

# Groundwater Application Review Summary Form

Application # G- 18530

GW Reviewer DENNIS ORLOWSKI Date Review Completed: 8/18/2017

## 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 08/18/2017  
 FROM: Groundwater Section Dennis Orłowski  
Reviewer's Name  
 SUBJECT: Application G- 18530 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: Heuberger Investments, LLC County: Linn

A1. Applicant(s) seek(s) 0.1893 cfs from one well(s) in the Willamette Basin,  
North Santiam River subbasin

A2. Proposed use Irrigation and Nursery (5.51 ac) Seasonality: Irrig: 5/1-9/30 Nursery: year-round

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	LINN 2341	1	Alluvium	0.1893	T9S/R1W-S15 NW-SE	1595'N, 2340'W fr SE cor S 15

\* 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	440	27	17	8/8/1994	90	0-18	+1-90	None noted	None noted	85	40	Air

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU location is approximately one mile due south of Stayton, Oregon.

The applicant seeks to use an existing domestic well, LINN 2341, for seasonal irrigation and year-round nursery use on 5.51 acres.

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, existing well LINN 2341, produces groundwater from an unconfined aquifer. However, the well location is greater than 1/4 mile from the nearest surface water source, and thus the pertinent 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: Not applicable.

**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, 7c (7-yrs measurements);
  - 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 alluvial 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, existing well LINN 2341, obtains groundwater from unconfined sand, gravel and cobble deposits emplaced by the N. Santiam River system. There are no appreciable deposits of silt or clay noted on logs for nearby wells. The coarse alluvial deposits are the proximal portion of the Stayton Fan, are approximately 60-100 ft thick in this area, and are underlain by basalt of the Columbia River Basalt Group (Woodward and others, 1998; Conlon and others, 2005).

Groundwater development in the area is very low, with a corresponding scarcity of data. There are several reported domestic wells located within about ½ mile of the proposed POA, and possibly several more for which information is not available. Much of the area to the north, between the POA and the North Santiam River, is comprised of both former and active sand and gravel quarry operations.

LINN 50629 and LINN 51086 are alluvial aquifer wells located ~250-300 ft south of proposed Well 1 that have been unused for an extended period; the former is a current OWRD state observation well. Groundwater levels in LINN 50629 have been fairly stable for the past 20+ years, and show a seasonal range of about 4-8 ft (see attached hydrograph). An active irrigation well, LINN 51763, is adjacent to these wells and is about 350 ft to the southeast of the proposed POA. LINN 51763 is a deep basalt aquifer well, seasonal pumping of which might slightly affect groundwater levels in the shallower alluvial wells.

Despite the apparent stability of the shallow alluvial aquifer in this area, pumping from an unconfined aquifer can result in localized but relatively steep declines in groundwater levels. Thus, if a permit is granted the recommended permit conditions should be included to monitor and protect the resource and other groundwater rights in the 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	Alluvium (Willamette Aquifer – Younger)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Basis for aquifer confinement evaluation:** Well 1 (LINN 2341) produces groundwater from sands, gravels and cobbles that are Recent deposits of the North Santiam River system. There are no appreciable low-permeability silts and clays noted on nearby well logs (i.e., potential confining units), and static water levels are shallow and within the coarse-grained sediments. Thus the alluvial aquifer at this location is unconfined.

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	North Santiam River	415-420	415-450	2350	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Basis for aquifer hydraulic connection evaluation:** Estimated groundwater elevations at Well 1 are coincident with or just above the surface water elevation range of SW 1 (North Santiam River) within about one mile of the well. Furthermore, USGS groundwater maps for the area show that SW 1 is a gaining reach in this area (Woodward and others, 1998; Conlon and others, 2005). These facts indicate that the alluvial aquifer tapped by Well 1 is hydraulically connected to SW1.

**Water Availability Basin the well(s) are located within:** North Santiam River > Santiam River – at mouth (WID 141).

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"/>	MF141A	430.00	<input type="checkbox"/>	627.00	<input type="checkbox"/>	<25%	<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"/>

**Comments:** C3a: The Hunt 1999 analytical stream depletion model was used to estimate 30-day interference at SW 1 (N. Santiam River) caused by pumping of Well 1. Model results indicate that interference is expected to be less than 25% at 30 days.

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
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
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.													
(B) = 80 % Nat. Q													
(C) = 1 % Nat. Q													
(D) = (A) > (C)													
(E) = (A / B) x 100		%	%	%	%	%	%	%	%	%	%	%	%

(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:** Not applicable.

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

**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.

**References Used:** Application file: G-18530.

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.

Gannett, 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.

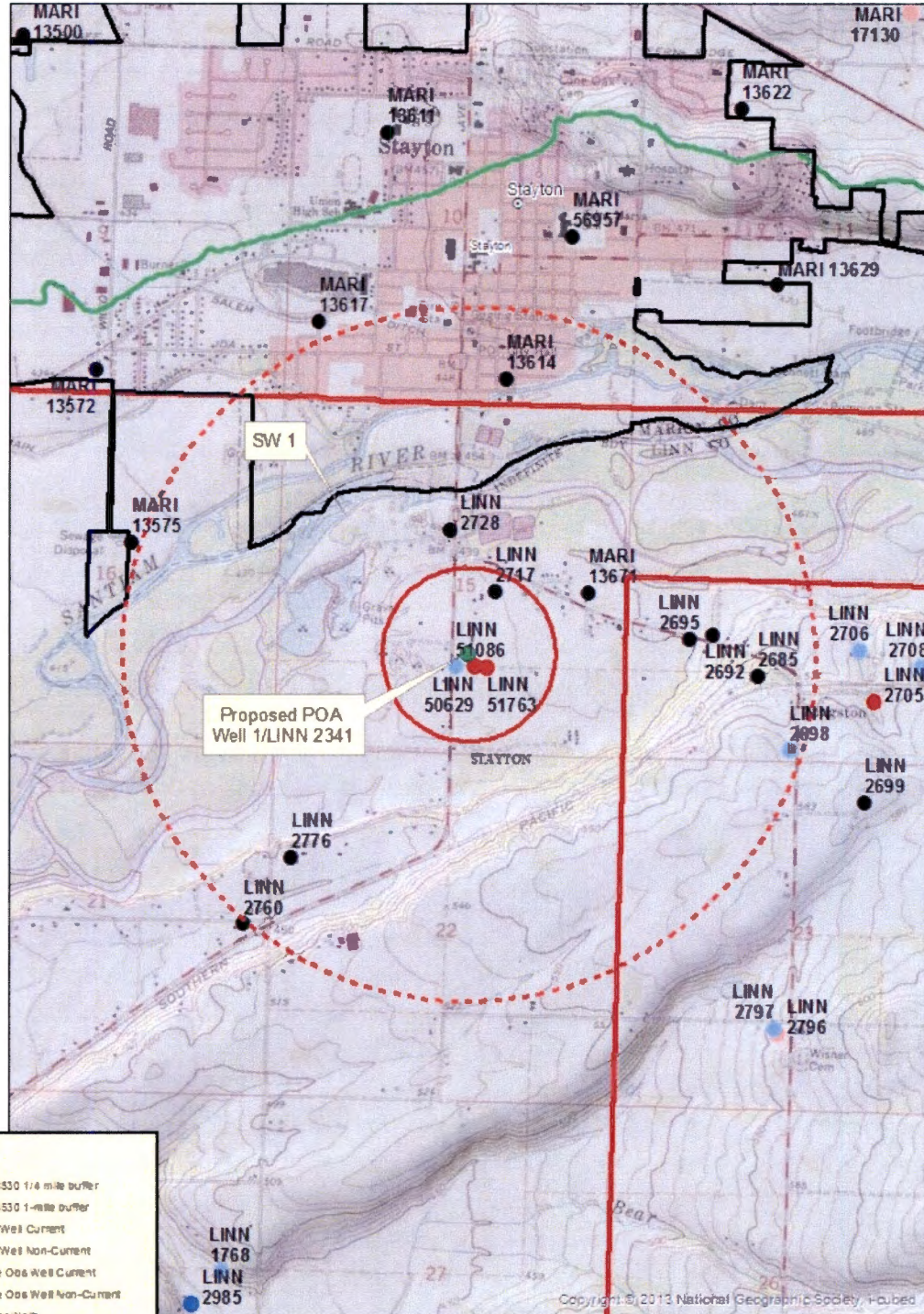
Hunt, B., 1999, Unsteady stream depletion from ground water pumping: Ground Water, v. 37, no. 1, p. 98-102.

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

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.

Well Location Map

# Application G-18530 Heuberger T9S, R1W Section 15



**Legend**

- G-18530 1/4 mile buffer
- G-18530 1-mile buffer
- Obs Well Current
- Obs Well Non-Current
- State Obs Well Current
- State Obs Well Non-Current
- Other Wells
- Water Availability Basins
- Ground Water Restricted areas



**Water Availability Table**

Oregon Water Resources Department  
Water Availability Analysis

Main Help  
Return Contact Us

**Water Availability Analysis  
Detailed Reports**

N SANTIAM R > SANTIAM R - AT MOUTH  
WILLAMETTE BASIN

Water Availability as of 8/17/2017

Watershed ID # 141 [\(Map\)](#)  
Date: 8/17/2017

Exceedance Level: 80%  
Time 11:29 AM

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

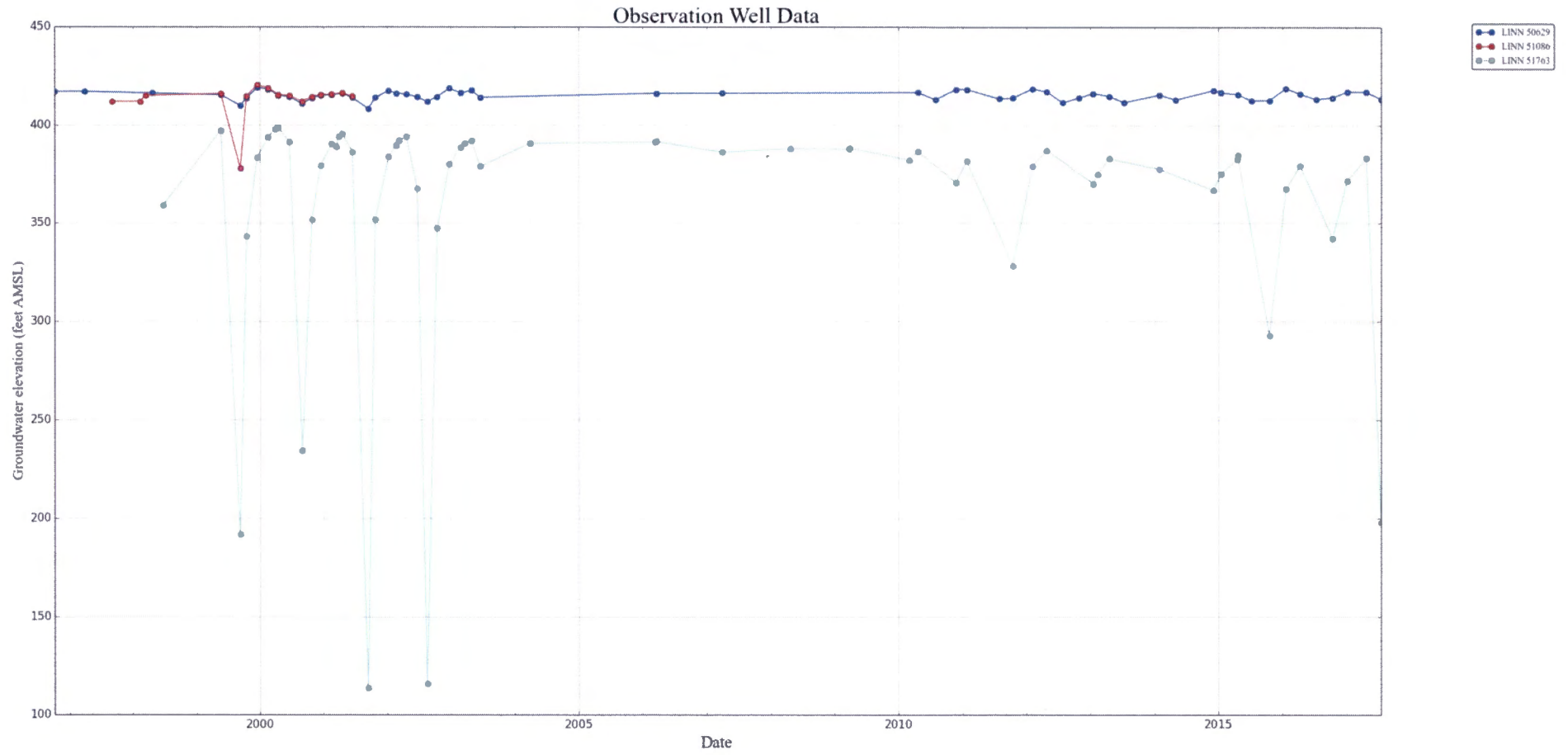
**Water Availability Calculation**

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	2,330.00	480.00	1,850.00	0.00	430.00	1,420.00
FEB	2,670.00	1,490.00	1,180.00	0.00	430.00	751.00
MAR	2,540.00	1,320.00	1,220.00	0.00	430.00	792.00
APR	2,500.00	1,480.00	1,020.00	0.00	430.00	589.00
MAY	2,590.00	802.00	1,790.00	0.00	430.00	1,360.00
JUN	1,500.00	434.00	1,070.00	0.00	430.00	636.00
JUL	858.00	331.00	527.00	0.00	430.00	97.10
AUG	661.00	317.00	344.00	0.00	430.00	-86.10
SEP	627.00	295.00	332.00	0.00	430.00	-97.70
OCT	694.00	264.00	430.00	0.00	430.00	-0.29
NOV	1,380.00	266.00	1,110.00	0.00	430.00	684.00
DEC	2,540.00	267.00	2,270.00	0.00	430.00	1,840.00
ANN	1,960,000.00	463,000.00	1,500,000.00	0.00	312,000.00	1,190,000.00



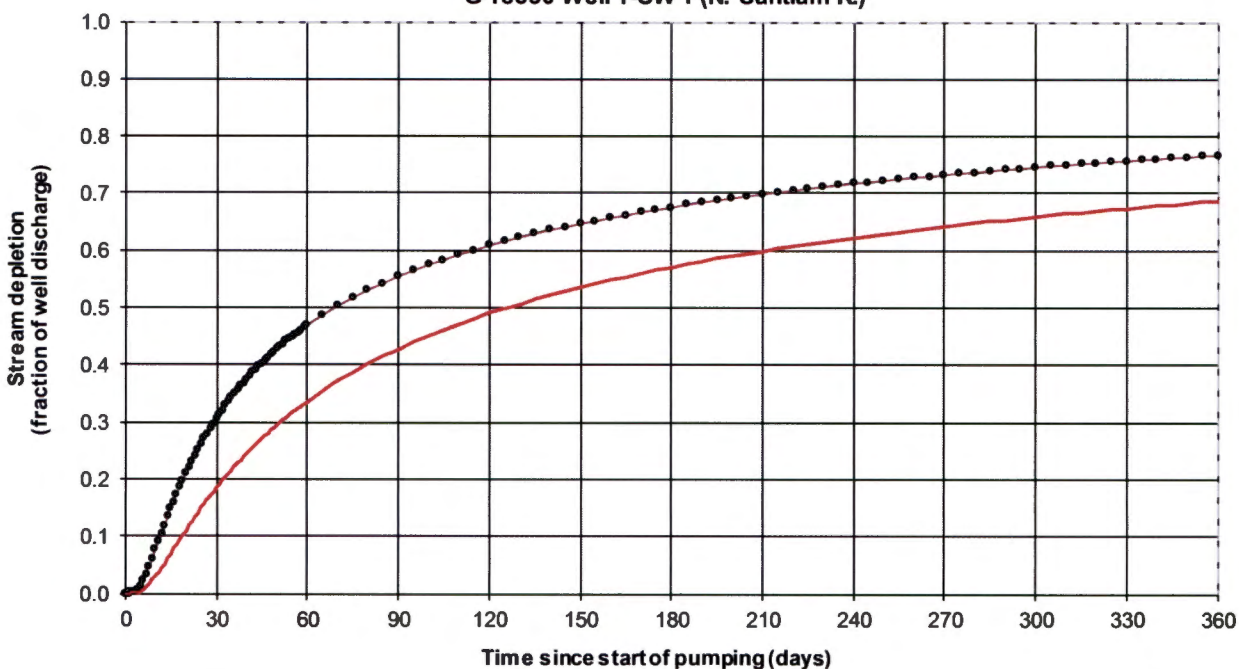
Water-Level Trends in Nearby Wells



Hunt 1999 Stream Depletion Model Results

Transient Stream Depletion (Jenkins, 1970; Hunt, 1999)

G-18530 Well 1-SW 1 (N. Santiam R.)



Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 365 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189
Jenk SD s2 %	30.51	46.83	55.38	60.81	64.65	67.54	69.83	71.69	73.24	74.57	75.71	76.72
Jen SD s2 cfs	0.058	0.089	0.105	0.115	0.122	0.128	0.132	0.136	0.139	0.141	0.143	0.145
Hunt SD s2 %	<b>18.38</b>	33.60	42.77	48.98	53.54	57.06	59.89	62.22	64.19	65.89	67.36	68.65
Hunt SD s2 cfs	0.035	0.064	0.081	0.093	0.101	0.108	0.113	0.118	0.122	0.125	0.128	0.130

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.1893	0.1893	0.1893	cfs
Distance to stream	a	2350	2350	2350	ft
Aquifer hydraulic conductivity	K	50	250	1000	ft/day
Aquifer thickness	b	70	70	70	ft
Aquifer transmissivity	T	3500	17500	70000	ft*ft/day
Aquifer storage coefficient	S	0.2	0.2	0.2	
Stream width	ws	120	120	120	ft
Streambed hydraulic conductivity	Ks	1	1	1	ft/day
Streambed thickness	bs	3	3	3	ft
Streambed conductance	sbc	40	40	40	ft/day
Stream depletion factor (Jenkins)	sdf	315.5714286	63.11428571	15.77857143	days
Streambed factor (Hunt)	sbf	26.85714286	5.371428571	1.342857143	