



**PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS**

TO: Water Rights Section Date October 20, 2015  
 FROM: Groundwater Section Michael J. Thoma  
 SUBJECT: Application G- 18136 Reviewer's Name  
 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: Linda Sims / Vollstedt Farms County: Benton

A1. Applicant(s) seek(s) 0.61 cfs from 1 well(s) in the Willamette Basin,  
 \_\_\_\_\_ subbasin

A2. Proposed use Irrigation (48.62 ac Primary) Seasonality: April 1 – October 31 (213 d)

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	BENT 1614 <sup>a</sup>	1	Alluvium	0.61	10S/04W-25 SESE	580 ft N, 860 ft W of SW cor S30
2						

\* 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	190	25	20.5	10/16/75	50	0-20	+1-38		27-38	350	13	pump

Use data from application for proposed wells.

A4. **Comments:** <sup>a</sup>The well listed on the application is registered to an adjacent Township-Range-Section than the well location provided on the application map. However, OWRD staff has confirmed with the applicant that BENT 1614 is the correct well.

A5.  **Provisions of the** Willamette (OAR 690-502-0010) 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 is located > 1/4 mile from surface water so provisions 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) 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:** The proposed POA (BENT 1614) is a shallow well completed within the shallow alluvial sediments of the Willamette Valley floodplain. This alluvial aquifer is strongly hydraulically connected to the Willamette River and maintains stable water levels coincident with river stage (see attached hydrograph). The aquifer is generally unconfined and is very productive so there is little concern of well-to-well interference in this area.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**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	Floodplain Alluvium	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer confinement evaluation:** Reported SWL in similar to “First Water” identified on drillers log for BENT 1614 and other wells in the area of similar depth show similar relationships between First Water and SWL.  
 \_\_\_\_\_

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?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Main stem of Willamette River	165	165	2780	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer hydraulic connection evaluation:** SWL is coincident with surface water elevation and the aquifer is unconfined.

**Water Availability Basin the well(s) are located within:** Willamette R > Columbia R – AB Mill Cr At Gage 14191000 (Watershed ID# 183)

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	<input type="checkbox"/>	<input type="checkbox"/>	MF183A	1300	<input type="checkbox"/>	3620	<input type="checkbox"/>	~11%	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

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.

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?
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

**Comments:** An analytical model (Hunt, 1999) was used to estimate interference with surface water using parameter estimates from Herrera et al., (2014). Results (see attachment) confirm conceptual understanding of behavior in an unconfined alluvial aquifer system with high transmissivity.

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.

<b>Non-Distributed Wells</b>													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
<b>Distributed Wells</b>													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
<b>(A) = Total Interf.</b>													
<b>(B) = 80 % Nat. Q</b>													
<b>(C) = 1 % Nat. Q</b>													
<b>(D) = (A) &gt; (C)</b>													
<b>(E) = (A / B) x 100</b>		%	%	%	%	%	%	%	%	%	%	%	%

(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:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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:** Although the proposed aquifer is strongly hydraulically connected to the Willamette River, the size of the river and nature of the aquifer suggest that there will not be significant interference with surface water per OAR 690-009.

**References Used:** \_\_\_\_\_  
 Hunt, B. 1999. *Unsteady stream depletion from ground water pumping*. Ground Water v37(1). p 98-102  
 \_\_\_\_\_  
 Herrera, N. B., Burns, E. R., and T. D. Conlon. *Simulation of Groundwater Flow and the Interaction of Groundwater and Surface Water in the Willamette Basin and Central Willamette Subbasin, Oregon*. USGS Scientific Investigations Report 2014-5136  
 \_\_\_\_\_

**D. WELL CONSTRUCTION, OAR 690-200**

D1. Well #: \_\_\_\_\_ Logid: \_\_\_\_\_

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

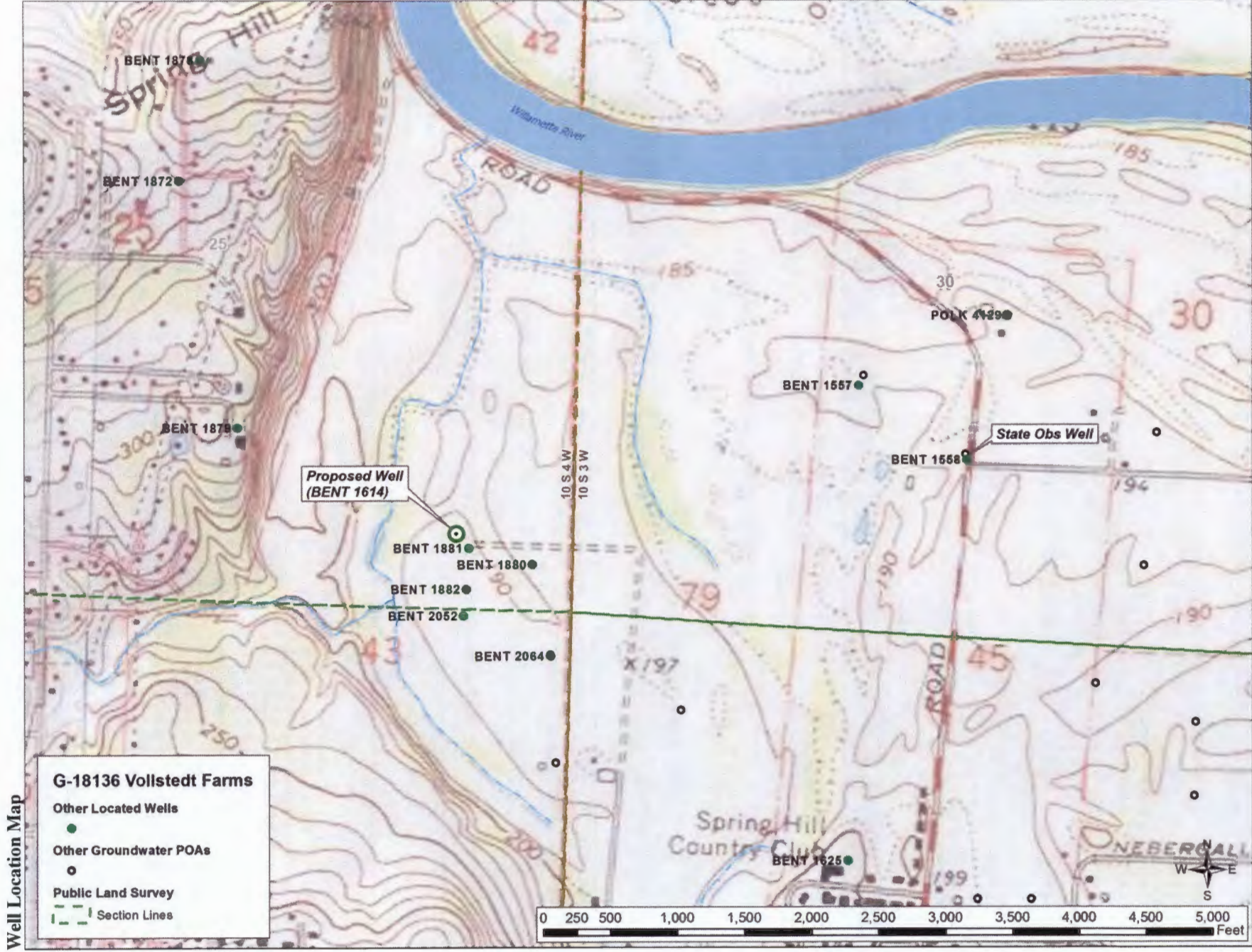
- a.  review of the well log;
- b.  field inspection by \_\_\_\_\_;
- c.  report of CWRE \_\_\_\_\_;
- d.  other: (specify) \_\_\_\_\_

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.**

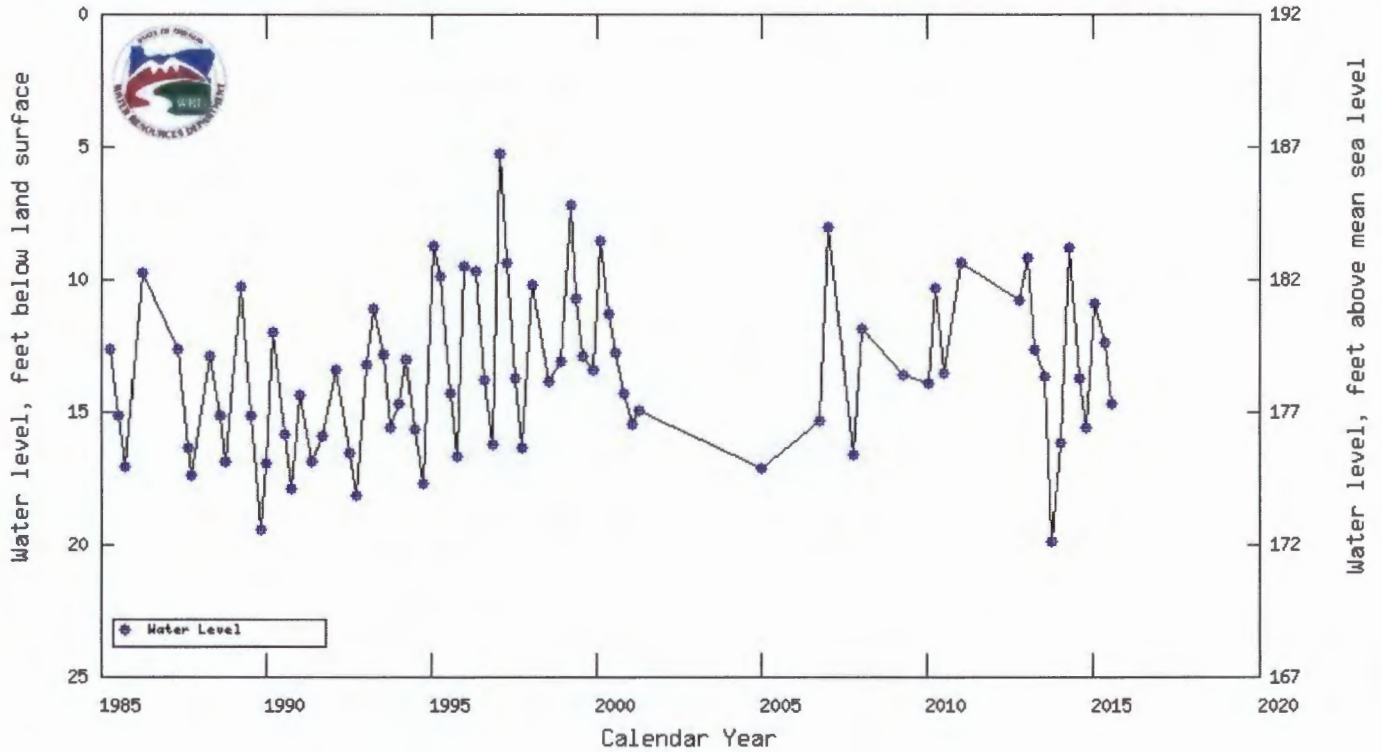
**Water Availability Tables**

WILLAMETTE R > COLUMBIA R - AB MILL CR AT GAGE 14191000							
WILLAMETTE BASIN							
Water Availability as of 10/13/2015							
Watershed ID #: 183 ( <a href="#">Map</a> )				Exceedance Level: 80% -			
Date: 10/13/2015				Time: 5:36 PM			
Water Availability Calculation		Consumptive Uses and Storages		Instream Flow Requirements		Reservations	
Water Rights				Watershed Characteristics			
<b>Water Availability Calculation</b>							
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	18,400.00	2,230.00	16,200.00	0.00	1,300.00	14,900.00	
FEB	20,100.00	7,420.00	12,700.00	0.00	1,300.00	11,400.00	
MAR	19,600.00	7,210.00	12,400.00	0.00	1,300.00	11,100.00	
APR	18,000.00	6,870.00	11,100.00	0.00	1,300.00	9,830.00	
MAY	15,500.00	4,160.00	11,300.00	0.00	1,300.00	10,000.00	
JUN	8,310.00	1,690.00	6,620.00	0.00	1,300.00	5,320.00	
JUL	4,710.00	1,450.00	3,260.00	0.00	1,300.00	1,960.00	
AUG	3,620.00	1,330.00	2,290.00	0.00	1,300.00	991.00	
SEP	3,680.00	1,150.00	2,530.00	0.00	1,300.00	1,230.00	
OCT	4,650.00	745.00	3,910.00	0.00	1,300.00	2,610.00	
NOV	9,400.00	851.00	8,550.00	0.00	1,300.00	7,250.00	
DEC	16,700.00	907.00	15,800.00	0.00	1,300.00	14,500.00	
ANN	13,500,000.00	2,150,000.00	11,300,000.00	0.00	942,000.00	10,400,000.00	



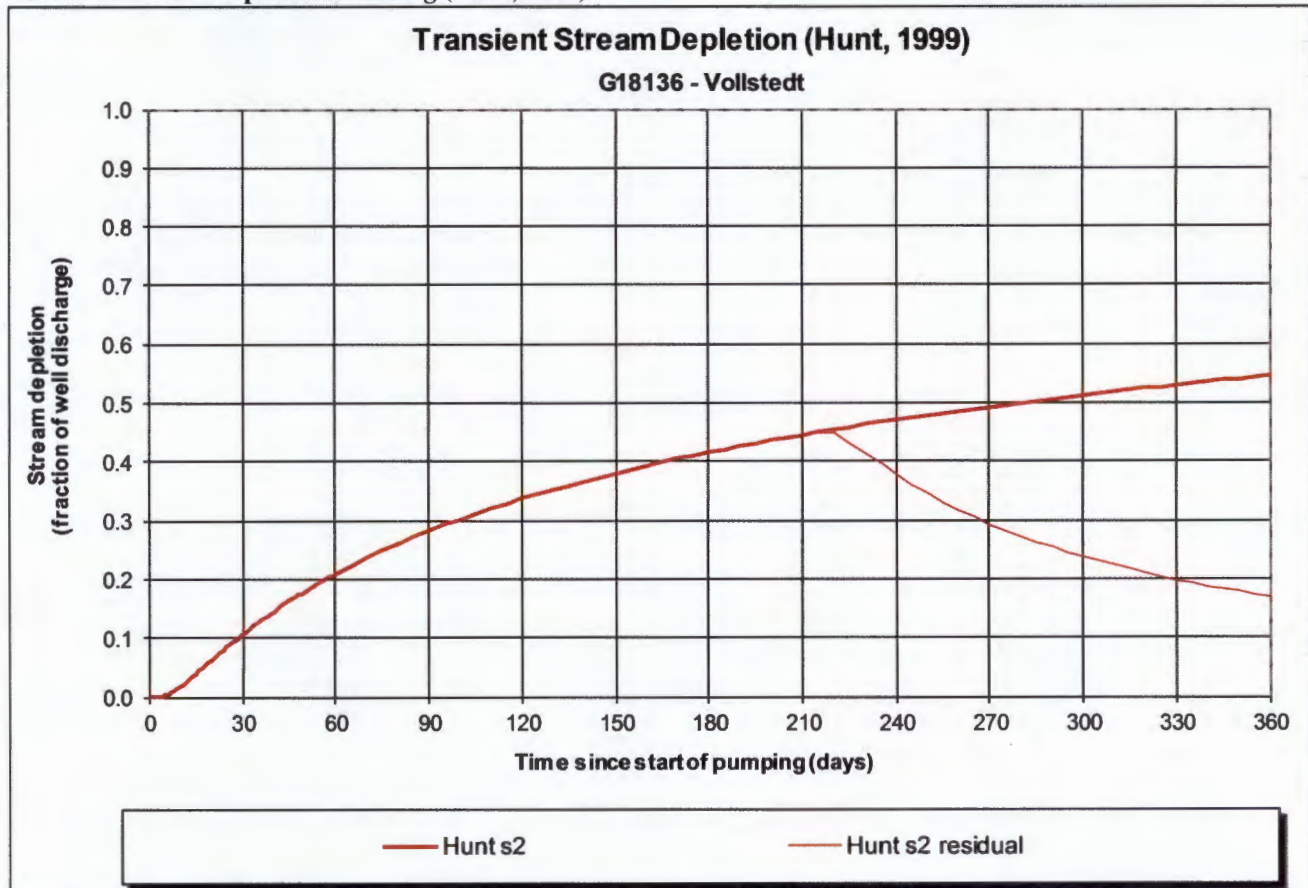
### Water-Level Trends in Nearby Well

Oregon Water Resources Department (OWRD) Well Location	10.00S/3.00W-30dbc
OWRD Logid	BENT 1558
OWRD Well Tag (Well ID)	----
OWRD State Observation Well Number	1038
Total well depth (feet below land surface)	35
Land surface elevation (feet above mean sea level)	192
Primary use of well	IRRIGATION
Primary aquifer system	Quaternary-Late Tertiary Sediment Aquifers





Results of Stream Depletion Modeling (Hunt, 1999)



Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 213 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.610	0.610	0.610	0.610	0.610	0.610	0.610	0.610	0.610	0.610	0.610	0.610
Jenk SD s2 %	35.41	51.23	59.26	64.31	67.86	70.52	72.62	41.45	25.60	18.32	14.10	11.36
Jen SD s2 cfs	0.216	0.313	0.362	0.392	0.414	0.430	0.443	0.253	0.156	0.112	0.086	0.069
Hunt SD s2 %	10.56	20.92	28.22	33.70	38.02	41.57	44.54	37.79	29.24	23.66	19.77	16.90
Hunt SD s2 cfs	0.064	0.128	0.172	0.206	0.232	0.254	0.272	0.231	0.178	0.144	0.121	0.103

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.61	0.61	0.61	cfs
Distance to stream	a	2780	2780	2780	ft
Aquifer hydraulic conductivity	K	100	600	10000	ft/day
Aquifer thickness	b	50	50	50	ft
Aquifer transmissivity	T	5000	30000	500000	ft*ft/day
Aquifer storage coefficient	S	0.2	0.2	0.2	
Stream width	ws	450	450	450	ft
Streambed hydraulic conductivity	Ks	0.1	0.1	0.1	ft/day
Streambed thickness	bs	3	3	3	ft
Streambed conductance	sbc	15	15	15	ft/day
Stream depletion factor (Jenkins)	sdf	309.1	51.5	3.1	days
Streambed factor (Hunt)	sbf	8.34	1.39	0.0834	