE **2425 MARVIN RD NE** **SPILLS** **N/A**
1/4-1/2 **LACEY, WA 98516** **Financial Assurance**
0.323 mi.
1703 ft.

Relative:
Higher

Actual:
227 ft.

ALLSITES:

Name:	7 ELEVEN 2361
Facility Id:	824
Interaction:	97469
Interaction 1:	A
Interaction 2:	UST

7-ELEVEN 2361 - 34563H (Continued) **S111161512**

Ecology Program:	TOXICS
Program Data:	UST
Facility Alt.:	7-Eleven 2361-34563H
Program ID:	619805
Date Interaction:	2011-08-17 00:00:00
Date Interaction 3:	Underground Storage Tank
Latitude:	47.068011559600002
Longitude:	-122.770690863

SPILLS:

Name:	11-JUL
Address:	2425 MARVIN RD NE
City,State,Zip:	LACEY, WA
Facility ID:	56683
Medium:	Impermeable Containment
Material Desc:	GASOLINE
Material Qty:	1
Material Units:	Gals
Incident Date:	02/07/2012
Incident Category Type:	Oil Spill
Incident Category:	Oil Spill
Latitude:	47.06829
Longitude:	-122.76994
Source Type:	Vehicle
Source:	Non-commercial vehicle
Vessel Facility Name2:	Not reported
Recovered Quantity:	1
Resp Party Contact:	Not reported
Cause:	ERTS# 631897 - 02/07/2012
Cause Type:	Not reported
Resp Party Name:	Not reported
Medium Type:	Impermeable surface
Contributing Factors:	Not reported

SPILLS ERTS:

Facility Site ID:	Not reported
Name:	11-JUL
Address:	2425 MARVIN RD NE
City,State,Zip:	LACEY, WA
Program Name:	Spill Prevention, Preparedness & Response
Incident ID:	631897
Incident Status:	Historic
Incident Date:	02/07/2012
Initial Report Activity Name:	Unknown
Initial Report Cause Category:	Not reported
Initial Report Cause Name:	Not reported
Initial Report Medium Name:	Impermeable containment
Initial Report Medium Category:	Impermeable surface
Initial Report Source Name:	Non-commercial vehicle
Initial Report Source Category:	Vehicle
Initial Report Substance Name:	Gasoline
Initial Report Substance Category:	Oil
Initial Report Substance Quantity:	10
Initial Report Substance Unit Of Measure:	U.S. gallons
Potentially Responsible Party First Name:	Not reported

7-ELEVEN 2361 - 34563H (Continued) **S111161512**

Potentially Responsible Party Last Name: Not reported
Potentially Responsible Party Organization: Not reported
External Reference Number: Not reported
Latitude: 47.068289999999998
Longitude: 122.76994000000001

WA Financial Assurance 1:
Name: 7-ELEVEN 2361 - 34563H
Address: 2425 MARVIN RD NE
City,State,Zip: LACEY, WA 98516
DOE Site ID: 619805
Financial Resp Type: IRONSHORE SPECIALTY INSURANCE COMPANY
Inception Date: 12/18/2012
Expiration Date: 12/18/2014
Address 2: Not reported
Policy Number: 1235401
Effective Date: 12/18/2013
Liability Limit Type: Not reported
Compliance Method: Not reported
Proof of Responsibility Document Flag: Not reported
Retroactive Date: Not reported
Latitude: 47.068016384
Longitude: -122.77071951

Name: 7-ELEVEN 2361 - 34563H
Address: 2425 MARVIN RD NE
City,State,Zip: LACEY, WA 98516
DOE Site ID: 619805
Financial Resp Type: IRONSHORE SPECIALTY INSURANCE CO
Inception Date: 12/18/2014
Expiration Date: 12/18/2015
Address 2: Not reported
Policy Number: 1235401
Effective Date: 12/18/2014
Liability Limit Type: Not reported
Compliance Method: Not reported
Proof of Responsibility Document Flag: Not reported
Retroactive Date: Not reported
Latitude: 47.068016384
Longitude: -122.77071951

Name: 7-ELEVEN 2361 - 34563H
Address: 2425 MARVIN RD NE
City,State,Zip: LACEY, WA 98516
DOE Site ID: 619805
Financial Resp Type: IRONSHORE SPECIALTY INSURANCE CO
Inception Date: 12/18/2019
Expiration Date: 12/18/2020
Address 2: Not reported
Policy Number: 1235402
Effective Date: 12/18/2019
Liability Limit Type: Not reported
Compliance Method: Not reported
Proof of Responsibility Document Flag: Not reported
Retroactive Date: Not reported
Latitude: 47.068016384
Longitude: -122.77071951

7-ELEVEN 2361 - 34563H (Continued) **S111161512**

Name:	7-ELEVEN 2361 - 34563H
Address:	2425 MARVIN RD NE
City,State,Zip:	LACEY, WA 98516
DOE Site ID:	619805
Financial Resp Type:	IRONSHORE SPECIALTY INSURANCE CO
Inception Date:	12/18/2020
Expiration Date:	12/18/2021
Address 2:	Not reported
Policy Number:	ISPILLSB5FGE001
Effective Date:	12/18/2020
Liability Limit Type:	Not reported
Compliance Method:	Not reported
Proof of Responsibility Document Flag:	Not reported
Retroactive Date:	Not reported
Latitude:	47.068016384
Longitude:	-122.77071951

---

6 **EVERGREEN SPORTSMAN CLUB FORMER** **CSCSL** **S113230273**
East **2301 MARVIN RD NE** **INST CONTROL** **N/A**
1/4-1/2 **LACEY, WA 98516** **VCP**
0.335 mi. **ALLSITES**
1769 ft. **MANIFEST**

Relative: **Lower**
Actual: **221 ft.**

CSCSL:

Name:	EVERGREEN SPORTSMAN CLUB EAST
Address:	2301 MARVIN RD NE
City,State,Zip:	LACEY, WA 98516
Facility ID:	4144
Region:	Southwest
Lat/Long:	47.065737 / -122.768676
Clean Up Siteid:	12083
Site Status:	Cleanup Started
Contaminant Name:	Arsenic
Alternate Site Names:	EVERGREEN SPORTSMAN CLUB FORMER,Wig Properties LLC Nisqually
Site Rank:	Not reported
Has Institutional Control:	TRUE
Past VCP:	TRUE
Current VCP:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/12083
Ground Water:	Not reported
Surface Water:	Not reported
Soil:	Remediated-Above
Sediment:	Not reported
Air:	Not reported
Bedrock:	Not reported
Responsible Unit:	Southwest

Name:	EVERGREEN SPORTSMAN CLUB EAST
Address:	2301 MARVIN RD NE
City,State,Zip:	LACEY, WA 98516
Facility ID:	4144
Region:	Southwest
Lat/Long:	47.065737 / -122.768676
Clean Up Siteid:	12083
Site Status:	Cleanup Started
Contaminant Name:	Lead
Alternate Site Names:	EVERGREEN SPORTSMAN CLUB FORMER,Wig Properties LLC Nisqually
Site Rank:	Not reported

EVERGREEN SPORTSMAN CLUB FORMER (Continued) **S113230273**

Has Institutional Control: TRUE
Past VCP: TRUE
Current VCP: Not reported
URL: https://apps.ecology.wa.gov/cleanupsearch/site/12083
Ground Water: Not reported
Surface Water: Not reported
Soil: Remediated-Above
Sediment: Not reported
Air: Not reported
Bedrock: Not reported
Responsible Unit: Southwest

Name: EVERGREEN SPORTSMAN CLUB EAST
Address: 2301 MARVIN RD NE
City,State,Zip: LACEY, WA 98516
Facility ID: 4144
Region: Southwest
Lat/Long: 47.065737 / -122.768676
Clean Up Siteid: 12083
Site Status: Cleanup Started
Contaminant Name: Petroleum-Diesel
Alternate Site Names: EVERGREEN SPORTSMAN CLUB FORMER,Wig Properties LLC Nisqually
Site Rank: Not reported
Has Institutional Control: TRUE
Past VCP: TRUE
Current VCP: Not reported
URL: https://apps.ecology.wa.gov/cleanupsearch/site/12083
Ground Water: Not reported
Surface Water: Not reported
Soil: Remediated-Above
Sediment: Not reported
Air: Not reported
Bedrock: Not reported
Responsible Unit: Southwest

Name: EVERGREEN SPORTSMAN CLUB EAST
Address: 2301 MARVIN RD NE
City,State,Zip: LACEY, WA 98516
Facility ID: 4144
Region: Southwest
Lat/Long: 47.065737 / -122.768676
Clean Up Siteid: 12083
Site Status: Cleanup Started
Contaminant Name: Polycyclic Aromatic Hydrocarbons
Alternate Site Names: EVERGREEN SPORTSMAN CLUB FORMER,Wig Properties LLC Nisqually
Site Rank: Not reported
Has Institutional Control: TRUE
Past VCP: TRUE
Current VCP: Not reported
URL: https://apps.ecology.wa.gov/cleanupsearch/site/12083
Ground Water: Not reported
Surface Water: Not reported
Soil: Suspected
Sediment: Not reported
Air: Not reported
Bedrock: Not reported
Responsible Unit: Southwest

EVERGREEN SPORTSMAN CLUB FORMER (Continued) **S113230273**

INST CONTROL:

Name:	EVERGREEN SPORTSMAN CLUB EAST
Address:	2301 MARVIN RD NE
City,State,Zip:	LACEY, WA 98516
Facility Site ID:	4144
Latitude:	47.065737
Longitude:	-122.768676
Instrument Type:	Environmental Covenant
NFA Date:	Not reported
County Filing # For Individual IC Doc:	4443717
Filing Date Of Individual IC Doc:	05/07/2015
Education Programs:	False
Maintenance Requirements:	False
Restrictive Signage:	False
Soil Restriction:	False
Alternate Site Names:	EVERGREEN SPORTSMAN CLUB FORMER,Wig Properties LLC Nisqually
Surface Water Restriction:	False
Site Status:	Cleanup Started
Swimming Restriction:	False
Tax Parcel Number:	11811120200
Control Active:	True
CS ID:	12083
Region:	Southwest
Responsible Unit:	Southwest
Restrict Shellfish/Finfish Harvesting:	False
Prohibit Removal/Alteration of Buildings:	False
Prohibit New Building Construction:	False
Control Stormwater:	False
Control Vapor/Gas:	False
Restrict Sediment Cap Disturbance:	False
Maintain/Protect Monitoring System:	False
Other:	False
Restrict Land Use:	False
Media Restrictions:	Soil
Restrict All Ground Water Use:	False
Prohibit Domestic Ground Water Well Installation:	False
Prohibit All Soil Disturbance:	True
Access Barrier:	False
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/12083

VCP:

Name:	EVERGREEN SPORTSMAN CLUB EAST
Address:	2301 MARVIN RD NE
City,State,Zip:	LACEY, WA 98516
edr_fstat:	WA
edr_fzip:	98516
edr_fcnty:	THURSTON
edr_zip:	Not reported
Facility ID:	4144
VCP Status:	Cleanup Started
Past VCP:	TRUE
Current VCP:	Not reported
NFA Type:	LACEY, WA 98516
Date NFA:	LACEY, WA 98516
Rank:	LACEY, WA 98516
Cleanup Siteid:	12083

EVERGREEN SPORTSMAN CLUB FORMER (Continued) **S113230273**

Contaminant Name:	Arsenic
Soil:	Remediated-Above
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/12083
Name:	EVERGREEN SPORTSMAN CLUB EAST
Address:	2301 MARVIN RD NE
City,State,Zip:	LACEY, WA 98516
edr_fstat:	WA
edr_fzip:	98516
edr_fcnty:	THURSTON
edr_zip:	Not reported
Facility ID:	4144
VCP Status:	Cleanup Started
Past VCP:	TRUE
Current VCP:	Not reported
NFA Type:	LACEY, WA 98516
Date NFA:	LACEY, WA 98516
Rank:	LACEY, WA 98516
Cleanup Siteid:	12083
Contaminant Name:	Lead
Soil:	Remediated-Above
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/12083
Name:	EVERGREEN SPORTSMAN CLUB EAST
Address:	2301 MARVIN RD NE
City,State,Zip:	LACEY, WA 98516
edr_fstat:	WA
edr_fzip:	98516
edr_fcnty:	THURSTON
edr_zip:	Not reported
Facility ID:	4144
VCP Status:	Cleanup Started
Past VCP:	TRUE
Current VCP:	Not reported
NFA Type:	LACEY, WA 98516
Date NFA:	LACEY, WA 98516
Rank:	LACEY, WA 98516
Cleanup Siteid:	12083
Contaminant Name:	Petroleum-Diesel
Soil:	Remediated-Above
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/12083
Name:	EVERGREEN SPORTSMAN CLUB EAST
Address:	2301 MARVIN RD NE
City,State,Zip:	LACEY, WA 98516
edr_fstat:	WA
edr_fzip:	98516
edr_fcnty:	THURSTON
edr_zip:	Not reported
Facility ID:	4144
VCP Status:	Cleanup Started
Past VCP:	TRUE
Current VCP:	Not reported
NFA Type:	LACEY, WA 98516
Date NFA:	LACEY, WA 98516
Rank:	LACEY, WA 98516
Cleanup Siteid:	12083

EVERGREEN SPORTSMAN CLUB FORMER (Continued) **S113230273**

Contaminant Name: Polycyclic Aromatic Hydrocarbons
Soil: Suspected
URL: https://apps.ecology.wa.gov/cleanupsearch/site/12083

ALLSITES:
Name: EVERGREEN SPORTSMAN CLUB FORMER
Facility Id: 4144

Interaction: 105604
Interaction 1: I
Interaction 2: HWG
Ecology Program: HAZWASTE
Program Data: TURBOWASTE
Facility Alt.: Wig Properties LLC Nisqually
Program ID: WAH000043582
Date Interaction: 2013-06-19 00:00:00
Date Interaction 3: Hazardous Waste Generator
Latitude: 47.065730790400004
Longitude: -122.768667847

Interaction: 114375
Interaction 1: A
Interaction 2: SCS
Ecology Program: TOXICS
Program Data: ISIS
Facility Alt.: EVERGREEN SPORTSMAN CLUB FORMER
Program ID: Not reported
Date Interaction: 2013-03-19 00:00:00
Date Interaction 3: State Cleanup Site
Latitude: 47.065730790400004
Longitude: -122.768667847

Interaction: 104325
Interaction 1: I
Interaction 2: VOLCLNST
Ecology Program: TOXICS
Program Data: ISIS
Facility Alt.: EVERGREEN SPORTSMAN CLUB FORMER
Program ID: SW1284
Date Interaction: 2013-03-19 00:00:00
Date Interaction 3: Voluntary Cleanup Sites
Latitude: 47.065730790400004
Longitude: -122.768667847

Interaction: 108228
Interaction 1: A
Interaction 2: CONSTSWGP
Ecology Program: WATQUAL
Program Data: PARIS
Facility Alt.: Evergreen Sportsman Club Cleanup
Program ID: WAR301818
Date Interaction: 2014-03-21 00:00:00
Date Interaction 3: Construction SW GP
Latitude: 47.065730790400004

EVERGREEN SPORTSMAN CLUB FORMER (Continued) **S113230273**

Longitude: -122.768667847

WA MANIFEST:

Name:	WIG PROPERTIES LLC NISQUALLY
Address:	2301 MARVIN RD NE
City,State,Zip:	LACEY, WA 98516
Facility Address 2:	Not reported
Facility ID:	4144
EPA ID:	WAH000043582
NAICS:	531120
State Waste Code Desc:	Not reported
Federal Waste Code Desc:	D002, D008
Form Comm:	Not reported
Data Year:	2013
Permit by Rule:	False
Mailing Address 2:	Not reported
Treatment by Generator:	False
Mixed Radioactive Waste:	False
Importer of Hazardous Waste:	False
Immediate Recycler:	False
Treatment/Storage/Disposal/Recycling Facility:	False
Generator of Dangerous Fuel Waste:	False
Generator Marketing to Burner:	False
Other Marketers (i.e., blender, distributor, etc.):	False
Utility Boiler Burner:	False
Industry Boiler Burner:	False
Industrial Furnace:	False
Smelter Defferal:	False
Universal Waste:	Not reported
Off-Specification:	Not reported
LN Address 2:	Not reported
Tax Reg #:	603230471
Business Type:	Real Estate Owner
Mail Name:	Wig Properties LLC Nisqually
Mailing Address:	4811 134 PL SE
Mailing City,State,Zip:	Bellevue, WA 98006
Legal Organization Name:	Wig Properties LLC Nisqually
Legal Organization Type:	Private
Legal Contact:	Not reported
Legal Address:	4811 134 PL SE
Legal Address 2:	Not reported
Legal City,State,Zip:	Bellevue, WA 98006
Legal Phone Number:	425-941-8889
Legal Effective Date:	09/26/2012
Land Organization Name:	Wig Properties LLC Nisqually
Land Organization Type:	Private
Land Contact:	Not reported
Land Address:	4811 134 PL SE
Land City,State,Zip:	Bellevue, WA 98006
Land Phone Number:	425-941-8889
Operator Organization Name:	Wig Properties LLC Nisqually
Operator Organization Type:	Private
Operator:	Not reported
Operator Address:	4811 134 PL SE
Operator Address 2:	Not reported
Operator City,State,Zip:	Bellevue, WA 98006

EVERGREEN SPORTSMAN CLUB FORMER (Continued) **S113230273**

Operator Phone Number:	425-941-8889
Operator Effective Date:	09/26/2012
Site Contact:	Leshya Wig
Site Contact Address:	4811 134 PL SE
Contact City,State,Zip:	Bellevue, WA 98006
Site Contact Phone Number:	425-941-8889
Site Contact Email:	leshyawig@wigproperties.com
Gen Status Code:	LQG
Monthly Generation:	False
Batch Generation:	False
One Time Generation:	True
Transport Own Waste:	False
Tranports Other Waste:	False
Recycler Onsite:	False
Transfer Facility:	False
Other Exemption:	Not reported
UW Battery Gen:	False
Used Oil Transporter:	False
Used Oil Transfer Facility:	False
Used Oil Processor:	False
Used Oil Refiner:	False
Used Oil Fuel Marketer Directs Shipments:	False
Used Oil Fuel Marketer Meets Specs:	False
Site Contact Address 2:	Not reported
SIC Code:	Not reported
CRK Number:	Not reported
Active:	Not reported
CAS Number:	Not reported
Chemical Name:	Not reported
EHS:	Not reported
EHS CAS Number:	Not reported
EHS Name:	Not reported

Waste Stream Generated:

Waste Managed Off Site:	Y
State Only Waste Code 1:	WT02
State Only Waste Code 2:	Not reported
Report Managed On Site:	0
KG Managed On Site:	0
Generator Treatment Code:	Not reported
Permit By Rule Code:	Not reported
WCDE Residence Code:	Not reported
WCDH Origin Code:	2
WCDE On Site Code:	Not reported
WCDB Code:	W101
Description:	Process water
CORb Sequence Number:	141864
Sequence Number:	3278399
Mixed Radioactive Flag:	False
Designation Code:	D
Reported Quanity:	165
Quanity Unit:	GAL
Kilograms Quanity:	624.603427
Density Number:	1
Density Quanity:	SPG

Shipments Send:

EVERGREEN SPORTSMAN CLUB FORMER (Continued) **S113230273**

CORB Waste Sequence Number: 141864
Waste Sequence Number: 3278399
Sequence Number: 1733732
Shipment Date: 2013-06-24 00:00:00
Mainfest Document ID: 006548905FLE
Reported Quanity: 165
Unit of Measure: GAL
Kilograms Quanity: 624.603427
Receiving EPAID: COD991300484

Waste Stream Off Site Mgmt:
Waste CORB Sequence Number: 141864
Waste Sequence Number: 3278399
Sequence Number: 814768
Received EPAID: COD991300484
Managed Quanity: 165
Kilogram Quanity: 624.603427
Recycled Percentage: 0
Waste Management System Code: H132

Waste Stream Comments:
CORB Waste Sequence Number: 141864
Comments: Waste water from pilot lead shot recovery test on site.
Waste Sequence Number: 3278399
Sequence Number: 1

Waste Stream EPA Code:
CORB Waste Sequence Number: 141864
Waste Sequence Number: 3278399
Sequence Number: 7287788
WCDA Code: D002

Waste Sequence Number: 3278399
Sequence Number: 7287787
WCDA Code: D008

Waste Stream Source Code:
CORB Waste Sequence Number: 141864
Waste Sequence Number: 3278399
Sequence Number: 1
WCDD Code: G39

---

7 **BRITTON PARKWAY FILL PERMIT** **ALLSITES** **S111769572**
NNE **2535 MARVIN RD NE** **N/A**
1/4-1/2 **LACEY, WA 98506**
0.343 mi.
1810 ft.

Relative: Higher
Actual: 233 ft.

ALLSITES:
Name: BRITTON PARKWAY FILL PERMIT
Facility Id: 13690

Interaction: 101260
Interaction 1: A
Interaction 2: CONSTSWGP

BRITTON PARKWAY FILL PERMIT (Continued) **S111769572**

Ecology Program:	WATQUAL
Program Data:	PARIS
Facility Alt.:	Britton Parkway Fill Permit
Program ID:	WAR125732
Date Interaction:	2012-03-06 00:00:00
Date Interaction 3:	Construction SW GP
Latitude:	47.070159487399998
Longitude:	-122.775277858

---

8 **WALMART SUPERCENTER 3531** **RCRA-SQG** **1007265235**
SSE **1401 GALAXY DR NE** **ALLSITES** **WAH000019315**
1/4-1/2 **LACEY, WA 98503** **SPILLS**
0.364 mi. **MANIFEST**
1920 ft.

Relative:
Higher

Actual:
228 ft.

RCRA Listings:

Date Form Received by Agency:		20220221
Handler Name:	WALMART SUPERCENTER 3531	
Handler Address:		1401 GALAXY DR NE
Handler City,State,Zip:		LACEY, WA 98503
EPA ID:		WAH000019315
Contact Name:		CASSIE CLARK
Contact Address:		PO BOX 8041
Contact City,State,Zip:		BENTONVILLE, AR 72712-8041
Contact Telephone:		479-360-0632
Contact Fax:		Not reported
Contact Email:		CASSIE.CLARK@WALMART.COM
Contact Title:		SENIOR MANAGER
EPA Region:		10
Land Type:		Private
Federal Waste Generator Description:		Small Quantity Generator
Non-Notifier:		Not reported
Biennial Report Cycle:		Not reported
Accessibility:		Not reported
Active Site Indicator:		Handler Activities
State District Owner:		WA
State District:		SWRO
Mailing Address:		PO BOX 8041
Mailing City,State,Zip:		BENTONVILLE, AR 72712-8041
Owner Name:	WALMART INC	
Owner Type:		Private
Operator Name:	WALMART INC.	
Operator Type:		Private
Short-Term Generator Activity:		No
Importer Activity:		No
Mixed Waste Generator:		No
Transporter Activity:		No
Transfer Facility Activity:		No
Recycler Activity with Storage:		No
Small Quantity On-Site Burner Exemption:		No
Smelting Melting and Refining Furnace Exemption:		No
Underground Injection Control:		No
Off-Site Waste Receipt:		No
Universal Waste Indicator:		No
Universal Waste Destination Facility:		No
Federal Universal Waste:		No
Active Site Fed-Reg Treatment Storage and Disposal Facility:		Not reported

WALMART SUPERCENTER 3531 (Continued) **1007265235**

Active Site Converter Treatment storage and Disposal Facility:	Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
Commercial TSD Indicator:	No
Treatment Storage and Disposal Type:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
Permit Renewals Workload Universe:	Not reported
Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20220304
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	H

Biennial: List of Years
Year: 2011

Click Here for Biennial Reporting System Data:
Year: 2009

Click Here for Biennial Reporting System Data:
Year: 2007

Click Here for Biennial Reporting System Data:
Year: 2005

Click Here for Biennial Reporting System Data:
Year: 2003

Pages 26-147 concern various activities at the Walmart Supercenter involving the presence and handling of small quantities of hazardous materials. These pages can be viewed in the full EDR report delivered separately in electronic form.

WALMART SUPERCENTER 3531 (Continued) **1007265235**

Waste Sequence Number:	2018845
Sequence Number:	1
WCDD Code:	G32
Waste Sequence Number:	2018852
Sequence Number:	1
WCDD Code:	G19
Waste Sequence Number:	2018842
Sequence Number:	1
WCDD Code:	G32
Waste Sequence Number:	2018847
Sequence Number:	1
WCDD Code:	G19
Waste Sequence Number:	2018848
Sequence Number:	1
WCDD Code:	G19
Waste Sequence Number:	2018846
Sequence Number:	1
WCDD Code:	G19
Waste Sequence Number:	2018851
Sequence Number:	1
WCDD Code:	G19
Waste Sequence Number:	2018849
Sequence Number:	1
WCDD Code:	G19

Click this hyperlink while viewing on your computer to access
1 additional WA MANIFEST: record(s) in the EDR Site Report.

B9 **PACIFIC PRIDE MARVIN RD** **HSL** **S110036601**
East **2135 MARVIN RD NE** **CSCSL** **N/A**
1/4-1/2 **OLYMPIA, WA 98516** **ALLSITES**
0.426 mi. **ASBESTOS**
2248 ft. **Site 1 of 3 in cluster B** **PTAP**

Relative: **Lower**
Actual: **218 ft.**

HSL:

Name:	PACIFIC PRIDE MARVIN RD
Address:	Not reported
City,State,Zip:	OLYMPIA, WA
edr_fstat:	WA
edr_fzip:	Not reported
edr_fcnty:	THURSTON
edr_zip:	Not reported
Facility Type:	**Hazardous Sites List**
Facility Status:	Cleanup Started
FSID Number:	11334
Rank:	2
Region:	PLIA
EDR Link ID:	11334
Region Decode:	Not reported

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

CSCSL:

Name:	PACIFIC PRIDE MARVIN RD
Address:	2135 MARVIN RD NE
City,State,Zip:	OLYMPIA, WA 98516
Facility ID:	11334
Region:	Southwest
Lat/Long:	47.06528 / -122.766729
Clean Up Siteid:	1284
Site Status:	Cleanup Started
Contaminant Name:	Benzene
Alternate Site Names:	MARVIN RD CDLK
Site Rank:	2 - Moderate-High Risk
Has Institutional Control:	Not reported
Past VCP:	Not reported
Current VCP:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/1284
Ground Water:	Confirmed Above Cleanup Levels
Surface Water:	Not reported
Soil:	Confirmed Above Cleanup Levels
Sediment:	Not reported
Air:	Confirmed Above Cleanup Levels
Bedrock:	Not reported
Responsible Unit:	Pollution Liability Ins Agcy

Name:	PACIFIC PRIDE MARVIN RD
Address:	2135 MARVIN RD NE
City,State,Zip:	OLYMPIA, WA 98516
Facility ID:	11334
Region:	Southwest
Lat/Long:	47.06528 / -122.766729
Clean Up Siteid:	1284
Site Status:	Cleanup Started
Contaminant Name:	Lead
Alternate Site Names:	MARVIN RD CDLK
Site Rank:	2 - Moderate-High Risk
Has Institutional Control:	Not reported
Past VCP:	Not reported
Current VCP:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/1284
Ground Water:	Confirmed Above Cleanup Levels
Surface Water:	Not reported
Soil:	Confirmed Above Cleanup Levels
Sediment:	Not reported
Air:	Not reported
Bedrock:	Not reported
Responsible Unit:	Pollution Liability Ins Agcy

Name:	PACIFIC PRIDE MARVIN RD
Address:	2135 MARVIN RD NE
City,State,Zip:	OLYMPIA, WA 98516
Facility ID:	11334
Region:	Southwest
Lat/Long:	47.06528 / -122.766729
Clean Up Siteid:	1284
Site Status:	Cleanup Started
Contaminant Name:	Petroleum Products-Unspecified
Alternate Site Names:	MARVIN RD CDLK

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

Site Rank: 2 - Moderate-High Risk
Has Institutional Control: Not reported
Past VCP: Not reported
Current VCP: Not reported
URL: https://apps.ecology.wa.gov/cleanupsearch/site/1284
Ground Water: Confirmed Above Cleanup Levels
Surface Water: Not reported
Soil: Not reported
Sediment: Not reported
Air: Not reported
Bedrock: Not reported
Responsible Unit: Pollution Liability Ins Agcy

Name: PACIFIC PRIDE MARVIN RD
Address: 2135 MARVIN RD NE
City,State,Zip: OLYMPIA, WA 98516
Facility ID: 11334
Region: Southwest
Lat/Long: 47.06528 / -122.766729
Clean Up Siteid: 1284
Site Status: Cleanup Started
Contaminant Name: Petroleum-Diesel
Alternate Site Names: MARVIN RD CDLK
Site Rank: 2 - Moderate-High Risk
Has Institutional Control: Not reported
Past VCP: Not reported
Current VCP: Not reported
URL: https://apps.ecology.wa.gov/cleanupsearch/site/1284
Ground Water: Confirmed Above Cleanup Levels
Surface Water: Not reported
Soil: Confirmed Above Cleanup Levels
Sediment: Not reported
Air: Not reported
Bedrock: Not reported
Responsible Unit: Pollution Liability Ins Agcy

Name: PACIFIC PRIDE MARVIN RD
Address: 2135 MARVIN RD NE
City,State,Zip: OLYMPIA, WA 98516
Facility ID: 11334
Region: Southwest
Lat/Long: 47.06528 / -122.766729
Clean Up Siteid: 1284
Site Status: Cleanup Started
Contaminant Name: Petroleum-Gasoline
Alternate Site Names: MARVIN RD CDLK
Site Rank: 2 - Moderate-High Risk
Has Institutional Control: Not reported
Past VCP: Not reported
Current VCP: Not reported
URL: https://apps.ecology.wa.gov/cleanupsearch/site/1284
Ground Water: Confirmed Above Cleanup Levels
Surface Water: Not reported
Soil: Confirmed Above Cleanup Levels
Sediment: Not reported
Air: Not reported
Bedrock: Not reported

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

Responsible Unit: Pollution Liability Ins Agcy

Name: PACIFIC PRIDE MARVIN RD
Address: 2135 MARVIN RD NE
City,State,Zip: OLYMPIA, WA 98516
Facility ID: 11334
Region: Southwest
Lat/Long: 47.06528 / -122.766729
Clean Up Siteid: 1284
Site Status: Cleanup Started
Contaminant Name: Petroleum-Other
Alternate Site Names: MARVIN RD CDLK
Site Rank: 2 - Moderate-High Risk
Has Institutional Control: Not reported
Past VCP: Not reported
Current VCP: Not reported
URL: https://apps.ecology.wa.gov/cleanupsearch/site/1284
Ground Water: Not reported
Surface Water: Not reported
Soil: Confirmed Above Cleanup Levels
Sediment: Not reported
Air: Not reported
Bedrock: Not reported
Responsible Unit: Pollution Liability Ins Agcy

Name: PACIFIC PRIDE MARVIN RD
Address: 2135 MARVIN RD NE
City,State,Zip: OLYMPIA, WA 98516
Facility ID: 11334
Region: Southwest
Lat/Long: 47.06528 / -122.766729
Clean Up Siteid: 1284
Site Status: Cleanup Started
Contaminant Name: Polycyclic Aromatic Hydrocarbons
Alternate Site Names: MARVIN RD CDLK
Site Rank: 2 - Moderate-High Risk
Has Institutional Control: Not reported
Past VCP: Not reported
Current VCP: Not reported
URL: https://apps.ecology.wa.gov/cleanupsearch/site/1284
Ground Water: Not reported
Surface Water: Not reported
Soil: Not reported
Sediment: Not reported
Air: Confirmed Above Cleanup Levels
Bedrock: Not reported
Responsible Unit: Pollution Liability Ins Agcy

ALLSITES:
Name: PACIFIC PRIDE MARVIN RD
Facility Id: 11334

Interaction: 86852
Interaction 1: A
Interaction 2: SCS
Ecology Program: TOXICS
Program Data: ISIS

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

Facility Alt.:	PACIFIC PRIDE MARVIN RD
Program ID:	Not reported
Date Interaction:	2009-05-12 00:00:00
Date Interaction 3:	State Cleanup Site
Latitude:	47.065274458200001
Longitude:	-122.76671416400001

Interaction:	109167
Interaction 1:	A
Interaction 2:	UST
Ecology Program:	TOXICS
Program Data:	UST
Facility Alt.:	Not reported
Program ID:	3956
Date Interaction:	1972-03-03 00:00:00
Date Interaction 3:	Underground Storage Tank
Latitude:	47.065274458200001
Longitude:	-122.76671416400001

ASBESTOS:

Name:	Not reported
Address:	2135 MARVIN RD NE
City,State,Zip:	OLYMPIA, WA 98513
Facility Type:	Fuel Station
Parent ID:	105425
Form ID:	105729##1511Rhine386784
Notice Date:	09/11/2015
Start Date:	09/14/2015
Completion Date:	10/31/2015
Initial:	Not reported
Amended:	1
On Hold:	1
Off Hold:	Not reported
Emergency:	Not reported
Site Hours Start:	7:00am
Site Hours End:	3:30pm
Sunday:	Not reported
Monday:	1
Tuesday:	1
Wednesday:	1
Thursday:	1
Friday:	1
Saturday:	Not reported
Contractor ID:	Not reported
Phone:	253-537-5852
Job Site CAS:	David Schultz
Project Form Email:	wendyd@rhinedemolition.com
Property Owner Name:	Not reported
Property Owner Agent:	Not reported
Property Owner Company:	Rhine Demolition LLC (ABCN00001511)
Property Owner Address:	4820 She Nah Num Dr SE
Property Owner City:	Olympia
Property Owner State:	WA
Property Owner Zip4:	98513
Property Owner Phone:	360-456-5221

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

Job Site Room:	Not reported
Facility Age:	Not reported
Facility Size:	Not reported
Facility Remodel:	Not reported
Facility Demo:	1
Facility Repair:	Not reported
Facility Maint:	Not reported
Removed:	1
Encapsulated:	Not reported
Quantity Sq Ft:	76
Fireproofing:	Not reported
Popcorn Ceiling:	Not reported
CAB:	Not reported
Sheet Vinyl:	Not reported
Asbestos Paper:	Not reported
Boiler Insulation:	Not reported
Duct Paper:	Not reported
VAT:	1
Roofing:	Not reported
Sq Ft Other:	1
Sq Ft Other Text:	roof sealant
Quantity Lin Ft:	30
Mag Pipe Insulation:	Not reported
Air Cell Pipe Insulation:	Not reported
Ducting Insulation:	Not reported
Cement Asbestos Pipe:	Not reported
Mudded Pipe Insulation:	Not reported
Duct Tape:	Not reported
Lin Ft Other1:	1
Lin Ft Other1 Text:	cove base
Lin Ft Other2:	1
Lin Ft Other2 Text:	window putty
Indoors:	1
Outdoors:	1
Neg Pres Enclosure:	Not reported
Glove Bag:	Not reported
Mini Enclosure:	Not reported
Critical Barriers:	Not reported
Wrap And Cut:	Not reported
Wet Methods:	1
HEPA Vacuum:	1
MANUALMETHODS :	1
Other CM1:	Not reported
Other CM1 Text:	Not reported
Other CM2:	1
Other CM2 Text:	regulated area
Half Mask APR:	1
Full Face APR:	Not reported
PAPR:	Not reported
Type C Continuous:	Not reported
Type C Pressure:	Not reported
Other Resp Pro:	Not reported
Other Resp Pro Text:	Not reported
Comments:	Not reported
Date Time Submitted:	2015-09-11 16:55:24
Submitter IP Address:	23.25.140.105
Region:	4

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

UBI:	603071050
Notice type:	Initial
Project Type:	Other linear footage, Other Square Footage, Vinyl Asbestos Tile
Supervisor:	David Schultz ()
Supervisor Phone:	Not reported
Certificate Status:	ACTIVE
Name:	Not reported
Address:	2135 MARVIN RD NE
City,State,Zip:	OLYMPIA, WA 98513
Facility Type:	Fuel Station
Parent ID:	105425
Form ID:	107120##1511Rhine931512
Notice Date:	10/15/2015
Start Date:	09/14/2015
Completion Date:	10/31/2015
Initial:	Not reported
Amended:	1
On Hold:	Not reported
Off Hold:	1
Emergency:	Not reported
Site Hours Start:	7:00am
Site Hours End:	3:30pm
Sunday:	Not reported
Monday:	1
Tuesday:	1
Wednesday:	1
Thursday:	1
Friday:	1
Saturday:	Not reported
Contractor ID:	Not reported
Phone:	253-537-5852
Job Site CAS:	Chris Drea
Project Form Email:	wendyd@rhinedemolition.com
Property Owner Name:	Not reported
Property Owner Agent:	Not reported
Property Owner Company:	Rhine Demolition LLC (ABCN00001511)
Property Owner Address:	4820 She Nah Num Dr SE
Property Owner City:	Olympia
Property Owner State:	WA
Property Owner Zip4:	98513
Property Owner Phone:	360-456-5221
Job Site Room:	Not reported
Facility Age:	Not reported
Facility Size:	Not reported
Facility Remodel:	Not reported
Facility Demo:	1
Facility Repair:	Not reported
Facility Maint:	Not reported
Removed:	1
Encapsulated:	Not reported
Quantity Sq Ft:	76
Fireproofing:	Not reported
Popcorn Ceiling:	Not reported
CAB:	Not reported
Sheet Vinyl:	Not reported
Asbestos Paper:	Not reported

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

Boiler Insulation:	Not reported
Duct Paper:	Not reported
VAT:	1
Roofing:	Not reported
Sq Ft Other:	1
Sq Ft Other Text:	roof sealant
Quantity Lin Ft:	30
Mag Pipe Insulation:	Not reported
Air Cell Pipe Insulation:	Not reported
Ducting Insulation:	Not reported
Cement Asbestos Pipe:	Not reported
Mudded Pipe Insulation:	Not reported
Duct Tape:	Not reported
Lin Ft Other1:	1
Lin Ft Other1 Text:	cove base
Lin Ft Other2:	1
Lin Ft Other2 Text:	window putty
Indoors:	1
Outdoors:	1
Neg Pres Enclosure:	Not reported
Glove Bag:	Not reported
Mini Enclosure:	Not reported
Critical Barriers:	Not reported
Wrap And Cut:	Not reported
Wet Methods:	1
HEPA Vacuum:	1
MANUALMETHODS :	1
Other CM1:	Not reported
Other CM1 Text:	Not reported
Other CM2:	1
Other CM2 Text:	regulated area
Half Mask APR:	1
Full Face APR:	Not reported
PAPR:	Not reported
Type C Continuous:	Not reported
Type C Pressure:	Not reported
Other Resp Pro:	Not reported
Other Resp Pro Text:	Not reported
Comments:	Not reported
Date Time Submitted:	2015-10-15 15:25:45
Submitter IP Address:	23.25.140.105
Region:	4
UBI:	603071050
Notice type:	Initial
Project Type:	Other linear footage, Other Square Footage, Vinyl Asbestos Tile
Supervisor:	Chris Drea ()
Supervisor Phone:	Not reported
Certificate Status:	ACTIVE
Name:	Not reported
Address:	2135 MARVIN RD NE
City,State,Zip:	OLYMPIA, WA 98513
Facility Type:	Fuel Station
Parent ID:	105425
Form ID:	107163##1511Rhine075723
Notice Date:	10/16/2015
Start Date:	09/14/2015

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

Completion Date:	10/31/2015
Initial:	Not reported
Amended:	1
On Hold:	1
Off Hold:	Not reported
Emergency:	Not reported
Site Hours Start:	7:00am
Site Hours End:	3:30pm
Sunday:	Not reported
Monday:	Not reported
Tuesday:	Not reported
Wednesday:	Not reported
Thursday:	Not reported
Friday:	1
Saturday:	Not reported
Contractor ID:	Not reported
Phone:	253-537-5852
Job Site CAS:	Chris Drea
Project Form Email:	wendyd@rhinedemolition.com
Property Owner Name:	Not reported
Property Owner Agent:	Not reported
Property Owner Company:	Rhine Demolition LLC (ABCN00001511)
Property Owner Address:	4820 She Nah Num Dr SE
Property Owner City:	Olympia
Property Owner State:	WA
Property Owner Zip4:	98513
Property Owner Phone:	360-456-5221
Job Site Room:	Not reported
Facility Age:	Not reported
Facility Size:	Not reported
Facility Remodel:	Not reported
Facility Demo:	1
Facility Repair:	Not reported
Facility Maint:	Not reported
Removed:	1
Encapsulated:	Not reported
Quantity Sq Ft:	76
Fireproofing:	Not reported
Popcorn Ceiling:	Not reported
CAB:	Not reported
Sheet Vinyl:	Not reported
Asbestos Paper:	Not reported
Boiler Insulation:	Not reported
Duct Paper:	Not reported
VAT:	1
Roofing:	Not reported
Sq Ft Other:	1
Sq Ft Other Text:	roof sealant
Quantity Lin Ft:	30
Mag Pipe Insulation:	Not reported
Air Cell Pipe Insulation:	Not reported
Ducting Insulation:	Not reported
Cement Asbestos Pipe:	Not reported
Mudded Pipe Insulation:	Not reported
Duct Tape:	Not reported
Lin Ft Other1:	1
Lin Ft Other1 Text:	cove base

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

Lin Ft Other2:	1
Lin Ft Other2 Text:	window putty
Indoors:	1
Outdoors:	1
Neg Pres Enclosure:	Not reported
Glove Bag:	Not reported
Mini Enclosure:	Not reported
Critical Barriers:	Not reported
Wrap And Cut:	Not reported
Wet Methods:	1
HEPA Vacuum:	1
MANUALMETHODS :	1
Other CM1:	Not reported
Other CM1 Text:	Not reported
Other CM2:	1
Other CM2 Text:	regulated area
Half Mask APR:	1
Full Face APR:	Not reported
PAPR:	Not reported
Type C Continuous:	Not reported
Type C Pressure:	Not reported
Other Resp Pro:	Not reported
Other Resp Pro Text:	Not reported
Comments:	Not reported
Date Time Submitted:	2015-10-16 13:38:28
Submitter IP Address:	23.25.140.105
Region:	4
UBI:	603071050
Notice type:	Initial
Project Type:	Other linear footage, Other Square Footage, Vinyl Asbestos Tile
Supervisor:	Chris Drea ()
Supervisor Phone:	Not reported
Certificate Status:	ACTIVE
Name:	Not reported
Address:	2135 MARVIN RD NE
City,State,Zip:	OLYMPIA, WA 98513
Facility Type:	Fuel Station
Parent ID:	0
Form ID:	105425##1511Rhine585869
Notice Date:	09/03/2015
Start Date:	09/14/2015
Completion Date:	10/31/2015
Initial:	1
Amended:	Not reported
On Hold:	Not reported
Off Hold:	Not reported
Emergency:	Not reported
Site Hours Start:	7:00am
Site Hours End:	3:30pm
Sunday:	Not reported
Monday:	1
Tuesday:	1
Wednesday:	1
Thursday:	1
Friday:	1
Saturday:	Not reported

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

Contractor ID:	Not reported
Phone:	253-537-5852
Job Site CAS:	David Schultz
Project Form Email:	wendyd@rhinedemolition.com
Property Owner Name:	Not reported
Property Owner Agent:	Not reported
Property Owner Company:	Rhine Demolition LLC (ABCN00001511)
Property Owner Address:	4820 She Nah Num Dr SE
Property Owner City:	Olympia
Property Owner State:	WA
Property Owner Zip4:	98513
Property Owner Phone:	360-456-5221
Job Site Room:	Not reported
Facility Age:	Not reported
Facility Size:	Not reported
Facility Remodel:	Not reported
Facility Demo:	1
Facility Repair:	Not reported
Facility Maint:	Not reported
Removed:	1
Encapsulated:	Not reported
Quantity Sq Ft:	76
Fireproofing:	Not reported
Popcorn Ceiling:	Not reported
CAB:	Not reported
Sheet Vinyl:	Not reported
Asbestos Paper:	Not reported
Boiler Insulation:	Not reported
Duct Paper:	Not reported
VAT:	1
Roofing:	Not reported
Sq Ft Other:	1
Sq Ft Other Text:	roof sealant
Quantity Lin Ft:	30
Mag Pipe Insulation:	Not reported
Air Cell Pipe Insulation:	Not reported
Ducting Insulation:	Not reported
Cement Asbestos Pipe:	Not reported
Mudded Pipe Insulation:	Not reported
Duct Tape:	Not reported
Lin Ft Other1:	1
Lin Ft Other1 Text:	cove base
Lin Ft Other2:	1
Lin Ft Other2 Text:	window putty
Indoors:	1
Outdoors:	1
Neg Pres Enclosure:	Not reported
Glove Bag:	Not reported
Mini Enclosure:	Not reported
Critical Barriers:	Not reported
Wrap And Cut:	Not reported
Wet Methods:	1
HEPA Vacuum:	1
MANUALMETHODS :	1
Other CM1:	Not reported
Other CM1 Text:	Not reported
Other CM2:	1

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

Other CM2 Text:	regulated area
Half Mask APR:	1
Full Face APR:	Not reported
PAPR:	Not reported
Type C Continuous:	Not reported
Type C Pressure:	Not reported
Other Resp Pro:	Not reported
Other Resp Pro Text:	Not reported
Comments:	Not reported
Date Time Submitted:	2015-09-03 16:07:02
Submitter IP Address:	23.25.140.105
Region:	4
UBI:	603071050
Notice type:	Initial
Project Type:	Other linear footage, Other Square Footage, Vinyl Asbestos Tile
Supervisor:	David Schultz ()
Supervisor Phone:	Not reported
Certificate Status:	ACTIVE
Name:	Not reported
Address:	2135 MARVIN RD NE
City,State,Zip:	OLYMPIA, WA 98513
Facility Type:	Fuel Station
Parent ID:	105425
Form ID:	107408##1511Rhine973625
Notice Date:	10/23/2015
Start Date:	09/14/2015
Completion Date:	10/16/2015
Initial:	Not reported
Amended:	1
On Hold:	1
Off Hold:	Not reported
Emergency:	Not reported
Site Hours Start:	7:00am
Site Hours End:	3:30pm
Sunday:	Not reported
Monday:	Not reported
Tuesday:	Not reported
Wednesday:	Not reported
Thursday:	Not reported
Friday:	1
Saturday:	Not reported
Contractor ID:	Not reported
Phone:	253-537-5852
Job Site CAS:	Chris Drea
Project Form Email:	wendyd@rhinedemolition.com
Property Owner Name:	Not reported
Property Owner Agent:	Not reported
Property Owner Company:	Rhine Demolition LLC (ABCN00001511)
Property Owner Address:	4820 She Nah Num Dr SE
Property Owner City:	Olympia
Property Owner State:	WA
Property Owner Zip4:	98513
Property Owner Phone:	360-456-5221
Job Site Room:	Not reported
Facility Age:	Not reported
Facility Size:	Not reported

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

Facility Remodel:	Not reported
Facility Demo:	1
Facility Repair:	Not reported
Facility Maint:	Not reported
Removed:	1
Encapsulated:	Not reported
Quantity Sq Ft:	76
Fireproofing:	Not reported
Popcorn Ceiling:	Not reported
CAB:	Not reported
Sheet Vinyl:	Not reported
Asbestos Paper:	Not reported
Boiler Insulation:	Not reported
Duct Paper:	Not reported
VAT:	1
Roofing:	Not reported
Sq Ft Other:	1
Sq Ft Other Text:	roof sealant
Quantity Lin Ft:	30
Mag Pipe Insulation:	Not reported
Air Cell Pipe Insulation:	Not reported
Ducting Insulation:	Not reported
Cement Asbestos Pipe:	Not reported
Mudded Pipe Insulation:	Not reported
Duct Tape:	Not reported
Lin Ft Other1:	1
Lin Ft Other1 Text:	cove base
Lin Ft Other2:	1
Lin Ft Other2 Text:	window putty
Indoors:	1
Outdoors:	1
Neg Pres Enclosure:	Not reported
Glove Bag:	Not reported
Mini Enclosure:	Not reported
Critical Barriers:	Not reported
Wrap And Cut:	Not reported
Wet Methods:	1
HEPA Vacuum:	1
MANUALMETHODS :	1
Other CM1:	Not reported
Other CM1 Text:	Not reported
Other CM2:	1
Other CM2 Text:	regulated area
Half Mask APR:	1
Full Face APR:	Not reported
PAPR:	Not reported
Type C Continuous:	Not reported
Type C Pressure:	Not reported
Other Resp Pro:	Not reported
Other Resp Pro Text:	Not reported
Comments:	Not reported
Date Time Submitted:	2015-10-23 08:28:22
Submitter IP Address:	23.25.140.105
Region:	4
UBI:	603071050
Notice type:	Initial
Project Type:	Other linear footage, Other Square Footage, Vinyl Asbestos Tile

PACIFIC PRIDE MARVIN RD (Continued) **S110036601**

Supervisor: Chris Drea ()
Supervisor Phone: Not reported
Certificate Status: ACTIVE

PTAP:
Name: PACIFIC PRIDE MARVIN RD
Address: 2135 MARVIN RD NE
City,State,Zip: OLYMPIA, WA 98516
Site ID: PSW018
FSID Number: 11334
Entry Date: 04/10/2018
Status: In Progress

B10 **HAZO DRUM SITE** **ALLSITES** **1001226284**
East **2420 A HOGUMBAY RD** **RCRA NonGen / NLR** **WAH000002485**
1/4-1/2 **OLYMPIA, WA 98506**
0.431 mi.
2277 ft. **Site 2 of 3 in cluster B**

Relative:
Lower

Actual:
218 ft.

ALLSITES:
Name: HAZO DRUM SITE
Facility Id: 25352164

Interaction: 34403
Interaction 1: I
Interaction 2: HWG
Ecology Program: HAZWASTE
Program Data: TURBOWASTE
Facility Alt.: Not reported
Program ID: WAH000002485
Date Interaction: 1997-08-14 00:00:00
Date Interaction 3: Hazardous Waste Generator
Latitude: 47.065229893100003
Longitude: -122.766614417

RCRA Listings:
Date Form Received by Agency: 19980211
Handler Name: HAZO DRUM SITE
Handler Address: 2420 A HOGUMBAY RD
Handler City,State,Zip: OLYMPIA, WA 98506
EPA ID: WAH000002485
Contact Name: BRETT MANNING
Contact Address: PO BOX 47775
Contact City,State,Zip: OLYMPIA, WA 98504
Contact Telephone: 360-407-6376
Contact Fax: Not reported
Contact Email: Not reported
Contact Title: Not reported
EPA Region: 10
Land Type: Other
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported
Active Site Indicator: Not reported
State District Owner: WA

HAZO DRUM SITE (Continued) **1001226284**

State District:		SWRO
Mailing Address:		PO BOX 47555
Mailing City,State,Zip:		OLYMPIA, WA 98504
Owner Name:	WA ECY	
Owner Type:		Private
Operator Name:	MANNING, BRETT	
Operator Type:		Private
Short-Term Generator Activity:		No
Importer Activity:		No
Mixed Waste Generator:		No
Transporter Activity:		No
Transfer Facility Activity:		No
Recycler Activity with Storage:		No
Small Quantity On-Site Burner Exemption:		No
Smelting Melting and Refining Furnace Exemption:		No
Underground Injection Control:		No
Off-Site Waste Receipt:		No
Universal Waste Indicator:		No
Universal Waste Destination Facility:		No
Federal Universal Waste:		No
Active Site Fed-Reg Treatment Storage and Disposal Facility:		Not reported
Active Site Converter Treatment storage and Disposal Facility:		Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:		Not reported
Active Site State-Reg Handler:		---
Federal Facility Indicator:		Not reported
Hazardous Secondary Material Indicator:		NN
Sub-Part K Indicator:		Not reported
Commercial TSD Indicator:		No
Treatment Storage and Disposal Type:		Not reported
2018 GPRA Permit Baseline:		Not on the Baseline
2018 GPRA Renewals Baseline:		Not on the Baseline
Permit Renewals Workload Universe:		Not reported
Permit Workload Universe:		Not reported
Permit Progress Universe:		Not reported
Post-Closure Workload Universe:		Not reported
Closure Workload Universe:		Not reported
202 GPRA Corrective Action Baseline:		No
Corrective Action Workload Universe:		No
Subject to Corrective Action Universe:		No
Non-TSDFs Where RCRA CA has Been Imposed Universe:		No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:		No
TSDFs Only Subject to CA under Discretionary Auth Universe:		No
Corrective Action Priority Ranking:		No NCAPS ranking
Environmental Control Indicator:		No
Institutional Control Indicator:		No
Human Exposure Controls Indicator:		N/A
Groundwater Controls Indicator:		N/A
Operating TSDF Universe:		Not reported
Full Enforcement Universe:		Not reported
Significant Non-Complier Universe:		No
Unaddressed Significant Non-Complier Universe:		No
Addressed Significant Non-Complier Universe:		No
Significant Non-Complier With a Compliance Schedule Universe:		No
Financial Assurance Required:		Not reported
Handler Date of Last Change:		20180510
Recognized Trader-Importer:		No
Recognized Trader-Exporter:		No

HAZO DRUM SITE (Continued) **1001226284**

Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Hazardous Waste Summary:

Waste Code:	F001
Waste Description:	THE FOLLOWING SPENT HALOGENATED SOLVENTS USED IN DEGREASING: TETRACHLOROETHYLENE, TRICHLORETHYLENE, METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, CARBON TETRACHLORIDE AND CHLORINATED FLUOROCARBONS; ALL SPENT SOLVENT MIXTURES/BLENDS USED IN DEGREASING CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F002, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Waste Code:	F002
Waste Description:	THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2, TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name:	WA ECY
Legal Status:	Private
Date Became Current:	19970814
Date Ended Current:	Not reported
Owner/Operator Address:	PO BOX 47555
Owner/Operator City,State,Zip:	OLYMPIA, WA 98504
Owner/Operator Telephone:	000-000-0000
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Owner
Owner/Operator Name:	THURSTON CNTY HOUSHOLD HAZ WASTE FACILIT
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	2420 A HOGUM BAY RD
Owner/Operator City,State,Zip:	LACEY, WA 98506
Owner/Operator Telephone:	000-000-0000
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name:	WA ECY

HAZO DRUM SITE (Continued) **1001226284**

Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 47555
Owner/Operator City,State,Zip: OLYMPIA, WA 98504
Owner/Operator Telephone: 000-000-0000
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: THURSTON CNTY HOUSHOLD HAZ WASTE FACILIT
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 2420 A HOGUM BAY RD
Owner/Operator City,State,Zip: LACEY, WA 98506
Owner/Operator Telephone: 000-000-0000
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: THURSTON CNTY HOUSHOLD HAZ WASTE FACILIT
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 2420 A HOGUM BAY RD
Owner/Operator City,State,Zip: LACEY, WA 98506
Owner/Operator Telephone: 000-000-0000
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Operator
Owner/Operator Name: MANNING, BRETT
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 47775
Owner/Operator City,State,Zip: OLYMPIA, WA 98504
Owner/Operator Telephone: 360-407-6376
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Operator
Owner/Operator Name: MANNING, BRETT
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 47775
Owner/Operator City,State,Zip: OLYMPIA, WA 98504
Owner/Operator Telephone: 360-407-6376
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

HAZO DRUM SITE (Continued) **1001226284**

Owner/Operator Indicator: Owner
Owner/Operator Name: WA ECY
Legal Status: Private
Date Became Current: 19970814
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 47555
Owner/Operator City,State,Zip: OLYMPIA, WA 98504
Owner/Operator Telephone: 000-000-0000
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Operator
Owner/Operator Name: MANNING, BRETT
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 47775
Owner/Operator City,State,Zip: OLYMPIA, WA 98504
Owner/Operator Telephone: 360-407-6376
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: THURSTON CNTY HOUSHOLD HAZ WASTE FACILIT
Legal Status: Private
Date Became Current: 19980511
Date Ended Current: Not reported
Owner/Operator Address: 2420 A HOGUM BAY RD
Owner/Operator City,State,Zip: LACEY, WA 98506
Owner/Operator Telephone: 000-000-0000
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: THURSTON CNTY H T
Legal Status: Private
Date Became Current: 19980511
Date Ended Current: Not reported
Owner/Operator Address: 2420 A HOGUM BAY RD
Owner/Operator City,State,Zip: LACEY, WA 98506
Owner/Operator Telephone: 000-000-0000
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Operator
Owner/Operator Name: BRETT M
Legal Status: Private
Date Became Current: 19970814
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 47775
Owner/Operator City,State,Zip: OLYMPIA, WA 98504-7555
Owner/Operator Telephone: 360-407-6376
Owner/Operator Telephone Ext: Not reported

HAZO DRUM SITE (Continued) **1001226284**

Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: WA ECY
Legal Status: Private
Date Became Current: 19970814
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 47555
Owner/Operator City,State,Zip: OLYMPIA, WA 98504
Owner/Operator Telephone: 000-000-0000
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: THURSTON CNTY HOUSHOLD HAZ WASTE FACILIT
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 2420 A HOGUM BAY RD
Owner/Operator City,State,Zip: LACEY, WA 98506
Owner/Operator Telephone: 000-000-0000
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Operator
Owner/Operator Name: MANNING, BRETT
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 47775
Owner/Operator City,State,Zip: OLYMPIA, WA 98504
Owner/Operator Telephone: 360-407-6376
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: THURSTON CNTY HOUSHOLD HAZ WASTE FACILIT
Legal Status: Private
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 2420 A HOGUM BAY RD
Owner/Operator City,State,Zip: LACEY, WA 98506
Owner/Operator Telephone: 000-000-0000
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 19980210
Handler Name: HAZO DRUM SITE
Federal Waste Generator Description: Not a generator, verified
State District Owner: WA
Large Quantity Handler of Universal Waste: No

HAZO DRUM SITE (Continued) **1001226284**

Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	No
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

Receive Date:	19980210
Handler Name:	HAZO DRUM SITE
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	WA
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	No
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

Receive Date:	19980211
Handler Name:	HAZO DRUM SITE
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	WA
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

Receive Date:	19970814
Handler Name:	HAZO DRUM SITE
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	WA
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	No
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

Receive Date:	19980210
Handler Name:	HAZO DRUM SITE
Federal Waste Generator Description:	Small Quantity Generator
State District Owner:	WA
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	No

HAZO DRUM SITE (Continued) **1001226284**

Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

Receive Date: 19980210
Handler Name: HAZO DRUM SITE
Federal Waste Generator Description: Not a generator, verified
State District Owner: WA
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: No
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 92411
NAICS Description: ADMINISTRATION OF AIR AND WATER RESOURCE AND SOLID WASTE MANAGEMENT PROGRAMS

NAICS Code: Not reported
NAICS Description: Not reported

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

11
NNE
1/4-1/2
0.438 mi.
2312 ft.

TEC EQUIPMENT **ALLSITES S127485715**
2800 MARVIN ROAD NE **NPDES N/A**
LACEY, WA 98516

Relative: Higher

Actual: 233 ft.

ALLSITES:
Name: TEC EQUIPMENT
Facility Id: 81891

Interaction: 138631
Interaction 1: A
Interaction 2: CONSTSWGP
Ecology Program: WATQUAL
Program Data: PARIS
Facility Alt.: TEC Equipment
Program ID: WAR309980
Date Interaction: 2021-03-15 00:00:00
Date Interaction 3: Construction SW GP
Latitude: 47.070979881100001
Longitude: -122.772341578

NPDES:
Name: TEC EQUIPMENT

TEC EQUIPMENT (Continued) **S127485715**

Address:	2800 MARVIN ROAD NE
City,State,Zip:	LACEY, WA 98516
Facility Status:	Not reported
Facility Type:	Construction SW GP
Admin Region:	Headqarters
Date Issued:	11/18/2020
Latitude:	Not reported
Longitude:	Not reported
Permit ID:	WAR309980
Permit Version:	Not reported
Permit Status:	Active
Permit SubStatus:	Not reported
Ecology Contact:	Not reported
WRIA:	Not reported
Permit Expiration Date:	12/31/2025
Effective Date:	05/03/2021
Days to Expiration:	-1269

B12 **HAWKS PRAIRIE MARVIN RD DRUMS** **ALLSITES** **S109556706**
East **MARVIN & HAWKS PRAIRIE RDS N** **N/A**
1/4-1/2 **OLYMPIA, WA 98516**
0.439 mi.
2317 ft. **Site 3 of 3 in cluster B**

Relative:
Lower

Actual:
218 ft.

ALLSITES:

Name:	HAWKS PRAIRIE MARVIN RD DRUMS
Facility Id:	74423195

Interaction:	126349
Interaction 1:	A
Interaction 2:	HWOTHER
Ecology Program:	HAZWASTE
Program Data:	TURBOWASTE
Facility Alt.:	Hawks Prairie Marvin Rd Drums
Program ID:	WAH000005439
Date Interaction:	1998-12-31 00:00:00
Date Interaction 3:	Haz Waste Management Acti
Latitude:	47.065283550799997
Longitude:	-122.766441134

Interaction:	62011
Interaction 1:	I
Interaction 2:	HWG
Ecology Program:	HAZWASTE
Program Data:	TURBOWASTE
Facility Alt.:	Not reported
Program ID:	WAH000005439
Date Interaction:	1998-06-11 00:00:00
Date Interaction 3:	Hazardous Waste Generator
Latitude:	47.065283550799997
Longitude:	-122.766441134

13
ESE
1/4-1/2
0.475 mi.
2507 ft.

THURSTON CNTY LANDFILL
MARVIN RD
OLYMPIA, WA 98506

ALLSITES **1000369637**
RCRA NonGen / NLR **WAD000813139**

Relative:
Lower

Actual:
219 ft.

ALLSITES:

Name:	THURSTON CNTY LANDFILL
Facility Id:	12979222
Interaction:	27244
Interaction 1:	I
Interaction 2:	HWG
Ecology Program:	HAZWASTE
Program Data:	TURBOWASTE
Facility Alt.:	Not reported
Program ID:	WAD000813139
Date Interaction:	1980-08-18 00:00:00
Date Interaction 3:	Hazardous Waste Generator
Latitude:	47.062844458100002
Longitude:	-122.766335165

RCRA Listings:

Date Form Received by Agency:		19850315
Handler Name:	THURSTON CNTY LANDFILL	
Handler Address:		MARVIN RD
Handler City,State,Zip:		OLYMPIA, WA 98506
EPA ID:		WAD000813139
Contact Name:		Not reported
Contact Address:		Not reported
Contact City,State,Zip:		Not reported
Contact Telephone:		Not reported
Contact Fax:		Not reported
Contact Email:		Not reported
Contact Title:		Not reported
EPA Region:		10
Land Type:		Other
Federal Waste Generator Description:		Not a generator, verified
Non-Notifier:		Not reported
Biennial Report Cycle:		Not reported
Accessibility:		Not reported
Active Site Indicator:		Not reported
State District Owner:		WA
State District:		SWRO
Mailing Address:		2000 LAKERIDGE DR SW
Mailing City,State,Zip:		OLYMPIA, WA 98502
Owner Name:	THURSTON CNTY	
Owner Type:		Private
Operator Name:	THURSTON CNTY LANDFILL	
Operator Type:		Private
Short-Term Generator Activity:		No
Importer Activity:		No
Mixed Waste Generator:		No
Transporter Activity:		No
Transfer Facility Activity:		No
Recycler Activity with Storage:		No
Small Quantity On-Site Burner Exemption:		No
Smelting Melting and Refining Furnace Exemption:		No

THURSTON CNTY LANDFILL (Continued) **1000369637**

Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site Fed-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site Converter Treatment storage and Disposal Facility:	Not reported
Active Site State-Reg Treatment Storage and Disposal Facility:	Not reported
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	NN
Sub-Part K Indicator:	Not reported
Commercial TSD Indicator:	No
Treatment Storage and Disposal Type:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
Permit Renewals Workload Universe:	Not reported
Permit Workload Universe:	Not reported
Permit Progress Universe:	Not reported
Post-Closure Workload Universe:	Not reported
Closure Workload Universe:	Not reported
202 GPRA Corrective Action Baseline:	No
Corrective Action Workload Universe:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
TSDFs Potentially Subject to CA Under 3004 (u)/(v) Universe:	No
TSDFs Only Subject to CA under Discretionary Auth Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Operating TSDF Universe:	Not reported
Full Enforcement Universe:	Not reported
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20180508
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Operator
Owner/Operator Name: THURSTON CNTY LANDFILL	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	MARVIN RD
Owner/Operator City,State,Zip:	OLYMPIA, WA 98506

THURSTON CNTY LANDFILL (Continued) **1000369637**

Owner/Operator Telephone:	000-000-0000
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported
Owner/Operator Indicator:	Owner
Owner/Operator Name: THURSTON CNTY	
Legal Status:	Private
Date Became Current:	19960502
Date Ended Current:	Not reported
Owner/Operator Address:	2000 LAKERIDGE DR SW
Owner/Operator City,State,Zip:	OLYMPIA, WA 98502
Owner/Operator Telephone:	000-000-0000
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported
Owner/Operator Indicator:	Operator
Owner/Operator Name: THURSTON CNTY LANDFILL	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	MARVIN RD
Owner/Operator City,State,Zip:	OLYMPIA, WA 98506
Owner/Operator Telephone:	000-000-0000
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported
Owner/Operator Indicator:	Operator
Owner/Operator Name: THURSTON CNTY	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	2000 LAKERIDGE DR SW
Owner/Operator City,State,Zip:	OLYMPIA, WA 98502-6045
Owner/Operator Telephone:	000-000-0000
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported
Owner/Operator Indicator:	Owner
Owner/Operator Name: THURSTON CNTY	
Legal Status:	Private
Date Became Current:	19960502
Date Ended Current:	Not reported
Owner/Operator Address:	2000 LAKERIDGE DR SW
Owner/Operator City,State,Zip:	OLYMPIA, WA 98502
Owner/Operator Telephone:	000-000-0000
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported
Owner/Operator Indicator:	Owner
Owner/Operator Name: SEE PAPER COPY	
Legal Status:	Private
Date Became Current:	Not reported

THURSTON CNTY LANDFILL (Continued) **1000369637**

Date Ended Current:	Not reported
Owner/Operator Address:	MARVIN RD
Owner/Operator City,State,Zip:	OLYMPIA, WA 98506
Owner/Operator Telephone:	000-000-0000
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported
Owner/Operator Indicator:	Owner
Owner/Operator Name:	THURSTON CNTY LANDFILL
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	MARVIN RD
Owner/Operator City,State,Zip:	OLYMPIA, WA 98506
Owner/Operator Telephone:	000-000-0000
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported
Owner/Operator Indicator:	Owner
Owner/Operator Name:	THURSTON CNTY LANDFILL
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	MARVIN RD
Owner/Operator City,State,Zip:	OLYMPIA, WA 98506
Owner/Operator Telephone:	000-000-0000
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	19850314
Handler Name:	THURSTON CNTY LANDFILL
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	WA
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	No
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported
Receive Date:	19850315
Handler Name:	THURSTON CNTY LANDFILL
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	WA
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	Not reported

THURSTON CNTY LANDFILL (Continued) **1000369637**

Electronic Manifest Broker: Not reported

Receive Date: 19850314
Handler Name: THURSTON CNTY LANDFILL
Federal Waste Generator Description: Not a generator, verified
State District Owner: WA
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: No
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 562212
NAICS Description: SOLID WASTE LANDFILL

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

14
NNW
1/4-1/2
0.475 mi.
2510 ft.

PENSKE TRUCK LEASING CO LP LACEY **ALLSITES** **S123096253**
7647 BETTI LN **N/A**
LACEY, WA 98516

Relative: Higher

Actual: 245 ft.

ALLSITES:
Name: PENSKE TRUCK LEASING CO LP LACEY
Facility Id: 76492

Interaction: 127651
Interaction 1: A
Interaction 2: HWG
Ecology Program: HAZWASTE
Program Data: TURBOWASTE
Facility Alt.: Penske Truck Leasing Co LP Lacey
Program ID: WAH000055299
Date Interaction: 2018-08-10 00:00:00
Date Interaction 3: Hazardous Waste Generator
Latitude: 47.071983844599998
Longitude: -122.778044851

15
WSW
1/4-1/2
0.483 mi.
2549 ft.

CABELAS STORE 026
1600 GATEWAY BLVD NE
LACEY, WA 98516

ALLSITES
SPILLS
MANIFEST

S109010550
N/A

Relative:
Lower

Actual:
217 ft.

ALLSITES:

Name:	CABELAS LACEY RETAIL
Facility Id:	15034
Interaction:	106431
Interaction 1:	A
Interaction 2:	HWG
Ecology Program:	HAZWASTE
Program Data:	TURBOWASTE
Facility Alt.:	Cabelas Store 026
Program ID:	WAH000044324
Date Interaction:	2013-10-23 00:00:00
Date Interaction 3:	Hazardous Waste Generator
Latitude:	47.062398209100003
Longitude:	-122.785065754

Interaction:	99360
Interaction 1:	A
Interaction 2:	TIER2
Ecology Program:	HAZWASTE
Program Data:	EPCRA
Facility Alt.:	CABELAS LACEY RETAIL
Program ID:	CRK000078410
Date Interaction:	2012-01-17 00:00:00
Date Interaction 3:	Emergency/Haz Chem Rpt TI
Latitude:	47.062398209100003
Longitude:	-122.785065754

SPILLS:

Name:	CABELAS
Address:	1600 GATEWAY BLVD NE
City,State,Zip:	LACEY, WA
Facility ID:	9989
Medium:	Roadway - Paved
Material Desc:	Z-OTHER
Material Qty:	4
Material Units:	Other
Incident Date:	01/26/2008
Incident Category Type:	Non Oil
Incident Category:	Other Non-Oil
Latitude:	Not reported
Longitude:	Not reported
Source Type:	Not reported
Source:	Other Source-CONSTRUCTION SITE
Vessel Facility Name2:	Not reported
Recovered Quantity:	Not reported
Resp Party Contact:	UNKNOWN
Cause:	ERTS# 603488 - 01/26/2008
Cause Type:	Not reported
Resp Party Name:	Not reported
Medium Type:	Impermeable surface

CABELAS STORE 026 (Continued) **S109010550**

Contributing Factors: Not reported

SPILLS ERTS:

Facility Site ID:	Not reported
Name:	CABELAS
Address:	1600 GATEWAY BLVD NE
City,State,Zip:	LACEY, WA
Program Name:	Spill Prevention, Preparedness & Response
Incident ID:	603488
Incident Status:	Historic
Incident Date:	01/26/2008
Initial Report Activity Name:	Disposing
Initial Report Cause Category:	Human error
Initial Report Cause Name:	Dumping
Initial Report Medium Name:	Roadway-paved
Initial Report Medium Category:	Impermeable surface
Initial Report Source Name:	Illegal dump site
Initial Report Source Category:	Environment
Initial Report Substance Name:	Undetermined
Initial Report Substance Category:	Historical
Initial Report Substance Quantity:	4
Initial Report Substance Unit Of Measure:	Drum
Potentially Responsible Party First Name:	Not reported
Potentially Responsible Party Last Name:	UNKNOWN
Potentially Responsible Party Organization:	Not reported
External Reference Number:	Not reported
Latitude:	Not reported
Longitude:	Not reported

WA MANIFEST:

Name:	CABELAS STORE 026
Address:	1600 GATEWAY BLVD NE
City,State,Zip:	LACEY, WA 98516
Facility Address 2:	Not reported
Facility ID:	15034
EPA ID:	WAH000044324
NAICS:	423910
State Waste Code Desc:	Not reported
Federal Waste Code Desc:	D001,D002,D035,D003,D018,D030
Form Comm:	Not reported
Data Year:	2017
Permit by Rule:	False
Mailing Address 2:	Not reported
Treatment by Generator:	False
Mixed Radioactive Waste:	False
Importer of Hazardous Waste:	False
Immediate Recycler:	False
Treatment/Storage/Disposal/Recycling Facility:	False
Generator of Dangerous Fuel Waste:	False
Generator Marketing to Burner:	False
Other Marketers (i.e., blender, distributor, etc.):	False
Utility Boiler Burner:	False
Industry Boiler Burner:	False
Industrial Furnace:	False
Smelter Defferal:	False
Universal Waste:	Not reported

CABELAS STORE 026 (Continued) **S109010550**

Off-Specification:	Not reported
LN Address 2:	Not reported
Tax Reg #:	602823536
Business Type:	Not reported
Mail Name:	Not reported
Mailing Address:	2500 E. Kearney
Mailing City,State,Zip:	SPRINGFIELD, MO 65898
Legal Organization Name:	Cabelas LLC
Legal Organization Type:	Private
Legal Contact:	Not reported
Legal Address:	One Cabela Dr
Legal Address 2:	Not reported
Legal City,State,Zip:	Sidney, NE 69160
Legal Phone Number:	(308)254-5505
Legal Effective Date:	11/10/2008
Land Organization Name:	Vereit Cab Portfolio, LLC
Land Organization Type:	Private
Land Contact:	Not reported
Land Address:	2325 East Camelback Road, Suit
Land City,State,Zip:	Phoenix, AZ 85016
Land Phone Number:	(602)778-8700
Operator Organization Name:	Cabelas Store 026
Operator Organization Type:	Private
Operator:	Not reported
Operator Address:	1600 Gateway Blvd NE
Operator Address 2:	Not reported
Operator City,State,Zip:	Lacey, WA 98516
Operator Phone Number:	(417) 873-5251
Operator Effective Date:	11/10/2008
Site Contact:	Not reported
Site Contact Address:	Not reported
Contact City,State,Zip:	Not reported
Site Contact Phone Number:	Not reported
Site Contact Email:	Not reported
Gen Status Code:	SQG
Monthly Generation:	True
Batch Generation:	False
One Time Generation:	False
Transport Own Waste:	False
Tranports Other Waste:	False
Recycler Onsite:	False
Transfer Facility:	False
Other Exemption:	Not reported
UW Battery Gen:	False
Used Oil Transporter:	False
Used Oil Transfer Facility:	False
Used Oil Processor:	False
Used Oil Refiner:	False
Used Oil Fuel Marketer Directs Shipments:	False
Used Oil Fuel Marketer Meets Specs:	False
Site Contact Address 2:	Not reported
SIC Code:	Not reported
CRK Number:	Not reported
Active:	Not reported
CAS Number:	Not reported
Chemical Name:	Not reported
EHS:	Not reported

CABELAS STORE 026 (Continued) **S109010550**

EHS CAS Number:	Not reported
EHS Name:	Not reported
Name:	CABELAS STORE 026
Address:	1600 GATEWAY BLVD NE
City,State,Zip:	LACEY, WA 98516
Facility Address 2:	Not reported
Facility ID:	15034
EPA ID:	WAH000044324
NAICS:	423910
State Waste Code Desc:	WT02
Federal Waste Code Desc:	D001,D002,D003,D008,D016,D031,D035
Form Comm:	Not reported
Data Year:	2017
Permit by Rule:	False
Mailing Address 2:	Not reported
Treatment by Generator:	False
Mixed Radioactive Waste:	False
Importer of Hazardous Waste:	False
Immediate Recycler:	False
Treatment/Storage/Disposal/Recycling Facility:	False
Generator of Dangerous Fuel Waste:	False
Generator Marketing to Burner:	False
Other Marketers (i.e., blender, distributor, etc.):	False
Utility Boiler Burner:	False
Industry Boiler Burner:	False
Industrial Furnace:	False
Smelter Defferal:	False
Universal Waste:	Not reported
Off-Specification:	Not reported
LN Address 2:	Not reported
Tax Reg #:	602823536
Business Type:	Sporting goods retailer
Mail Name:	Cabelas Store 026
Mailing Address:	1600 Gateway Blvd NE
Mailing City,State,Zip:	Lacey, WA 98516
Legal Organization Name:	Cabelas Wholesale Inc
Legal Organization Type:	Private
Legal Contact:	Not reported
Legal Address:	One Cabela Dr
Legal Address 2:	Not reported
Legal City,State,Zip:	Sidney, NE 69160
Legal Phone Number:	308-254-5505
Legal Effective Date:	11/10/2008
Land Organization Name:	Vereit Cab Portfolio, LLC
Land Organization Type:	Private
Land Contact:	Not reported
Land Address:	2325 East Camelback Road, Suit
Land City,State,Zip:	Phoenix, AZ 85016
Land Phone Number:	602-778-8700
Operator Organization Name:	Cabelas Store 026
Operator Organization Type:	Private
Operator:	Josh Anderson
Operator Address:	1600 Gateway Blvd NE
Operator Address 2:	Not reported
Operator City,State,Zip:	Lacey, WA 98516
Operator Phone Number:	360-252-3500

CABELAS STORE 026 (Continued) **S109010550**

Operator Effective Date:	11/10/2008
Site Contact:	Joseph Burgess
Site Contact Address:	1600 Gateway Blvd NE
Contact City,State,Zip:	Lacey, WA 98516
Site Contact Phone Number:	360-252-3500 ext. 8020
Site Contact Email:	Joseph.Burgess@cabelas.com
Gen Status Code:	SQG
Monthly Generation:	True
Batch Generation:	False
One Time Generation:	False
Transport Own Waste:	False
Tranports Other Waste:	False
Recycler Onsite:	False
Transfer Facility:	False
Other Exemption:	Not reported
UW Battery Gen:	False
Used Oil Transporter:	False
Used Oil Transfer Facility:	False
Used Oil Processor:	False
Used Oil Refiner:	False
Used Oil Fuel Marketer Directs Shipments:	False
Used Oil Fuel Marketer Meets Specs:	False
Site Contact Address 2:	Not reported
SIC Code:	Not reported
CRK Number:	Not reported
Active:	Not reported
CAS Number:	Not reported
Chemical Name:	Not reported
EHS:	Not reported
EHS CAS Number:	Not reported
EHS Name:	Not reported

Name:	CABELAS STORE 026
Address:	1600 GATEWAY BLVD NE
City,State,Zip:	LACEY, WA 98516
Facility Address 2:	Not reported
Facility ID:	15034
EPA ID:	WAH000044324
NAICS:	423910
State Waste Code Desc:	Not reported
Federal Waste Code Desc:	D001,D002,D003,D005,D008,D009,D018,D030,D035
Form Comm:	Not reported
Data Year:	2016
Permit by Rule:	False
Mailing Address 2:	Not reported
Treatment by Generator:	False
Mixed Radioactive Waste:	False
Importer of Hazardous Waste:	False
Immediate Recycler:	False
Treatment/Storage/Disposal/Recycling Facility:	False
Generator of Dangerous Fuel Waste:	False
Generator Marketing to Burner:	False
Other Marketers (i.e., blender, distributor, etc.):	False
Utility Boiler Burner:	False
Industry Boiler Burner:	False
Industrial Furnace:	False
Smelter Defferal:	False

CABELAS STORE 026 (Continued) **S109010550**

Universal Waste:	Not reported
Off-Specification:	Not reported
LN Address 2:	Not reported
Tax Reg #:	602823536
Business Type:	Sporting goods retailer
Mail Name:	Cabelas Store 026
Mailing Address:	1600 Gateway Blvd NE
Mailing City,State,Zip:	Lacey, WA 98516
Legal Organization Name:	Cabelas Wholesale Inc
Legal Organization Type:	Private
Legal Contact:	Not reported
Legal Address:	One Cabela Dr
Legal Address 2:	Not reported
Legal City,State,Zip:	Sidney, NE 69160
Legal Phone Number:	308-254-5505
Legal Effective Date:	11/10/2008
Land Organization Name:	Cabelas Wholesale Inc
Land Organization Type:	Private
Land Contact:	Not reported
Land Address:	One Cabela Dr
Land City,State,Zip:	Sidney, NE 69160
Land Phone Number:	308-254-5505
Operator Organization Name:	Cabelas Store 026
Operator Organization Type:	Private
Operator:	Josh Anderson
Operator Address:	1600 Gateway Blvd NE
Operator Address 2:	Not reported
Operator City,State,Zip:	Lacey, WA 98516
Operator Phone Number:	360-252-3500
Operator Effective Date:	11/10/2008
Site Contact:	Joseph Burgess
Site Contact Address:	1600 Gateway Blvd NE
Contact City,State,Zip:	Lacey, WA 98516
Site Contact Phone Number:	360-252-3500 ext. 8020
Site Contact Email:	Joseph.Burgess@cabelas.com
Gen Status Code:	SQG
Monthly Generation:	True
Batch Generation:	False
One Time Generation:	False
Transport Own Waste:	False
Tranports Other Waste:	False
Recycler Onsite:	False
Transfer Facility:	False
Other Exemption:	Not reported
UW Battery Gen:	False
Used Oil Transporter:	False
Used Oil Transfer Facility:	False
Used Oil Processor:	False
Used Oil Refiner:	False
Used Oil Fuel Marketer Directs Shipments:	False
Used Oil Fuel Marketer Meets Specs:	False
Site Contact Address 2:	Not reported
SIC Code:	Not reported
CRK Number:	Not reported
Active:	Not reported
CAS Number:	Not reported
Chemical Name:	Not reported

CABELAS STORE 026 (Continued) **S109010550**

EHS:	Not reported
EHS CAS Number:	Not reported
EHS Name:	Not reported
Name:	CABELAS STORE 026
Address:	1600 GATEWAY BLVD NE
City,State,Zip:	LACEY, WA 98516
Facility Address 2:	Not reported
Facility ID:	15034
EPA ID:	WAH000044324
NAICS:	423910
State Waste Code Desc:	Not reported
Federal Waste Code Desc:	D001,D002,D003,D005,D008,D009,D030,D035
Form Comm:	Not reported
Data Year:	2015
Permit by Rule:	False
Mailing Address 2:	Not reported
Treatment by Generator:	False
Mixed Radioactive Waste:	False
Importer of Hazardous Waste:	False
Immediate Recycler:	False
Treatment/Storage/Disposal/Recycling Facility:	False
Generator of Dangerous Fuel Waste:	False
Generator Marketing to Burner:	False
Other Marketers (i.e., blender, distributor, etc.):	False
Utility Boiler Burner:	False
Industry Boiler Burner:	False
Industrial Furnace:	False
Smelter Defferal:	False
Universal Waste:	Not reported
Off-Specification:	Not reported
LN Address 2:	Not reported
Tax Reg #:	602823536
Business Type:	Sporting goods retailer
Mail Name:	Cabelas Store 026
Mailing Address:	1600 Gateway Blvd NE
Mailing City,State,Zip:	Lacey, WA 98516
Legal Organization Name:	Cabelas Wholesale Inc
Legal Organization Type:	Private
Legal Contact:	Not reported
Legal Address:	One Cabela Dr
Legal Address 2:	Not reported
Legal City,State,Zip:	Sidney, NE 69160
Legal Phone Number:	308-254-5505
Legal Effective Date:	11/10/2008
Land Organization Name:	Cabelas Wholesale Inc
Land Organization Type:	Private
Land Contact:	Not reported
Land Address:	One Cabela Dr
Land City,State,Zip:	Sidney, NE 69160
Land Phone Number:	308-254-5505
Operator Organization Name:	Cabelas Store 026
Operator Organization Type:	Private
Operator:	JB Redd
Operator Address:	1600 Gateway Blvd NE
Operator Address 2:	Not reported
Operator City,State,Zip:	Lacey, WA 98516

CABELAS STORE 026 (Continued) **S109010550**

Operator Phone Number:	360-252-3500
Operator Effective Date:	11/10/2008
Site Contact:	JB Redd
Site Contact Address:	1600 Gateway Blvd NE
Contact City,State,Zip:	Lacey, WA 98516
Site Contact Phone Number:	360-252-3500 ext. 8020
Site Contact Email:	JB.Redd@cabelas.com
Gen Status Code:	SQG
Monthly Generation:	True
Batch Generation:	False
One Time Generation:	False
Transport Own Waste:	False
Tranports Other Waste:	False
Recycler Onsite:	False
Transfer Facility:	False
Other Exemption:	Not reported
UW Battery Gen:	False
Used Oil Transporter:	False
Used Oil Transfer Facility:	False
Used Oil Processor:	False
Used Oil Refiner:	False
Used Oil Fuel Marketer Directs Shipments:	False
Used Oil Fuel Marketer Meets Specs:	False
Site Contact Address 2:	Not reported
SIC Code:	Not reported
CRK Number:	Not reported
Active:	Not reported
CAS Number:	Not reported
Chemical Name:	Not reported
EHS:	Not reported
EHS CAS Number:	Not reported
EHS Name:	Not reported

Name:	CABELAS STORE 026
Address:	1600 GATEWAY BLVD NE
City,State,Zip:	LACEY, WA 98516
Facility Address 2:	Not reported
Facility ID:	15034
EPA ID:	WAH000044324
NAICS:	423910
State Waste Code Desc:	Not reported
Federal Waste Code Desc:	D001,D035
Form Comm:	Not reported
Data Year:	2014
Permit by Rule:	False
Mailing Address 2:	Not reported
Treatment by Generator:	False
Mixed Radioactive Waste:	False
Importer of Hazardous Waste:	False
Immediate Recycler:	False
Treatment/Storage/Disposal/Recycling Facility:	False
Generator of Dangerous Fuel Waste:	False
Generator Marketing to Burner:	False
Other Marketers (i.e., blender, distributor, etc.):	False
Utility Boiler Burner:	False
Industry Boiler Burner:	False
Industrial Furnace:	False

CABELAS STORE 026 (Continued) **S109010550**

Smelter Defferal:	False
Universal Waste:	Not reported
Off-Specification:	Not reported
LN Address 2:	Not reported
Tax Reg #:	602823536
Business Type:	Sporting goods retailer
Mail Name:	Cabelas Store 026
Mailing Address:	1600 Gateway Blvd NE
Mailing City,State,Zip:	Lacey, WA 98516
Legal Organization Name:	Cabelas Wholesale Inc
Legal Organization Type:	Private
Legal Contact:	Not reported
Legal Address:	One Cabela Dr
Legal Address 2:	Not reported
Legal City,State,Zip:	Sidney, NE 69160
Legal Phone Number:	308-254-5505
Legal Effective Date:	11/10/2008
Land Organization Name:	Cabelas Wholesale Inc
Land Organization Type:	Private
Land Contact:	Not reported
Land Address:	One Cabela Dr
Land City,State,Zip:	Sidney, NE 69160
Land Phone Number:	308-254-5505
Operator Organization Name:	Cabelas Store 026
Operator Organization Type:	Private
Operator:	Not reported
Operator Address:	1600 Gateway Blvd NE
Operator Address 2:	Not reported
Operator City,State,Zip:	Lacey, WA 98516
Operator Phone Number:	360-252-3500
Operator Effective Date:	11/10/2008
Site Contact:	JB Redd
Site Contact Address:	1600 Gateway Blvd NE
Contact City,State,Zip:	Lacey, WA 98516
Site Contact Phone Number:	360-252-3500 ext. 8020
Site Contact Email:	tom.prewitt@cabelas.com
Gen Status Code:	SQG
Monthly Generation:	True
Batch Generation:	False
One Time Generation:	False
Transport Own Waste:	False
Tranports Other Waste:	False
Recycler Onsite:	False
Transfer Facility:	False
Other Exemption:	Not reported
UW Battery Gen:	False
Used Oil Transporter:	False
Used Oil Transfer Facility:	False
Used Oil Processor:	False
Used Oil Refiner:	False
Used Oil Fuel Marketer Directs Shipments:	False
Used Oil Fuel Marketer Meets Specs:	False
Site Contact Address 2:	Not reported
SIC Code:	Not reported
CRK Number:	Not reported
Active:	Not reported
CAS Number:	Not reported

CABELAS STORE 026 (Continued) **S109010550**

Chemical Name:	Not reported
EHS:	Not reported
EHS CAS Number:	Not reported
EHS Name:	Not reported
Name:	CABELAS STORE 026
Address:	1600 GATEWAY BLVD NE
City,State,Zip:	LACEY, WA 98516
Facility Address 2:	Not reported
Facility ID:	15034
EPA ID:	WAH000044324
NAICS:	423910
State Waste Code Desc:	Not reported
Federal Waste Code Desc:	D001, D002, D003, D030, D035,
Form Comm:	Not reported
Data Year:	2013
Permit by Rule:	False
Mailing Address 2:	Not reported
Treatment by Generator:	False
Mixed Radioactive Waste:	False
Importer of Hazardous Waste:	False
Immediate Recycler:	False
Treatment/Storage/Disposal/Recycling Facility:	False
Generator of Dangerous Fuel Waste:	False
Generator Marketing to Burner:	False
Other Marketers (i.e., blender, distributor, etc.):	False
Utility Boiler Burner:	False
Industry Boiler Burner:	False
Industrial Furnace:	False
Smelter Defferal:	False
Universal Waste:	Lamps - Generate
Off-Specification:	Not reported
LN Address 2:	Not reported
Tax Reg #:	602823536
Business Type:	Sporting goods retailer
Mail Name:	Cabelas Store 026
Mailing Address:	1600 Gateway Blvd NE
Mailing City,State,Zip:	Lacey, WA 98516
Legal Organization Name:	Cabelas Wholesale Inc
Legal Organization Type:	Private
Legal Contact:	Not reported
Legal Address:	One Cabela Dr
Legal Address 2:	Not reported
Legal City,State,Zip:	Sidney, NE 69160
Legal Phone Number:	308-254-5505
Legal Effective Date:	11/10/2008
Land Organization Name:	Cabelas Wholesale Inc
Land Organization Type:	Private
Land Contact:	Not reported
Land Address:	One Cabela Dr
Land City,State,Zip:	Sidney, NE 69160
Land Phone Number:	308-254-5505
Operator Organization Name:	Cabelas Store 026
Operator Organization Type:	Private
Operator:	Not reported
Operator Address:	1600 Gateway Blvd NE
Operator Address 2:	Not reported

CABELAS STORE 026 (Continued) **S109010550**

Operator City,State,Zip:	Lacey, WA 98516
Operator Phone Number:	360-252-3500
Operator Effective Date:	11/10/2008
Site Contact:	Tom Prewitt
Site Contact Address:	1600 Gateway Blvd NE
Contact City,State,Zip:	Lacey, WA 98516
Site Contact Phone Number:	360-252-3500
Site Contact Email:	tom.prewitt@cabelas.com
Gen Status Code:	SQG
Monthly Generation:	False
Batch Generation:	True
One Time Generation:	False
Transport Own Waste:	False
Tranports Other Waste:	False
Recycler Onsite:	False
Transfer Facility:	False
Other Exemption:	Not reported
UW Battery Gen:	True
Used Oil Transporter:	False
Used Oil Transfer Facility:	False
Used Oil Processor:	False
Used Oil Refiner:	False
Used Oil Fuel Marketer Directs Shipments:	False
Used Oil Fuel Marketer Meets Specs:	False
Site Contact Address 2:	Not reported
SIC Code:	Not reported
CRK Number:	Not reported
Active:	Not reported
CAS Number:	Not reported
Chemical Name:	Not reported
EHS:	Not reported
EHS CAS Number:	Not reported
EHS Name:	Not reported

16
SSW
1/2-1
0.927 mi.
4894 ft.

TANGLE WILD ARCO
7291 MARTIN WAY E
OLYMPIA, WA 98516

HSL **U003354719**
CSCSL **N/A**
LUST
UST
ALLSITES

Relative:
Lower

Actual:
201 ft.

HSL:

Name:	TANGLEWILDE CHEVRON
Address:	Not reported
City,State,Zip:	OLYMPIA, WA
edr_fstat:	WA
edr_fzip:	Not reported
edr_fcnty:	THURSTON
edr_zip:	Not reported
Facility Type:	**Hazardous Sites List**
Facility Status:	Cleanup Started
FSID Number:	75957582
Rank:	3
Region:	SW
EDR Link ID:	75957582
Region Decode:	SOUTHWEST REGIONAL OFFICE

CSCSL:

TANGLE WILD ARCO (Continued) **U003354719**

Name: TANGLEWILDE CHEVRON
Address: 7291 MARTIN WAY E
City,State,Zip: OLYMPIA, WA 98516
Facility ID: 75957582
Region: Southwest
Lat/Long: 47.05281876 / -122.78303681
Clean Up Siteid: 6636
Site Status: Cleanup Started
Contaminant Name: Petroleum Products-Unspecified
Alternate Site Names: Chevron SS 94486,CHEVRON USA 94486,TANGLE WILD ARCO,Tanglewilde Valero
Site Rank: 3 - Moderate Risk
Has Institutional Control: Not reported
Past VCP: TRUE
Current VCP: Not reported
URL: https://apps.ecology.wa.gov/cleanupsearch/site/6636
Ground Water: Not reported
Surface Water: Not reported
Soil: Confirmed Above Cleanup Levels
Sediment: Not reported
Air: Not reported
Bedrock: Not reported
Responsible Unit: Southwest

Name: TANGLEWILDE CHEVRON
Address: 7291 MARTIN WAY E
City,State,Zip: OLYMPIA, WA 98516
Facility ID: 75957582
Region: Southwest
Lat/Long: 47.05281876 / -122.78303681
Clean Up Siteid: 6636
Site Status: Cleanup Started
Contaminant Name: Petroleum-Other
Alternate Site Names: Chevron SS 94486,CHEVRON USA 94486,TANGLE WILD ARCO,Tanglewilde Valero
Site Rank: 3 - Moderate Risk
Has Institutional Control: Not reported
Past VCP: TRUE
Current VCP: Not reported
URL: https://apps.ecology.wa.gov/cleanupsearch/site/6636
Ground Water: Confirmed Above Cleanup Levels
Surface Water: Not reported
Soil: Not reported
Sediment: Not reported
Air: Not reported
Bedrock: Not reported
Responsible Unit: Southwest

LUST:
Name: TANGLEWILDE CHEVRON
Address: 7291 MARTIN WAY E
City,State,Zip: OLYMPIA, WA 98516
Facility ID: 75957582
Lust Status Type: LUST - Monitoring
Cleanup Site ID: 6636
Cleanup Unit Type: Upland
Process Type: Independent Action
Cleanup Unit Name: Chevron SS 94486,CHEVRON USA 94486,TANGLE WILD ARCO,Tanglewilde Valero
Response Section: Southwest

TANGLE WILD ARCO (Continued) **U003354719**

Release Date: 10/02/2000
Lust Date: 02/01/2000
Region: Southwest
Lust ID: 5564
UST ID: 5165
Contaminant Name: Petroleum Products-Unspecified
Ground Water: Not reported
Surface Water: Not reported
Soil: Confirmed Above Cleanup Levels
Sediment: Not reported
Air: Not reported
Bedrock: Not reported
URL: https://apps.ecology.wa.gov/cleanupsearch/site/6636
Lat/Long: 47.0528187 / -122.78303

Name: TANGLEWILDE CHEVRON
Address: 7291 MARTIN WAY E
City,State,Zip: OLYMPIA, WA 98516
Facility ID: 75957582
Lust Status Type: LUST - Monitoring
Cleanup Site ID: 6636
Cleanup Unit Type: Upland
Process Type: Independent Action
Cleanup Unit Name: Chevron SS 94486,CHEVRON USA 94486,TANGLE WILD ARCO,Tanglewilde Valero
Response Section: Southwest
Release Date: 10/02/2000
Lust Date: 02/01/2000
Region: Southwest
Lust ID: 5564
UST ID: 5165
Contaminant Name: Petroleum-Other
Ground Water: Confirmed Above Cleanup Levels
Surface Water: Not reported
Soil: Not reported
Sediment: Not reported
Air: Not reported
Bedrock: Not reported
URL: https://apps.ecology.wa.gov/cleanupsearch/site/6636
Lat/Long: 47.0528187 / -122.78303

UST:
Name: TANGLE WILD ARCO
Address: 7291 MARTIN WAY E
City: OLYMPIA
Zip: 98516
Facility ID: 75957582
Site Id: 5165
Decimal Latitude: 47.05281876
Decimal Longitude: -122.78303681

Tank Name: 1
Tag Number: A0731
Tank Status: Removed
Tank Status Date: 8/6/1996
Tank Install Date: 12/31/1964
Tank Closure Date: Not reported
Capacity Range: Not reported

TANGLE WILD ARCO (Continued) **U003354719**

Tank Permit Expiration Date:	Not reported
Tank Upgrade Date:	Not reported
Tank Spill Prevention:	Not reported
Tank Overfill Prevention:	Not reported
Tank Material:	Steel
Tank Construction:	Single Wall Tank
Tank Tightness Test:	Not reported
Tank Corrosion Protection:	Not reported
Tank Manifold:	Not reported
Tank Release Detection:	Not reported
Tank SFC Type:	Not reported
Pipe Material:	Not reported
Pipe Construction:	Not reported
Pipe Primary Release Detection:	Not reported
Pipe Second Release Detection:	Not reported
Pipe Corrosion Protection:	Not reported
Pipe Pumping System:	Not reported
Responsible Unit:	Southwest
Dispencer/Pump SFC Type:	Not reported
Region:	Southwest
Is Active:	True
Actual Capacity:	Not reported
Pipe Install Date:	Not reported
Turbine Sump Construction:	Not reported
Compart Number:	1
Stored Substance:	Unleaded Gasoline
Used Substance:	Not reported
Compart Capacity:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/reports/ust?SiteId=5165
Name:	TANGLE WILD ARCO
Address:	7291 MARTIN WAY E
City:	OLYMPIA
Zip:	98516
Tank Name:	2
Tag Number:	A0731
Tank Status:	Removed
Tank Status Date:	8/6/1996
Tank Install Date:	12/31/1964
Tank Closure Date:	Not reported
Capacity Range:	Not reported
Tank Permit Expiration Date:	Not reported
Tank Upgrade Date:	Not reported
Tank Spill Prevention:	Not reported
Tank Overfill Prevention:	Not reported
Tank Material:	Steel
Tank Construction:	Single Wall Tank
Tank Tightness Test:	Not reported
Tank Corrosion Protection:	Not reported
Tank Manifold:	Not reported
Tank Release Detection:	Not reported
Tank SFC Type:	Not reported
Pipe Material:	Not reported
Pipe Construction:	Not reported
Pipe Primary Release Detection:	Not reported
Pipe Second Release Detection:	Not reported

TANGLE WILD ARCO (Continued) **U003354719**

Pipe Corrosion Protection:	Not reported
Pipe Pumping System:	Not reported
Responsible Unit:	Southwest
Dispencer/Pump SFC Type:	Not reported
Region:	Southwest
Is Active:	True
Actual Capacity:	Not reported
Pipe Install Date:	Not reported
Turbine Sump Construction:	Not reported
Compart Number:	1
Stored Substance:	Unleaded Gasoline
Used Substance:	Not reported
Compart Capacity:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/reports/ust?SiteId=5165

Name:	TANGLE WILD ARCO
Address:	7291 MARTIN WAY E
City:	OLYMPIA
Zip:	98516

Tank Name:	3
Tag Number:	A0731
Tank Status:	Removed
Tank Status Date:	8/6/1996
Tank Install Date:	12/31/1964
Tank Closure Date:	Not reported
Capacity Range:	Not reported
Tank Permit Expiration Date:	Not reported
Tank Upgrade Date:	Not reported
Tank Spill Prevention:	Not reported
Tank Overfill Prevention:	Not reported
Tank Material:	Steel
Tank Construction:	Single Wall Tank
Tank Tightness Test:	Not reported
Tank Corrosion Protection:	Not reported
Tank Manifold:	Not reported
Tank Release Detection:	Not reported
Tank SFC Type:	Not reported
Pipe Material:	Not reported
Pipe Construction:	Not reported
Pipe Primary Release Detection:	Not reported
Pipe Second Release Detection:	Not reported
Pipe Corrosion Protection:	Not reported
Pipe Pumping System:	Not reported
Responsible Unit:	Southwest
Dispencer/Pump SFC Type:	Not reported
Region:	Southwest
Is Active:	True
Actual Capacity:	Not reported
Pipe Install Date:	Not reported
Turbine Sump Construction:	Not reported
Compart Number:	1
Stored Substance:	Unleaded Gasoline
Used Substance:	Not reported
Compart Capacity:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/reports/ust?SiteId=5165

TANGLE WILD ARCO (Continued) **U003354719**

Name:	TANGLE WILD ARCO
Address:	7291 MARTIN WAY E
City:	OLYMPIA
Zip:	98516
Tank Name:	4
Tag Number:	A0731
Tank Status:	Removed
Tank Status Date:	8/6/1996
Tank Install Date:	12/31/1964
Tank Closure Date:	Not reported
Capacity Range:	Not reported
Tank Permit Expiration Date:	Not reported
Tank Upgrade Date:	Not reported
Tank Spill Prevention:	Not reported
Tank Overfill Prevention:	Not reported
Tank Material:	Steel
Tank Construction:	Single Wall Tank
Tank Tightness Test:	Not reported
Tank Corrosion Protection:	Not reported
Tank Manifold:	Not reported
Tank Release Detection:	Not reported
Tank SFC Type:	Not reported
Pipe Material:	Not reported
Pipe Construction:	Not reported
Pipe Primary Release Detection:	Not reported
Pipe Second Release Detection:	Not reported
Pipe Corrosion Protection:	Not reported
Pipe Pumping System:	Not reported
Responsible Unit:	Southwest
Dispencer/Pump SFC Type:	Not reported
Region:	Southwest
Is Active:	True
Actual Capacity:	Not reported
Pipe Install Date:	Not reported
Turbine Sump Construction:	Not reported
Compart Number:	1
Stored Substance:	Leaded Gasoline
Used Substance:	Not reported
Compart Capacity:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/reports/ust?SiteId=5165
Name:	TANGLE WILD ARCO
Address:	7291 MARTIN WAY E
City:	OLYMPIA
Zip:	98516
Tank Name:	5
Tag Number:	A0731
Tank Status:	Exempt - Removed
Tank Status Date:	8/6/1996
Tank Install Date:	12/31/1964
Tank Closure Date:	Not reported
Capacity Range:	111 TO 1,100 Gallons
Tank Permit Expiration Date:	Not reported
Tank Upgrade Date:	Not reported
Tank Spill Prevention:	Not reported

TANGLE WILD ARCO (Continued) **U003354719**

Tank Overfill Prevention:	Not reported
Tank Material:	Not reported
Tank Construction:	Single Wall Tank
Tank Tightness Test:	Not reported
Tank Corrosion Protection:	Not reported
Tank Manifold:	Not reported
Tank Release Detection:	Not reported
Tank SFC Type:	Not reported
Pipe Material:	Not reported
Pipe Construction:	Not reported
Pipe Primary Release Detection:	Not reported
Pipe Second Release Detection:	Not reported
Pipe Corrosion Protection:	Not reported
Pipe Pumping System:	Not reported
Responsible Unit:	Southwest
Dispencer/Pump SFC Type:	Not reported
Region:	Southwest
Is Active:	True
Actual Capacity:	Not reported
Pipe Install Date:	Not reported
Turbine Sump Construction:	Not reported
Compart Number:	1
Stored Substance:	Not reported
Used Substance:	Not reported
Compart Capacity:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/reports/ust?SiteId=5165
Name:	TANGLE WILD ARCO
Address:	7291 MARTIN WAY E
City:	OLYMPIA
Zip:	98516
Tank Name:	6
Tag Number:	A0731
Tank Status:	Removed
Tank Status Date:	8/6/1996
Tank Install Date:	12/31/1964
Tank Closure Date:	Not reported
Capacity Range:	111 TO 1,100 Gallons
Tank Permit Expiration Date:	Not reported
Tank Upgrade Date:	Not reported
Tank Spill Prevention:	Not reported
Tank Overfill Prevention:	Not reported
Tank Material:	Steel
Tank Construction:	Single Wall Tank
Tank Tightness Test:	Not reported
Tank Corrosion Protection:	Not reported
Tank Manifold:	Not reported
Tank Release Detection:	Not reported
Tank SFC Type:	Not reported
Pipe Material:	Not reported
Pipe Construction:	Not reported
Pipe Primary Release Detection:	Not reported
Pipe Second Release Detection:	Not reported
Pipe Corrosion Protection:	Not reported
Pipe Pumping System:	Not reported
Responsible Unit:	Southwest

TANGLE WILD ARCO (Continued) **U003354719**

Dispencer/Pump SFC Type:	Not reported
Region:	Southwest
Is Active:	True
Actual Capacity:	Not reported
Pipe Install Date:	Not reported
Turbine Sump Construction:	Not reported
Compart Number:	1
Stored Substance:	Used Oil/Waste Oil
Used Substance:	Not reported
Compart Capacity:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/reports/ust?SiteId=5165
Name:	TANGLE WILD ARCO
Address:	7291 MARTIN WAY E
City:	OLYMPIA
Zip:	98516
Tank Name:	Not reported
Tag Number:	A0731
Tank Status:	Operational
Tank Status Date:	8/6/1996
Tank Install Date:	3/1/1988
Tank Closure Date:	Not reported
Capacity Range:	5,000 to 9,999 Gallons
Tank Permit Expiration Date:	11/30/2022
Tank Upgrade Date:	3/1/1988
Tank Spill Prevention:	Spill Bucket/Spill Box
Tank Overfill Prevention:	Automatic Shutoff (fill pipe)
Tank Material:	Fiberglass Reinforced Plastic
Tank Construction:	Double Wall Tank
Tank Tightness Test:	Part of Automatic Tank Gauging (ATG) System
Tank Corrosion Protection:	Corrosion Resistant
Tank Manifold:	Not reported
Tank Release Detection:	Automatic Tank Gauging
Tank SFC Type:	Not reported
Pipe Material:	Fiberglass
Pipe Construction:	Double Wall Pipe
Pipe Primary Release Detection:	Automatic Line Leak Detector (ALLD)
Pipe Second Release Detection:	Not reported
Pipe Corrosion Protection:	Corrosion Resistant
Pipe Pumping System:	Pressurized System
Responsible Unit:	Southwest
Dispencer/Pump SFC Type:	Not reported
Region:	Southwest
Is Active:	True
Actual Capacity:	10000
Pipe Install Date:	Not reported
Turbine Sump Construction:	Not reported
Compart Number:	1
Stored Substance:	Unleaded Gasoline
Used Substance:	Motor Fuel for Vehicles
Compart Capacity:	10000
URL:	https://apps.ecology.wa.gov/cleanupsearch/reports/ust?SiteId=5165
Name:	TANGLE WILD ARCO
Address:	7291 MARTIN WAY E
City:	OLYMPIA

TANGLE WILD ARCO (Continued) **U003354719**

Zip:	98516
Tank Name:	Not reported
Tag Number:	A0731
Tank Status:	Operational
Tank Status Date:	8/6/1996
Tank Install Date:	3/1/1988
Tank Closure Date:	Not reported
Capacity Range:	5,000 to 9,999 Gallons
Tank Permit Expiration Date:	11/30/2022
Tank Upgrade Date:	3/1/1988
Tank Spill Prevention:	Spill Bucket/Spill Box
Tank Overfill Prevention:	Automatic Shutoff (fill pipe)
Tank Material:	Fiberglass Reinforced Plastic
Tank Construction:	Double Wall Tank
Tank Tightness Test:	Part of Automatic Tank Gauging (ATG) System
Tank Corrosion Protection:	Corrosion Resistant
Tank Manifold:	Not reported
Tank Release Detection:	Automatic Tank Gauging
Tank SFC Type:	Not reported
Pipe Material:	Fiberglass
Pipe Construction:	Double Wall Pipe
Pipe Primary Release Detection:	Automatic Line Leak Detector (ALLD)
Pipe Second Release Detection:	Not reported
Pipe Corrosion Protection:	Corrosion Resistant
Pipe Pumping System:	Pressurized System
Responsible Unit:	Southwest
Dispencer/Pump SFC Type:	Not reported
Region:	Southwest
Is Active:	True
Actual Capacity:	10000
Pipe Install Date:	Not reported
Turbine Sump Construction:	Not reported
Compart Number:	2
Stored Substance:	Diesel
Used Substance:	Motor Fuel for Vehicles
Compart Capacity:	10000
URL:	https://apps.ecology.wa.gov/cleanupsearch/reports/ust?SiteId=5165
Name:	TANGLE WILD ARCO
Address:	7291 MARTIN WAY E
City:	OLYMPIA
Zip:	98516
Tank Name:	Not reported
Tag Number:	A0731
Tank Status:	Operational
Tank Status Date:	8/6/1996
Tank Install Date:	3/1/1988
Tank Closure Date:	Not reported
Capacity Range:	5,000 to 9,999 Gallons
Tank Permit Expiration Date:	11/30/2022
Tank Upgrade Date:	3/1/1988
Tank Spill Prevention:	Spill Bucket/Spill Box
Tank Overfill Prevention:	Automatic Shutoff (fill pipe)
Tank Material:	Fiberglass Reinforced Plastic
Tank Construction:	Double Wall Tank

TANGLE WILD ARCO (Continued) **U003354719**

Tank Tightness Test:	Part of Automatic Tank Gauging (ATG) System
Tank Corrosion Protection:	Corrosion Resistant
Tank Manifold:	Not reported
Tank Release Detection:	Automatic Tank Gauging
Tank SFC Type:	Not reported
Pipe Material:	Fiberglass
Pipe Construction:	Double Wall Pipe
Pipe Primary Release Detection:	Automatic Line Leak Detector (ALLD)
Pipe Second Release Detection:	Not reported
Pipe Corrosion Protection:	Corrosion Resistant
Pipe Pumping System:	Pressurized System
Responsible Unit:	Southwest
Dispencer/Pump SFC Type:	Not reported
Region:	Southwest
Is Active:	True
Actual Capacity:	10000
Pipe Install Date:	Not reported
Turbine Sump Construction:	Not reported
Compart Number:	1
Stored Substance:	Unleaded Gasoline
Used Substance:	Motor Fuel for Vehicles
Compart Capacity:	10000
URL:	https://apps.ecology.wa.gov/cleanupsearch/reports/ust?SiteId=5165

Name:	TANGLE WILD ARCO
Address:	7291 MARTIN WAY E
City:	OLYMPIA
Zip:	98516

Tank Name:	Not reported
Tag Number:	A0731
Tank Status:	Removed
Tank Status Date:	8/6/1996
Tank Install Date:	3/1/1988
Tank Closure Date:	Not reported
Capacity Range:	Not reported
Tank Permit Expiration Date:	Not reported
Tank Upgrade Date:	3/1/1988
Tank Spill Prevention:	Other
Tank Overfill Prevention:	Ball Float Valve (vent line)
Tank Material:	Fiberglass Reinforced Plastic
Tank Construction:	Double Wall Tank
Tank Tightness Test:	Annual
Tank Corrosion Protection:	Corrosion Resistant
Tank Manifold:	Not reported
Tank Release Detection:	Interstitial Monitoring
Tank SFC Type:	Not reported
Pipe Material:	Fiberglass
Pipe Construction:	Double Wall Pipe
Pipe Primary Release Detection:	Automatic Line Leak Detector (ALLD)
Pipe Second Release Detection:	Not reported
Pipe Corrosion Protection:	Corrosion Resistant
Pipe Pumping System:	Pressurized System
Responsible Unit:	Southwest
Dispencer/Pump SFC Type:	Not reported
Region:	Southwest
Is Active:	True

TANGLE WILD ARCO (Continued) **U003354719**

Actual Capacity: 1000
Pipe Install Date: Not reported
Turbine Sump Construction: Not reported
Compart Number: 1
Stored Substance: Used Oil/Waste Oil
Used Substance: Recycled (Used Oil)
Compart Capacity: 1000
URL: https://apps.ecology.wa.gov/cleanupsearch/reports/ust?SiteId=5165

ALLSITES:
Name: TANGLEWILDE CHEVRON
Facility Id: 75957582

Interaction: 63218
Interaction 1: I
Interaction 2: HWG
Ecology Program: HAZWASTE
Program Data: TURBOWASTE
Facility Alt.: Not reported
Program ID: WAD981772734
Date Interaction: 1988-04-12 00:00:00
Date Interaction 3: Hazardous Waste Generator
Latitude: 47.052813656700003
Longitude: -122.783013868

Interaction: 63222
Interaction 1: A
Interaction 2: VOLCLNST
Ecology Program: TOXICS
Program Data: ISIS
Facility Alt.: TANGLEWILDE CHEVRON
Program ID: SW0728
Date Interaction: 2006-01-12 00:00:00
Date Interaction 3: Voluntary Cleanup Sites
Latitude: 47.052813656700003
Longitude: -122.783013868

Interaction: 63223
Interaction 1: A
Interaction 2: ENFORFNL
Ecology Program: TOXICS
Program Data: DMS
Facility Alt.: Not reported
Program ID: Not reported
Date Interaction: 2008-04-28 00:00:00
Date Interaction 3: Enforcement Final
Latitude: 47.052813656700003
Longitude: -122.783013868

Interaction: 63220
Interaction 1: A
Interaction 2: UST
Ecology Program: TOXICS
Program Data: UST

TANGLE WILD ARCO (Continued) **U003354719**

Facility Alt.:	TANGLE WILD ARCO
Program ID:	5165
Date Interaction:	2000-03-20 00:00:00
Date Interaction 3:	Underground Storage Tank
Latitude:	47.052813656700003
Longitude:	-122.783013868

Interaction:	63219
Interaction 1:	I
Interaction 2:	TIER2
Ecology Program:	HAZWASTE
Program Data:	EPCRA
Facility Alt.:	Not reported
Program ID:	WAD981772734
Date Interaction:	1991-01-01 00:00:00
Date Interaction 3:	Emergency/Haz Chem Rpt TI
Latitude:	47.052813656700003
Longitude:	-122.783013868

Interaction:	63221
Interaction 1:	A
Interaction 2:	LUST
Ecology Program:	TOXICS
Program Data:	ISIS
Facility Alt.:	Not reported
Program ID:	5165
Date Interaction:	2000-10-02 00:00:00
Date Interaction 3:	LUST Facility
Latitude:	47.052813656700003
Longitude:	-122.783013868

---

17 **LACEY URBAN CENTER** **CSCSL** **S127349161**
SSW **7131 - 7239 MARTIN WAY E** **VCP** **N/A**
1/2-1 **OLYMPIA, WA 98516** **ALLSITES**
0.966 mi. **DRYCLEANERS**
5099 ft.

Relative:
Lower

Actual:
200 ft.

CSCSL:

Name:	LACEY URBAN CENTER
Address:	7131 - 7239 MARTIN WAY E
City,State,Zip:	OLYMPIA, WA 98516
Facility ID:	67913
Region:	Southwest
Lat/Long:	47.051888222 / -122.78478074
Clean Up Siteid:	15414
Site Status:	Cleanup Started
Contaminant Name:	Halogenated Solvents
Alternate Site Names:	Not reported
Site Rank:	Not reported
Has Institutional Control:	Not reported
Past VCP:	TRUE
Current VCP:	TRUE
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/15414
Ground Water:	Below Cleanup Levels
Surface Water:	Not reported

LACEY URBAN CENTER (Continued) **S127349161**

Soil: Confirmed Above Cleanup Levels
Sediment: Not reported
Air: Confirmed Above Cleanup Levels
Bedrock: Not reported
Responsible Unit: Southwest

Name: LACEY URBAN CENTER
Address: 7131 - 7239 MARTIN WAY E
City,State,Zip: OLYMPIA, WA 98516
Facility ID: 67913
Region: Southwest
Lat/Long: 47.051888222 / -122.78478074
Clean Up Siteid: 15414
Site Status: Cleanup Started
Contaminant Name: Other Halogenated Organics
Alternate Site Names: Not reported
Site Rank: Not reported
Has Institutional Control: Not reported
Past VCP: TRUE
Current VCP: TRUE
URL: https://apps.ecology.wa.gov/cleanupsearch/site/15414
Ground Water: Suspected
Surface Water: Not reported
Soil: Suspected
Sediment: Not reported
Air: Not reported
Bedrock: Not reported
Responsible Unit: Southwest

VCP:
Name: LACEY URBAN CENTER
Address: 7131 - 7239 MARTIN WAY E
City,State,Zip: OLYMPIA, WA 98516
edr_fstat: WA
edr_fzip: 98516
edr_fcnty: THURSTON
edr_zip: Not reported
Facility ID: 67913
VCP Status: Cleanup Started
Past VCP: TRUE
Current VCP: TRUE
NFA Type: OLYMPIA, WA 98516
Date NFA: OLYMPIA, WA 98516
Rank: OLYMPIA, WA 98516
Cleanup Siteid: 15414
Contaminant Name: Halogenated Solvents
Soil: Confirmed Above Cleanup Levels
URL: https://apps.ecology.wa.gov/cleanupsearch/site/15414

Name: LACEY URBAN CENTER
Address: 7131 - 7239 MARTIN WAY E
City,State,Zip: OLYMPIA, WA 98516
edr_fstat: WA
edr_fzip: 98516
edr_fcnty: THURSTON
edr_zip: Not reported
Facility ID: 67913

LACEY URBAN CENTER (Continued) **S127349161**

VCP Status: Cleanup Started
Past VCP: TRUE
Current VCP: TRUE
NFA Type: OLYMPIA, WA 98516
Date NFA: OLYMPIA, WA 98516
Rank: OLYMPIA, WA 98516
Cleanup Siteid: 15414
Contaminant Name: Other Halogenated Organics
Soil: Suspected
URL: https://apps.ecology.wa.gov/cleanupsearch/site/15414

ALLSITES:
Name: LACEY URBAN CENTER
Facility Id: 67913

Interaction: 141250
Interaction 1: A
Interaction 2: VOLCLNST
Ecology Program: TOXICS
Program Data: ISIS
Facility Alt.: Lacey Urban Center
Program ID: SW1745
Date Interaction: 2021-04-13 00:00:00
Date Interaction 3: Voluntary Cleanup Sites
Latitude: 47.0518817269
Longitude: -122.78478040100001

Interaction: 139064
Interaction 1: A
Interaction 2: SCS
Ecology Program: TOXICS
Program Data: ISIS
Facility Alt.: Lacey Urban Center
Program ID: Not reported
Date Interaction: 2021-04-01 00:00:00
Date Interaction 3: State Cleanup Site
Latitude: 47.0518817269
Longitude: -122.78478040100001

DRYCLEANERS:
Name: LACEY URBAN CENTER
Address: 7131 - 7239 MARTIN WAY E
City,State,Zip: OLYMPIA, WA 98516
EPA Id: Not reported
FS Id: 67913
Tax Reg Nbr: Not reported
Business Type: Not reported
Fed Waste Code Desc: Not reported
State Waste Code Desc: Not reported
Mail Name: Not reported
Mail Line1: Not reported
Mail Line2: Not reported
Mail City,St,Zip: Not reported
Mail Country: Not reported

LACEY URBAN CENTER (Continued) **S127349161**

Legal Org Name:	Not reported
Legal Person First Name:	Not reported
Legal Person Middle Init:	Not reported
Legal Person Last Name:	Not reported
Legal Line1:	Not reported
Legal Line2:	Not reported
Legal City,St,Zip:	Not reported
Legal Country:	Not reported
Legal Phone Nbr:	Not reported
Legal Effective Date:	Not reported
Legal Organization Type:	Not reported
Land Org Name:	Not reported
Land Person First Name:	Not reported
Land Person Middle Init:	Not reported
Land Person Last Name:	Not reported
Land Line1:	Not reported
Land Line2:	Not reported
Land City,St,Zip:	Not reported
Land Country:	Not reported
Land Phone Nbr:	Not reported
Land Organization Type:	Not reported
Operator Org Name:	Not reported
Operator Person First Name:	Not reported
Operator Person Middle Init:	Not reported
Operator Person Last Name:	Not reported
Operator Line1:	Not reported
Operator Line2:	Not reported
Operator City,St,Zip:	Not reported
Operator Country:	Not reported
Operator Phone Nbr:	Not reported
Operator Effective Date:	Not reported
Operator Organization Type:	Not reported
Site Contact First Name:	Not reported
Site Contact Middle Init:	Not reported
Site Contact Last Name:	Not reported
Site Contact Line1:	Not reported
Site Contact Line2:	Not reported
Site Contact City,St,Zip:	Not reported
Site Contact Country:	Not reported
Site Contact Phone Nbr:	Not reported
Site Contact Email:	Not reported
Form Contact First Name:	Not reported
Form Contact Middle Init:	Not reported
Form Contact Last Name:	Not reported
Form Contact Line1:	Not reported
Form Contact Line2:	Not reported
Form Contact City,St,Zip:	Not reported
Form Contact Country:	Not reported
Form Contact Phone Nbr:	Not reported
Form Contact Email:	Not reported
Gen Status Cd:	Not reported
Monthly Generation:	Not reported
Batch Generation:	Not reported
One Time Generation:	Not reported
Transports Own Waste:	Not reported
Transports Others Waste:	Not reported
Recycler Onsite:	Not reported

LACEY URBAN CENTER (Continued) **S127349161**

Transfer Facility:	Not reported
Pbr:	Not reported
Tbg:	Not reported
Mixed Radioactive:	Not reported
Importer:	Not reported
Tsdr Facility:	Not reported
Immediate Recycler:	Not reported
Gen Dang Fuel:	Not reported
Gen Market To Burner:	Not reported
Gen Other Marketers:	Not reported
Utility Boiler Burner:	Not reported
Industry Boiler Burner:	Not reported
Furnace Burner:	Not reported
Smelter Deferral:	Not reported
Small Qty Exemption:	Not reported
Other Exemption:	Not reported
UW Battery Gen:	Not reported
UW Thermostats Gen:	Not reported
UW Mercury Gen:	Not reported
UW Lamps Gen:	Not reported
UW Battery Accum:	Not reported
UW Thermostats Accum:	Not reported
UW Mercury Accum:	Not reported
UW Lamps Accum:	Not reported
UW Destination Facility:	Not reported
Off Spec Utility Boiler:	Not reported
Off Spec Industry Boiler:	Not reported
Off Spec Furnace:	Not reported
Used Oil Transporter:	Not reported
Used Oil Transfer Facility:	Not reported
Used Oil Processor:	Not reported
Used Oil Rerefiner:	Not reported
Used Oil Fuel Marketer Directs Shipments:	Not reported
Used Oil Fuel Marketer Meets Specs:	Not reported
ECO Int Type Code:	SCS
Status Code:	A
Start Date:	04/01/2021
End Date:	Not reported
NAICS DS:	Coin-Operated Laundries and Drycleaners
Program Name:	Not reported
FS SIC Code:	Not reported
SIC DS:	ISIS
Latitude:	47.051888222
Longitude:	-122.78478074
Comments:	Not reported

Name:	LACEY URBAN CENTER
Address:	7131 - 7239 MARTIN WAY E
City,State,Zip:	OLYMPIA, WA 98516
EPA Id:	Not reported
FS Id:	67913
Tax Reg Nbr:	Not reported
Business Type:	Not reported
Fed Waste Code Desc:	Not reported
State Waste Code Desc:	Not reported
Mail Name:	Not reported
Mail Line1:	Not reported

LACEY URBAN CENTER (Continued) **S127349161**

Mail Line2:	Not reported
Mail City,St,Zip:	Not reported
Mail Country:	Not reported
Legal Org Name:	Not reported
Legal Person First Name:	Not reported
Legal Person Middle Init:	Not reported
Legal Person Last Name:	Not reported
Legal Line1:	Not reported
Legal Line2:	Not reported
Legal City,St,Zip:	Not reported
Legal Country:	Not reported
Legal Phone Nbr:	Not reported
Legal Effective Date:	Not reported
Legal Organization Type:	Not reported
Land Org Name:	Not reported
Land Person First Name:	Not reported
Land Person Middle Init:	Not reported
Land Person Last Name:	Not reported
Land Line1:	Not reported
Land Line2:	Not reported
Land City,St,Zip:	Not reported
Land Country:	Not reported
Land Phone Nbr:	Not reported
Land Organization Type:	Not reported
Operator Org Name:	Not reported
Operator Person First Name:	Not reported
Operator Person Middle Init:	Not reported
Operator Person Last Name:	Not reported
Operator Line1:	Not reported
Operator Line2:	Not reported
Operator City,St,Zip:	Not reported
Operator Country:	Not reported
Operator Phone Nbr:	Not reported
Operator Effective Date:	Not reported
Operator Organization Type:	Not reported
Site Contact First Name:	Not reported
Site Contact Middle Init:	Not reported
Site Contact Last Name:	Not reported
Site Contact Line1:	Not reported
Site Contact Line2:	Not reported
Site Contact City,St,Zip:	Not reported
Site Contact Country:	Not reported
Site Contact Phone Nbr:	Not reported
Site Contact Email:	Not reported
Form Contact First Name:	Not reported
Form Contact Middle Init:	Not reported
Form Contact Last Name:	Not reported
Form Contact Line1:	Not reported
Form Contact Line2:	Not reported
Form Contact City,St,Zip:	Not reported
Form Contact Country:	Not reported
Form Contact Phone Nbr:	Not reported
Form Contact Email:	Not reported
Gen Status Cd:	Not reported
Monthly Generation:	Not reported
Batch Generation:	Not reported
One Time Generation:	Not reported

LACEY URBAN CENTER (Continued) **S127349161**

Transports Own Waste:	Not reported
Transports Others Waste:	Not reported
Recycler Onsite:	Not reported
Transfer Facility:	Not reported
Pbr:	Not reported
Tbg:	Not reported
Mixed Radioactive:	Not reported
Importer:	Not reported
Tsdr Facility:	Not reported
Immediate Recycler:	Not reported
Gen Dang Fuel:	Not reported
Gen Market To Burner:	Not reported
Gen Other Marketers:	Not reported
Utility Boiler Burner:	Not reported
Industry Boiler Burner:	Not reported
Furnace Burner:	Not reported
Smelter Deferral:	Not reported
Small Qty Exemption:	Not reported
Other Exemption:	Not reported
UW Battery Gen:	Not reported
UW Thermostats Gen:	Not reported
UW Mercury Gen:	Not reported
UW Lamps Gen:	Not reported
UW Battery Accum:	Not reported
UW Thermostats Accum:	Not reported
UW Mercury Accum:	Not reported
UW Lamps Accum:	Not reported
UW Destination Facility:	Not reported
Off Spec Utility Boiler:	Not reported
Off Spec Industry Boiler:	Not reported
Off Spec Furnace:	Not reported
Used Oil Transporter:	Not reported
Used Oil Transfer Facility:	Not reported
Used Oil Processor:	Not reported
Used Oil Rerefiner:	Not reported
Used Oil Fuel Marketer Directs Shipments:	Not reported
Used Oil Fuel Marketer Meets Specs:	Not reported
ECO Int Type Code:	VOLCLNST
Status Code:	A
Start Date:	04/13/2021
End Date:	Not reported
NAICS DS:	Coin-Operated Laundries and Drycleaners
Program Name:	Not reported
FS SIC Code:	Not reported
SIC DS:	ISIS
Latitude:	47.051888222
Longitude:	-122.78478074
Comments:	Not reported

Count: 9 records

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
AREA WIDE	S127990311	TACOMA SMELTER PLUME THURSTON COUNTY	TSP AREA WIDE THURSTON COUNTY	98516	CSCSL, ALLSITES
LACEY	S103510871	UNOCAL #6405	I-5 AND MARVIN ROAD	98503	ICR
LACEY	S124432946	LACEY GATEWAY	BRITTON PKWY GATEWAY BLVD CALLISON RD	98503	VCP
LACEY	S124436518	JENAMAR PROPERTY PARCEL 11926410100	WILLAMETTE BLVD N	98516	VCP
LACEY	S124435135	MERIDIAN CAMPUS CAMPUS WILLOWS	WILLAMETTE DR NE & CAMPUS GREEN DR NE	98503	VCP
LACEY	S124436903	MERIDIAN CAMPUS	WILLAMETTE DR NE & 31ST AVE NE	98503	VCP
LACEY	S128621727	MERIDIAN CAMPUS CAMPUS GLEN	WILLAMETTE DR NE & CAMPUS GLEN DR NE	98503	CSCSL NFA
LACEY	S128621857	MERIDIAN CAMPUS CAMPUS GLEN	WILLAMETTE DR NE & CAMPUS GLEN DR NE	98503	VCP
OLYMPIA	S124432348	HOGUM BAY LOGISTICS CENTER	31XX MARVIN RD	98516	VCP

Site	Database(s)	EDR ID Number EPA ID Number
TACOMA SMELTER PLUME THURSTON COUNTY **TSP AREA WIDE THURSTON COUNTY** **AREA WIDE, WA 98516**	**CSCSL** **ALLSITES**	**S127990311** **N/A**

CSCSL:

Name:	TACOMA SMELTER PLUME THURSTON COUNTY
Address:	TSP AREA WIDE THURSTON COUNTY
City,State,Zip:	AREA WIDE, WA 98516
Facility ID:	24971643
Region:	Southwest
Lat/Long:	47.090257458 / -122.74706322
Clean Up Siteid:	2324
Site Status:	Cleanup Started
Contaminant Name:	Arsenic
Alternate Site Names:	TACOMA SMELTER PLUME THURSTON CNTY
Site Rank:	0 - NPL Site (Fed HRS Score)
Has Institutional Control:	Not reported
Past VCP:	Not reported
Current VCP:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/2324
Ground Water:	Not reported
Surface Water:	Suspected
Soil:	Confirmed Above Cleanup Levels
Sediment:	Not reported
Air:	Not reported
Bedrock:	Not reported
Responsible Unit:	Southwest

Name:	TACOMA SMELTER PLUME THURSTON COUNTY
Address:	TSP AREA WIDE THURSTON COUNTY
City,State,Zip:	AREA WIDE, WA 98516
Facility ID:	24971643
Region:	Southwest
Lat/Long:	47.090257458 / -122.74706322
Clean Up Siteid:	2324
Site Status:	Cleanup Started
Contaminant Name:	Metals Priority Pollutants
Alternate Site Names:	TACOMA SMELTER PLUME THURSTON CNTY
Site Rank:	0 - NPL Site (Fed HRS Score)
Has Institutional Control:	Not reported
Past VCP:	Not reported
Current VCP:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/2324
Ground Water:	Not reported
Surface Water:	Suspected
Soil:	Confirmed Above Cleanup Levels
Sediment:	Not reported
Air:	Not reported
Bedrock:	Not reported
Responsible Unit:	Southwest

ALLSITES:

Name:	TACOMA SMELTER PLUME THURSTON COUNTY
Facility Id:	24971643

Interaction:	34225
Interaction 1:	A
Interaction 2:	SCS

Site	Database(s)	EDR ID Number EPA ID Number

TACOMA SMELTER PLUME THURSTON COUNTY (Continued) S127990311

Ecology Program:	TOXICS
Program Data:	ISIS
Facility Alt.:	TACOMA SMELTER PLUME THURSTON CNTY
Program ID:	Not reported
Date Interaction:	2000-06-05 00:00:00
Date Interaction 3:	State Cleanup Site
Latitude:	47.090253207099998
Longitude:	-122.747049598

UNOCAL #6405 **ICR** **S103510871**
I-5 AND MARVIN ROAD **N/A**
LACEY, WA 98503

ICR:

Date Ecology Received Report:	10/15/92
Contaminants Found at Site:	Petroleum products
Media Contaminated:	Soil
Waste Management:	Tank
Region:	South Western
Type of Report Ecology Received:	Interim cleanup report
Site Register Issue:	92-35
County Code:	34
Contact:	Not reported
Report Title:	Not reported

LACEY GATEWAY **VCP** **S124432946**
BRITTON PKWY GATEWAY BLVD CALLISON RD **N/A**
LACEY, WA 98503

VCP:

Name:	LACEY GATEWAY
Address:	BRITTON PKWY GATEWAY BLVD CALLISON RD
City,State,Zip:	LACEY, WA 98503
edr_fstat:	WA
edr_fzip:	98503
edr_fcnty:	THURSTON
edr_zip:	Not reported
Facility ID:	18563
VCP Status:	Cleanup Started
Past VCP:	TRUE
Current VCP:	TRUE
NFA Type:	LACEY, WA 98503
Date NFA:	LACEY, WA 98503
Rank:	LACEY, WA 98503
Cleanup Siteid:	11952
Contaminant Name:	Arsenic
Soil:	Confirmed Above Cleanup Levels
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/11952

Name:	LACEY GATEWAY
Address:	BRITTON PKWY GATEWAY BLVD CALLISON RD
City,State,Zip:	LACEY, WA 98503
edr_fstat:	WA
edr_fzip:	98503
edr_fcnty:	THURSTON

Site	Database(s)	EDR ID Number EPA ID Number

LACEY GATEWAY (Continued) S124432946

edr_zip: Not reported
Facility ID: 18563
VCP Status: Cleanup Started
Past VCP: TRUE
Current VCP: TRUE
NFA Type: LACEY, WA 98503
Date NFA: LACEY, WA 98503
Rank: LACEY, WA 98503
Cleanup Siteid: 11952
Contaminant Name: Lead
Soil: Confirmed Above Cleanup Levels
URL: https://apps.ecology.wa.gov/cleanupsearch/site/11952

JENAMAR PROPERTY PARCEL 11926410100 **VCP** **S124436518**
WILLAMETTE BLVD N **N/A**
LACEY, WA 98516

VCP:
Name: JENAMAR PROPERTY PARCEL 11926410100
Address: WILLAMETTE BLVD N
City,State,Zip: LACEY, WA 98516
edr_fstat: WA
edr_fzip: 98516
edr_fcnty: THURSTON
edr_zip: Not reported
Facility ID: 9159422
VCP Status: NFA
Past VCP: Not reported
Current VCP: Not reported
NFA Type: LACEY, WA 98516
Date NFA: LACEY, WA 98516
Rank: LACEY, WA 98516
Cleanup Siteid: 1777
Contaminant Name: Arsenic
Soil: Remediated-Below
URL: https://apps.ecology.wa.gov/cleanupsearch/site/1777

MERIDIAN CAMPUS CAMPUS WILLOWS **VCP** **S124435135**
WILLAMETTE DR NE & CAMPUS GREEN DR NE **N/A**
LACEY, WA 98503

VCP:
Name: MERIDIAN CAMPUS CAMPUS WILLOWS
Address: WILLAMETTE DR NE & CAMPUS GREEN DR NE
City,State,Zip: LACEY, WA 98503
edr_fstat: WA
edr_fzip: 98503
edr_fcnty: THURSTON
edr_zip: Not reported
Facility ID: 6004
VCP Status: NFA
Past VCP: Not reported
Current VCP: Not reported
NFA Type: LACEY, WA 98503
Date NFA: LACEY, WA 98503
Rank: LACEY, WA 98503

Site	Database(s)	EDR ID Number EPA ID Number

MERIDIAN CAMPUS CAMPUS WILLOWS (Continued) S124435135

Cleanup Siteid: 11810
Contaminant Name: Arsenic
Soil: Remediated-Below
URL: https://apps.ecology.wa.gov/cleanupsearch/site/11810

Name: MERIDIAN CAMPUS CAMPUS WILLOWS
Address: WILLAMETTE DR NE & CAMPUS GREEN DR NE
City,State,Zip: LACEY, WA 98503
edr_fstat: WA
edr_fzip: 98503
edr_fcnty: THURSTON
edr_zip: Not reported
Facility ID: 6004
VCP Status: NFA
Past VCP: Not reported
Current VCP: Not reported
NFA Type: LACEY, WA 98503
Date NFA: LACEY, WA 98503
Rank: LACEY, WA 98503
Cleanup Siteid: 11810
Contaminant Name: Lead
Soil: Below Cleanup Levels
URL: https://apps.ecology.wa.gov/cleanupsearch/site/11810

MERIDIAN CAMPUS **VCP** **S124436903**
WILLAMETTE DR NE & 31ST AVE NE **N/A**
LACEY, WA 98503

VCP:
Name: MERIDIAN CAMPUS
Address: WILLAMETTE DR NE & 31ST AVE NE
City,State,Zip: LACEY, WA 98503
edr_fstat: WA
edr_fzip: 98503
edr_fcnty: THURSTON
edr_zip: Not reported
Facility ID: 9945
VCP Status: Cleanup Started
Past VCP: TRUE
Current VCP: Not reported
NFA Type: LACEY, WA 98503
Date NFA: LACEY, WA 98503
Rank: LACEY, WA 98503
Cleanup Siteid: 1252
Contaminant Name: Arsenic
Soil: Confirmed Above Cleanup Levels
URL: https://apps.ecology.wa.gov/cleanupsearch/site/1252

Name: MERIDIAN CAMPUS
Address: WILLAMETTE DR NE & 31ST AVE NE
City,State,Zip: LACEY, WA 98503
edr_fstat: WA
edr_fzip: 98503
edr_fcnty: THURSTON
edr_zip: Not reported
Facility ID: 9945
VCP Status: Cleanup Started

Site	Database(s)	EDR ID Number EPA ID Number

MERIDIAN CAMPUS (Continued) S124436903

Past VCP:	TRUE
Current VCP:	Not reported
NFA Type:	LACEY, WA 98503
Date NFA:	LACEY, WA 98503
Rank:	LACEY, WA 98503
Cleanup Siteid:	1252
Contaminant Name:	Metals - Other
Soil:	Confirmed Above Cleanup Levels
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/1252
Name:	MERIDIAN CAMPUS
Address:	WILLAMETTE DR NE & 31ST AVE NE
City,State,Zip:	LACEY, WA 98503
edr_fstat:	WA
edr_fzip:	98503
edr_fcnty:	THURSTON
edr_zip:	Not reported
Facility ID:	9945
VCP Status:	Cleanup Started
Past VCP:	TRUE
Current VCP:	Not reported
NFA Type:	LACEY, WA 98503
Date NFA:	LACEY, WA 98503
Rank:	LACEY, WA 98503
Cleanup Siteid:	1252
Contaminant Name:	Metals Priority Pollutants
Soil:	Confirmed Above Cleanup Levels
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/1252

MERIDIAN CAMPUS CAMPUS GLEN **CSCSL NFA** **S128621727**
WILLAMETTE DR NE & CAMPUS GLEN DR NE **N/A**
LACEY, WA 98503

CSCSL NFA:

Name:	MERIDIAN CAMPUS CAMPUS GLEN
Address:	WILLAMETTE DR NE & CAMPUS GLEN DR NE
City,State,Zip:	LACEY, WA 98503
Facility/Site Id:	4986926
CS Id:	1547
NFA Date:	12/30/2005
Alternate Site Names:	CAMPUS GLEN
NFA Reason:	Voluntary Cleanup Program Review
Site Status:	NFA
Region:	Southwest
Contaminant Name:	Arsenic
Ground Water:	Not reported
Surface Water:	Not reported
Soil:	Remediated-Below
Sediment:	Not reported
Air:	Not reported
Bedrock:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/1547
Latitude:	47.083
Longitude:	-122.758
Name:	MERIDIAN CAMPUS CAMPUS GLEN
Address:	WILLAMETTE DR NE & CAMPUS GLEN DR NE

Site	Database(s)	EDR ID Number EPA ID Number

MERIDIAN CAMPUS CAMPUS GLEN (Continued) S128621727

City,State,Zip:	LACEY, WA 98503
Facility/Site Id:	4986926
CS Id:	1547
NFA Date:	12/30/2005
Alternate Site Names:	CAMPUS GLEN
NFA Reason:	Voluntary Cleanup Program Review
Site Status:	NFA
Region:	Southwest
Contaminant Name:	Lead
Ground Water:	Not reported
Surface Water:	Not reported
Soil:	Below Cleanup Levels
Sediment:	Not reported
Air:	Not reported
Bedrock:	Not reported
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/1547
Latitude:	47.083
Longitude:	-122.758

MERIDIAN CAMPUS CAMPUS GLEN **VCP** **S128621857**
WILLAMETTE DR NE & CAMPUS GLEN DR NE **N/A**
LACEY, WA 98503

VCP:

Name:	MERIDIAN CAMPUS CAMPUS GLEN
Address:	WILLAMETTE DR NE & CAMPUS GLEN DR NE
City,State,Zip:	LACEY, WA 98503
edr_fstat:	WA
edr_fzip:	98503
edr_fcnty:	THURSTON
edr_zip:	Not reported
Facility ID:	4986926
VCP Status:	NFA
Past VCP:	Not reported
Current VCP:	Not reported
NFA Type:	LACEY, WA 98503
Date NFA:	LACEY, WA 98503
Rank:	LACEY, WA 98503
Cleanup Siteid:	1547
Contaminant Name:	Arsenic
Soil:	Remediated-Below
URL:	https://apps.ecology.wa.gov/cleanupsearch/site/1547

Name:	MERIDIAN CAMPUS CAMPUS GLEN
Address:	WILLAMETTE DR NE & CAMPUS GLEN DR NE
City,State,Zip:	LACEY, WA 98503
edr_fstat:	WA
edr_fzip:	98503
edr_fcnty:	THURSTON
edr_zip:	Not reported
Facility ID:	4986926
VCP Status:	NFA
Past VCP:	Not reported
Current VCP:	Not reported
NFA Type:	LACEY, WA 98503
Date NFA:	LACEY, WA 98503
Rank:	LACEY, WA 98503

Site	Database(s)	EDR ID Number EPA ID Number

MERIDIAN CAMPUS CAMPUS GLEN (Continued) S128621857

Cleanup Siteid: 1547
Contaminant Name: Lead
Soil: Below Cleanup Levels
URL: https://apps.ecology.wa.gov/cleanupsearch/site/1547

HOGUM BAY LOGISTICS CENTER **VCP** **S124432348**
31XX MARVIN RD **N/A**
OLYMPIA, WA 98516

VCP:
Name: HOGUM BAY LOGISTICS CENTER
Address: 31XX MARVIN RD
City,State,Zip: OLYMPIA, WA 98516
edr_fstat: WA
edr_fzip: 98516
edr_fcnty: THURSTON
edr_zip: Not reported
Facility ID: 11146
VCP Status: NFA
Past VCP: Not reported
Current VCP: Not reported
NFA Type: OLYMPIA, WA 98516
Date NFA: OLYMPIA, WA 98516
Rank: OLYMPIA, WA 98516
Cleanup Siteid: 13222
Contaminant Name: Arsenic
Soil: Below Cleanup Levels
URL: https://apps.ecology.wa.gov/cleanupsearch/site/13222

Name: HOGUM BAY LOGISTICS CENTER
Address: 31XX MARVIN RD
City,State,Zip: OLYMPIA, WA 98516
edr_fstat: WA
edr_fzip: 98516
edr_fcnty: THURSTON
edr_zip: Not reported
Facility ID: 11146
VCP Status: NFA
Past VCP: Not reported
Current VCP: Not reported
NFA Type: OLYMPIA, WA 98516
Date NFA: OLYMPIA, WA 98516
Rank: OLYMPIA, WA 98516
Cleanup Siteid: 13222
Contaminant Name: Lead
Soil: Below Cleanup Levels
URL: https://apps.ecology.wa.gov/cleanupsearch/site/13222