Groundwater Application Review Summary Form

Application # LL-1685

GW Reviewer DENNIS ORLOWSKI **Date Review Completed:** 5/10/2017

Summary of GW Availability and Injury Review:

[ ] Groundwater for the proposed use is either over appropriated, will not likely be available in the amounts requested without injury to prior water rights, OR will not likely be available within the capacity of the groundwater resource per Section B of the attached review form.

Summary of Potential for Substantial Interference Review:

[ ] There is the potential for substantial interference per Section C of the attached review form.

Summary of Well Construction Assessment:

[ ] The well does not appear to meet current well construction standards per Section D of the attached review form. Route through Well Construction and Compliance Section.

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations and for conditions that may be necessary for a permit (if one is issued).

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 05/10/2017
FROM: Groundwater Section Dennis Orlowski
Reviewer's Name
SUBJECT: Application LL- 1685 Supersedes review of
Date of Review(s)

PUBLIC INTEREST PRESUMPTION; GROUNDWATER

OAR 690-310-130 (1) *The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525.* Department staff review groundwater applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. **This review is based upon available information and agency policies in place at the time of evaluation.**

A. GENERAL INFORMATION: Applicant's Name: **Willamette Valley Land, LLC** County: **Polk**

A1. Applicant(s) seek(s) 0.014 cfs from one well(s) in the Willamette Basin, S Yamhill River subbasin

A2. Proposed use Irrigation (drip) of 71.8 acres Seasonality: Mar 1 – Oct 31 (2017 through 2022)

A3. Well and aquifer data (**attach and number logs for existing wells; mark proposed wells as such under logid**):

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	POLK 1286*	1	Alluvium	0.014	T6S/R5W-8 SE-SE	820'N, 875'E fr SE cor DLC 39

* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1	185		~5**	5/24/2016**	29	18	0-29		21-29	10**	13**	Pump

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU is located in the South Yamhill River basin near unincorporated Ballston, Oregon, which is about 4 miles southeast of the City of Sheridan.

***NOTE**: the applicant provided the POLK 1286 well log for the proposed POA, an existing well. The POLK 1286 log has location accuracy only to the section level (Section 8), together with reference to an 'Andrew Davidson' DLC parcel. However, the OWRD database has POLK 1286 located about 4200 feet northeast of the applicant's well location (although this location places the well in Section 9, contrary to the well log information).

In the OWRD database POLK 1286 also corresponds to USGS NWIS observation well 450411123182801; it is understood that OWRD imported USGS location information for that well, but the location has not been field verified by OWRD. Apparently this well never became an active USGS observation well (USGS website shows only a single 1963 measurement obtained from the POLK 1286 log), and thus presumably its location was also not field verified by the USGS. Additional information provided by the applicant (property records, 2016 well test data and description) suggests POLK 1286 is indeed located where indicated on the application map, and not as currently shown by OWRD/USGS.

****NOTE**: well performance information shown here is summarized from well test conducted on 5/24/2016 (see attached).

A5. ☒ **Provisions of the** Willamette Basin rules relative to the development, classification and/or management of groundwater hydraulically connected to surface water ☐ **are**, *or* ☒ **are not**, activated by this application. (Not all basin rules contain such provisions.)
Comments: The proposed POA will produce groundwater from a confined aquifer and therefore the pertinent Willamette Basin rules (OAR 690-502-0240) do not apply.

A6. ☐ **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: _____
Comments: _____

B. GROUNDWATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. **Based upon available data**, I have determined that groundwater* for the proposed use:

a. ☐ **is** over appropriated, ☐ **is not** over appropriated, *or* ☒ **cannot be determined to be** over appropriated during any period of the proposed use. * This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;

b. ☐ **will not** *or* ☐ **will** likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;

c. ☐ **will not** *or* ☐ **will** likely to be available within the capacity of the groundwater resource; or

d. ☒ **will, if properly conditioned**, avoid injury to existing groundwater rights or to the groundwater resource:
   i. ☒ The permit should contain condition #(s) **7N (annual measurement condition) and medium water-use reporting**;
   ii. ☐ The permit should be conditioned as indicated in item 2 below.
   iii. ☐ The permit should contain special condition(s) as indicated in item 3 below;

B2. a. ☐ **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;

b. ☐ **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;

c. ☐ **Condition** to allow groundwater production only from the _____ groundwater reservoir between approximately_____ ft. and_____ ft. below land surface;

d. ☐ **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): _____

_____

B3. **Groundwater availability remarks:** Groundwater development is particularly limited in the South Yamhill River valley. Alluvial aquifer deposits in the area are relatively thin and thus not very prolific, with correspondingly-low well yields typically ranging from 5 to perhaps 40 gpm (OWRD Well Log Query Report). Eocene marine sedimentary rocks underlying the alluvial deposits also provide limited quantities of groundwater, and typically of poor quality (high salinity) (Woodward and others, 1998). Consequently, local streams and reservoirs provide most of the water for irrigation in the area.

There are no reported groundwater rights within 1 mile of the proposed POA, and only several within about 4-5 miles. It is possible there are some exempt (domestic) wells within a mile of the POA, particularly in unincorporated Ballston about ½ mile to the north where there appear to be about 60-70 residences. However, Ballston is within the service area of the Perrydale Domestic Water Association, so it is likely that many, if not all, of residents there obtain water from the Association. Regardless, the low requested allocation for this limited license application would not be expected to injure any existing exempt well users in the area.

Though not prolific, the local alluvial aquifer should be able to support the proposed use. If a limited license is granted, the following conditions are recommended to protect the limited groundwater resource in this area:

- 7N: annual measurement condition
- Medium water-use reporting

C. GROUNDWATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**Alluvium**	☒	☐

Basis for aquifer confinement evaluation: Well logs in this area, including that for the proposed POA (POLK 1286), indicate the presence of a water-bearing sand and gravel unit typically present from about 25-35 feet deep. This sand and gravel unit is part of the Willamette Aquifer, which the USGS estimates can be up to 20 ft thick in this area (Gannett and Caldwell, 1998). The sand and gravel units are overlain by silts and clays extending upward to near ground surface; these low permeability sediments (Willamette Silt) act as a confining unit for the underlying sand and gravel aquifer.

A recent (2016) measurement in the proposed POA, POLK 1286, shows a static groundwater level approximately 15 ft above the water-bearing unit in that well, which also indicates confined conditions.

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**Unnamed tributary to S. Yamhill River**	**180**	**160-175**	**3700**	☒	☐	☐	☐	☒
1	**2**	**Salt Creek**	**180**	**165-200**	**6500**	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation:

SW1: the estimated groundwater elevation at Well 1 and the range of elevations for SW1 are near enough to assume some degree of hydraulic connection.

SW2: the groundwater elevation at Well 1 falls squarely in the range of elevations estimated for the nearest perennial reach of Salt Creek, thus the two are hydraulically connected.

Furthermore, regional water table maps indicate that groundwater in the alluvial aquifer system flows towards and discharges into local streams incised in the alluvial deposits (Conlon and others, 2005; Gannett and Caldwell, 1998). These facts indicate that the alluvial aquifer and local streams are hydraulically connected.

Water Availability Basin the well(s) are located within:

SW1: S Yamhill River > Yamhill River – ab Cozine Creek
SW2: Salt Creek > S Yamhill River – at mouth

C3a. **690-09-040 (4):** Evaluation of stream impacts for each well that has been determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% *natural* flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked ☒ box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
1	**1**	☐	☐			☐	**40.30**	☐	**<<25%**	☐

C3b. **690-09-040 (4):** Evaluation of stream impacts by total appropriation for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells**. Otherwise same evaluation and limitations apply as in C3a above.

	SW #		Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			☐			☐		☐		☐

Comments:
C3a: Potential depletion of SW1 (unnamed tributary to the South Yamhill River) was estimated using the Hunt 2003 analytical stream depletion model (Hunt, 2003). Aquifer parameters used for the model are typical of those reported for this hydrogeologic regime (Conlon and others, 2003, 2005; Iverson, 2002; Woodward and others, 1998).

The Hunt 2003 analytical modeling results indicate that depletion of SW1 is expected to be substantially less than 25% (of well discharge) after 30 days of continuous pumping.

C3b: not applicable

C4a. **690-09-040 (5):** Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells

Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	**2**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**
Well Q as CFS				**0.014**	**0.014**	**0.014**	**0.014**	**0.014**	**0.014**	**0.014**	**0.014**		
Interference CFS		**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

Distributed Wells

Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
(A) = Total Interf.		**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
(B) = 80 % Nat. Q		**154.00**	**168.00**	**143.00**	**75.10**	**43.90**	**27.30**	**18.30**	**12.90**	**9.76**	**10.00**	**22.40**	**107.00**
(C) = 1 % Nat. Q		**1.54**	**1.68**	**1.43**	**0.751**	**0.439**	**0.273**	**0.183**	**0.129**	**0.0976**	**0.100**	**0.224**	**1.07**
(D) = (A) > (C)													
(E) = (A / B) x 100		**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

Basis for impact evaluation:

C4a: Potential depletion of SW2 (Salt Creek) was estimated using the Hunt 2003 analytical stream depletion model (Hunt, 2003). Aquifer parameters used for the model are typical of those reported for this hydrogeologic regime (Conlon and others, 2003, 2005; Iverson, 2002; Woodward and others, 1998).

The Hunt 2003 analytical modeling results indicate that depletion of SW2 is expected to be nearly inconsequential one year after pumping of proposed Well 1 begins.

C4b. **690-09-040 (5) (b) The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.**

C5. ☐ **If properly conditioned**, the surface water source(s) can be adequately protected from interference, and/or groundwater use under this permit can be regulated if it is found to substantially interfere with surface water:

i. ☐ The permit should contain condition #(s)_____;

ii. ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:**

C1 (690-09-040 (1))
The proposed POA, existing well POLK 1286, produces groundwater from a confined alluvial aquifer.

C2 (690-09-040 (2) (3))
It is determined that proposed Well 1 will be hydraulically connected to both SW 1 (unnamed tributary to the South Yamhill River) and SW2 (Salt Creek).

C3a, C3b (690-09-040 (4))
C3a: The Hunt 2003 analytical modeling results indicate that depletion of SW1 is expected to be substantially less than 25% (of well discharge) after 30 days of continuous pumping.

C3b: not applicable.

C4a (690-09-040 (5))
Potential stream of SW2 is expected to be nearly inconsequential one year after pumping of proposed Well 1 begins.

References Used:

Application file: LL-1685

Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005, Ground-water hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

Conlon, T.D., Lee, K.K., and Risley, J.R., 2003, Heat tracing in streams in the central Willamette Basin, Oregon, *in* Stonestrom, D.A., and Constantz, Jim, eds., Heat as a tool for studying the movement of groundwater near streams: U.S. Geological Survey Circular 1260, chapter 5, p. 29-34.

Garnett, M.W. and Caldwell, R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A, 32 p.

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

Iverson, J., 2002, Investigation of the hydraulic, physical, and chemical buffering capacity of Missoula flood deposits for water quality and supply in the Willamette Valley of Oregon: Unpublished M.S. thesis, Oregon State University, 147 p.

Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82 p.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** _____ **Logid:** _____

D2. **THE WELL does not appear to meet current well construction standards based upon:**

a. ☐ review of the well log;
b. ☐ field inspection by _____;
c. ☐ report of CWRE _____;
d. ☐ other: (specify) _____
_____

D3. **THE WELL construction deficiency or other comment is described as follows:** _____
_____
_____
_____
_____

D4. ☐ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Water Availability Tables

Oregon Water Resources Department
Water Availability Analysis

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Water Availability Analysis
Detailed Reports

S YAMHILL R > YAMHILL R - AB COZINE CR
WILLAMETTE BASIN
Water Availability as of 4/7/2017

Watershed ID # 162 (Map)
Date: 4/7/2017

Exceedance Level 80%
Time: 11:36 AM

Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations | Water Rights | Watershed Characteristics

Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	1,290.00	29.80	1,260.00	0.00	15.00	1,250.00
FEB	1,470.00	28.00	1,440.00	0.00	15.00	1,430.00
MAR	1,260.00	20.00	1,240.00	0.00	15.00	1,230.00
APR	764.00	14.90	749.00	0.00	15.00	734.00
MAY	378.00	23.90	354.00	0.00	15.00	339.00
JUN	171.00	44.20	127.00	0.00	15.00	112.00
JUL	79.00	66.70	12.30	0.00	15.00	-2.85
AUG	47.70	55.70	-8.05	0.00	15.00	-23.00
SEP	40.30	34.20	6.19	0.00	15.00	-8.90
OCT	53.80	9.37	44.40	0.00	15.00	29.40
NOV	363.00	14.90	348.00	0.00	15.00	333.00
DEC	1,220.00	28.10	1,190.00	0.00	15.00	1,180.00
ANN	847,000.00	22,400.00	825,000.00	0.00	10,900.00	815,000.00

Oregon Water Resources Department
Water Availability Analysis

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Water Availability Analysis
Detailed Reports

SALT CR > S YAMHILL R - AT MOUTH
WILLAMETTE BASIN
Water Availability as of 4/7/2017

Watershed ID # 73562 (Map)
Date: 4/7/2017

Exceedance Level 80%
Time: 11:40 AM

Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations | Water Rights | Watershed Characteristics

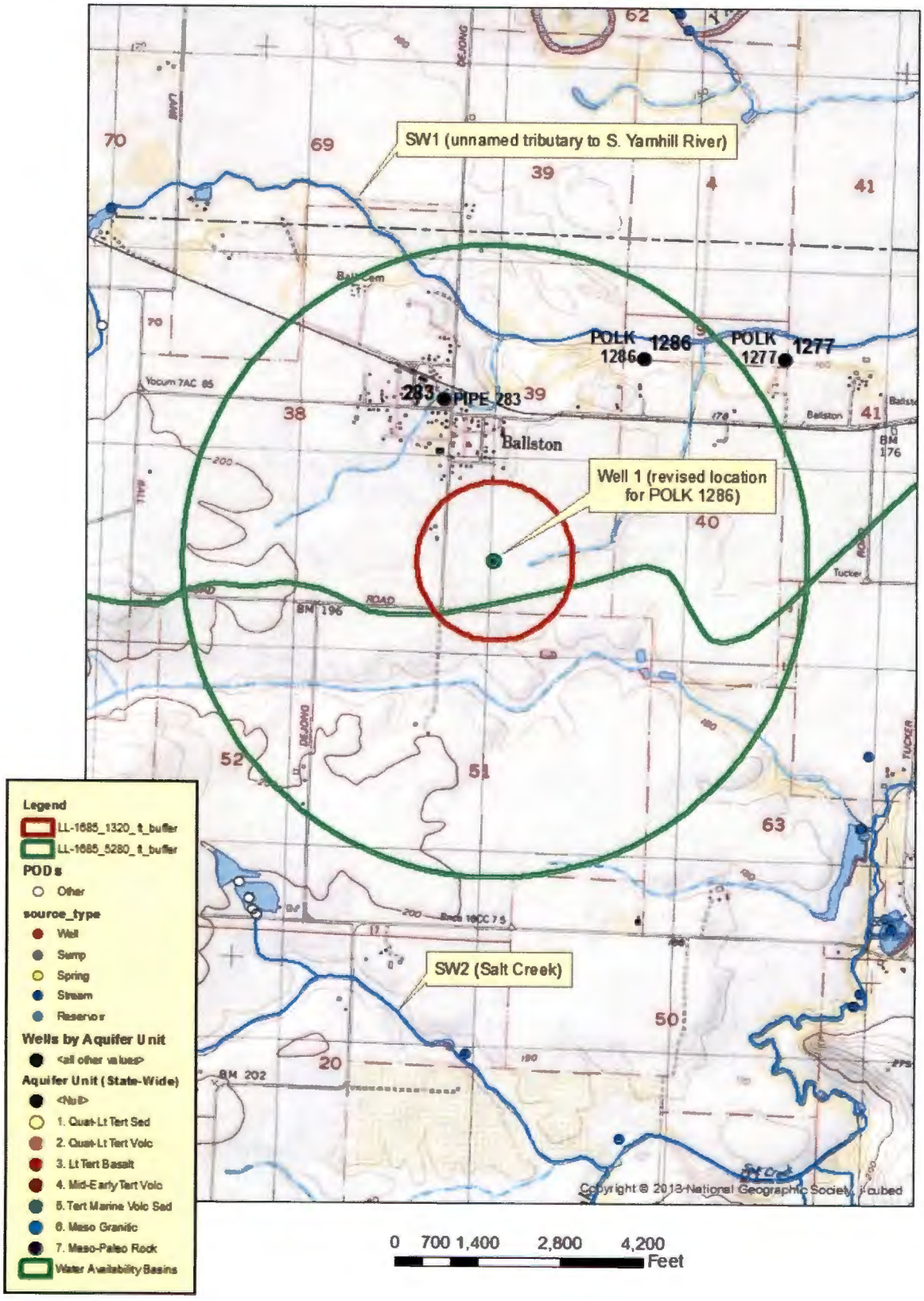
Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

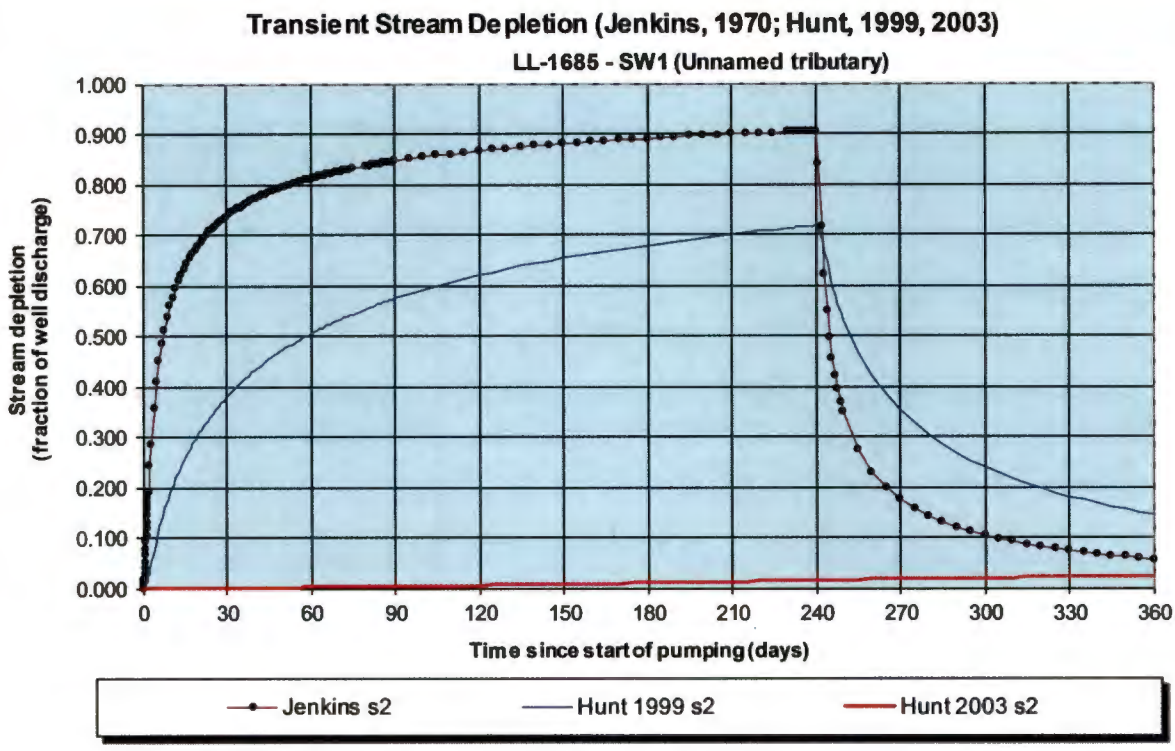
Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	154.00	17.70	137.00	0.00	0.40	136.00
FEB	168.00	15.30	153.00	0.00	0.40	152.00
MAR	143.00	12.80	130.00	0.00	0.40	130.00
APR	75.18	5.21	69.90	0.00	0.40	69.50
MAY	43.90	6.13	37.80	0.00	0.40	37.40
JUN	27.30	14.50	12.90	0.00	0.40	12.50
JUL	18.30	17.80	0.53	0.00	0.40	0.13
AUG	12.90	14.20	-1.29	0.00	0.40	-1.69
SEP	9.76	7.14	2.62	0.00	0.40	2.22
OCT	10.00	1.18	8.84	0.00	0.40	8.44
NOV	22.40	4.15	18.30	0.00	0.40	17.90
DEC	107.00	16.30	90.70	0.00	0.40	90.30
ANN	92,900.00	7,990.00	85,000.00	0.00	290.00	84,700.00

Well Location Map

LL-1685 Willamette Valley Land, LLC



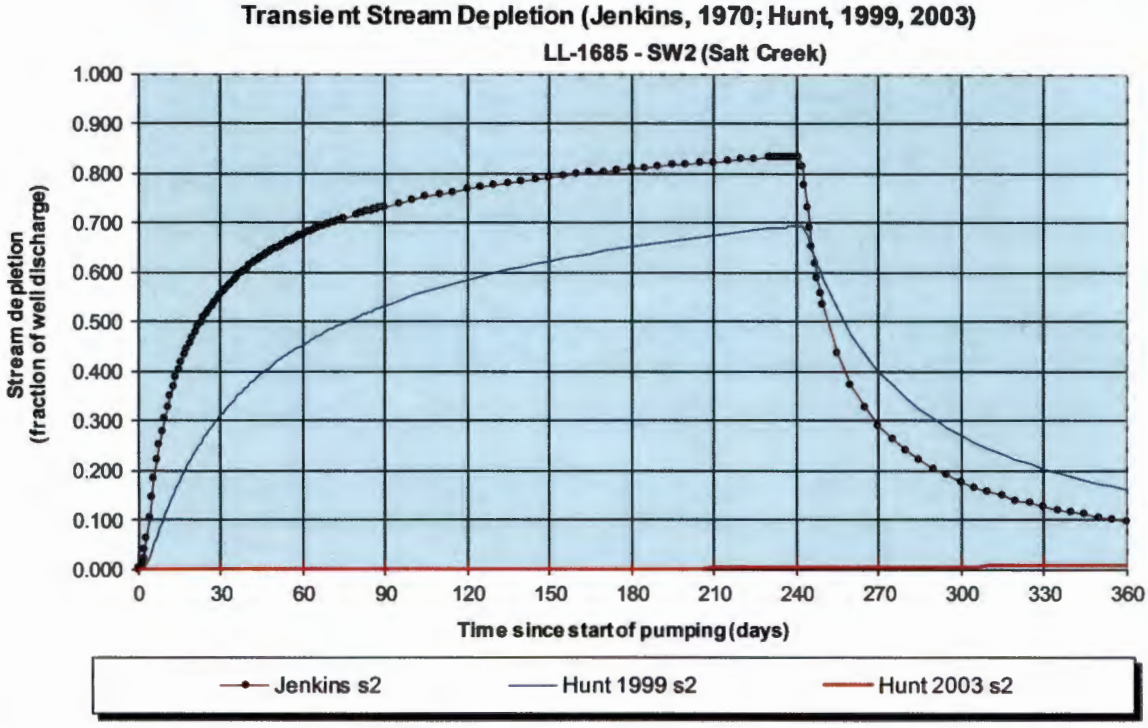
Stream Depletion Model Results (SW1)



Output for Stream Depletion, Scenerio 2 (s2):						Time pump on (pumping duration) = 240 days						
Days	30	60	90	120	150	180	210	240	270	300	330	360
J SD	73.6%	81.1%	84.5%	86.6%	88.0%	89.0%	89.8%	90.5%	17.5%	10.4%	7.3%	5.6%
H SD 1999	37.9%	50.5%	57.4%	62.0%	65.3%	67.9%	70.0%	71.7%	35.2%	23.9%	18.1%	14.4%
H SD 2003	0.09%	0.20%	0.35%	0.54%	0.75%	1.00%	1.27%	1.56%	1.78%	2.00%	2.19%	2.36%
Qw, cfs	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
H SD 99, cfs	0.005	0.007	0.008	0.009	0.009	0.010	0.010	0.010	0.005	0.003	0.003	0.002
H SD 03, cfs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	0.01	0.01	0.01	cfs
Time pump on (pumping duration)	tpon	240	240	240	days
Perpendicular from well to stream	a	3700	3700	3700	ft
Well depth	d	29	29	29	ft
Aquifer hydraulic conductivity	K	50	100	150	ft/day
Aquifer saturated thickness	b	20	20	20	ft
Aquifer transmissivity	T	1000	2000	3000	ft*ft/day
Aquifer storativity or specific yield	S	0.001	0.001	0.001	
Aquitard vertical hydraulic conductivity	Kva	0.1	0.1	0.1	ft/day
Aquitard saturated thickness	ba	20	20	20	ft
Aquitard thickness below stream	babs	3	3	3	ft
Aquitard porosity	n	0.2	0.2	0.2	
Stream width	ws	15	15	15	ft
Streambed conductance (lambda)	sbc	0.500000	0.500000	0.500000	ft/day
Stream depletion factor	sdf	13.690000	6.845000	4.563333	days
Streambed factor	sbf	1.850000	0.925000	0.616667	
input #1 for Hunt's Q_4 function	t'	0.073046	0.146092	0.219138	
input #2 for Hunt's Q_4 function	K'	68.450000	34.225000	22.816667	
input #3 for Hunt's Q_4 function	epsilon'	0.005000	0.005000	0.005000	
input #4 for Hunt's Q_4 function	lamda'	1.850000	0.925000	0.616667	

Stream Depletion Model Results (SW2)



Output for Stream Depletion, Scenerio 2 (s2):						Time pump on (pumping duration) = 240 days						
Days	30	60	90	120	150	180	210	240	270	300	330	360
J SD	55.3%	67.5%	73.2%	76.7%	79.1%	80.9%	82.3%	83.4%	29.0%	17.6%	12.6%	9.7%
H SD 1999	31.0%	45.2%	53.2%	58.4%	62.2%	65.1%	67.4%	69.3%	39.9%	27.0%	20.3%	16.1%
H SD 2003	0.00%	0.01%	0.02%	0.04%	0.08%	0.13%	0.20%	0.29%	0.40%	0.53%	0.67%	0.82%
Qw, cfs	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
H SD 99, cfs	0.004	0.006	0.007	0.008	0.009	0.009	0.009	0.010	0.006	0.004	0.003	0.002
H SD 03, cfs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	0.01	0.01	0.01	cfs
Time pump on (pumping duration)	tpon	240	240	240	days
Perpendicular from well to stream	a	6500	6500	6500	ft
Well depth	d	29	29	29	ft
Aquifer hydraulic conductivity	K	50	100	150	ft/day
Aquifer saturated thickness	b	20	20	20	ft
Aquifer transmissivity	T	1000	2000	3000	ft*ft/day
Aquifer storativity or specific yield	S	0.001	0.001	0.001	
Aquitard vertical hydraulic conductivity	Kva	0.1	0.1	0.1	ft/day
Aquitard saturated thickness	ba	20	20	20	ft
Aquitard thickness below stream	babs	3	3	3	ft
Aquitard porosity	n	0.2	0.2	0.2	
Stream width	ws	20	20	20	ft
Streambed conductance (lambda)	sbc	0.666667	0.666667	0.666667	ft/day
Stream depletion factor	sdf	42.250000	21.125000	14.083333	days
Streambed factor	sbf	4.333333	2.166667	1.444444	
input #1 for Hunt's Q_4 function	t'	0.023669	0.047337	0.071006	
input #2 for Hunt's Q_4 function	K'	211.250000	105.625000	70.416667	
input #3 for Hunt's Q_4 function	epsilon'	0.005000	0.005000	0.005000	
input #4 for Hunt's Q_4 function	lamda'	4.333333	2.166667	1.444444	

Proposed POA Well Log (POLK 1286)

RECEIVED
JUL 10 1963
STATE ENGINEER
SALEM, OREGON

POLK
1286

File Original and First Copy with the STATE ENGINEER, SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON

State Well No. 6/5W-8

State Permit No.

(1) OWNER:
Name Clyde Smith
Address Rt 1
Amity, Oregon

(2) LOCATION OF WELL:
County Polk Owner's number, if any—
¼ ¼ Section T. 6S R. 5W W.M.
Bearing and distance from section or subdivision corner
Located at the Andrew Davidson Land Claim

(3) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 11.

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

(5) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☒

(6) CASING INSTALLED: Threaded ☐ Welded ☒
6" Diam. from 0 ft. to 29 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(7) PERFORATIONS: Perforated? ☒ Yes ☐ No
Type of perforator used Torch
SIZE of perforations 1/8 in. by 12 in.
21 perforations from 21 ft. to 29 ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(8) SCREENS: Well screen installed ☐ Yes ☒ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(9) CONSTRUCTION:
Was well gravel packed? ☒ Yes ☐ No Size of gravel: 3/8 Pea
Gravel placed from 18 ft. to 29 ft.
Was a surface seal provided? ☒ Yes ☐ No To what depth? 18 ft.
Material used in seal— Cement
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

(10) WATER LEVELS:
Static level 3 ft. below land surface Date 6/25/63
Artesian pressure lbs. per square inch Date

Log Accepted by:
[Signed] Clyde Smith (Owner) Date 6/25 1963

(11) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☐ No If yes, by whom? Myself
Yield: 15 gal./min. with 20 ft. drawdown after 4 hrs.
" " " "
" " " "
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

(12) WELL LOG: Diameter of well 6 inches.
Depth drilled 29 ft. Depth of completed well 30 ft.
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
Top Soil	0	2
Yellow Clay	2	14
Blue Clay	14	24
Coarse Gravel	24	29

Work started 6/21/63 19 Completed 6/25/63 19

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

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 Ted Schueler Well Drilling (Person, firm, or corporation) (Type or print)
Address Rt 3 Box 283 Dundee, Oregon
Driller's well number
[Signed] Ted Schueler (Well Driller)
License No. 184 Date June 25, 1963

(USE ADDITIONAL SHEETS IF NECESSARY)

Recent Well Test of Proposed POA (POLK 1286)

Stettler Supply Company
"Committed to Service Excellence" Since 1948
Pumps & Pump Stations | Agricultural Irrigation | Water Treatment | Water Systems
4420 Ridge Drive NE, Salem OR 97301
503-585-5550 local 800-585-5550 toll-free 503-581-6799 fax
CCB #32238

WELL TEST DATA SHEET

OWNER'S NAME ___ *Creekside Valley Farms* WELL LOCATION/ID *Dejong Rd*

WELL DIAM ___ 6" ___ STATIC LEVEL ___ 8'6" ___ TEST PUMP SETTING ___ 20' ___

SOUNDER TUBE ___ *no top of well* ___ TEST STARTED ___ *11:48 AM* ___ TEST STOPPED ___ 12:52 ___

WELL DEPTH ___ 24" ___ TESTED BY ___ *Bob Hudson* ___ DATE ___ 5/24/2016 ___

TIME OF DAY	PUMPING LEVEL	FLOW METER READING	GPM	NOTES
11:48	8'6"	59716		
11:50				start
11:52	21'1"	59801		
11:54	20'	59849		install guage
11:59	21'3"	59904		
12.01	21'1"	59932		
12:03	21'3"	59955		16 psi
12.05	21'3"	59977	11	12.9 bucket
12.09	21'3"	60020	10.7	11.3
12:13	21'3"	60061	10.25	10.9
12.16	21'2"	60092	9.6	11
12.21	21'2"	60142	10	10.3
12.27	21'2"	60202	10	10.3
12.32	21'1"	60251	9.8	10
12:37	21'2"	60299	9.6	9.9
12:42	21'2"	60347	9.6	10.1
12.47	21'2"	60395	9.6	9.7
12.52	21'2"	60442	9.4	9.8


Bejong Rd
Well location
HUNT
A & R SCHARF LLC & SCHARF JOHN E
CALDWELL ROBERT M REVOCBL LIVING TR ET AL
CLARK BRET RYAN & JANE MICHELLE
BOYER TYLER J & DUNLAP LAURA
YUTY SOLO
A & R SCHARF LLC
KANNING DANIEL G TRST