

# Water Right Conditions Tracking Slip

Groundwater/Hydrology Section

FILE # # G-17788

ROUTED TO: Water Rights

TOWNSHIP/

RANGE-SECTION: 10S/2W-17

CONDITIONS ATTACHED?:  yes  no

REMARKS OR FURTHER INSTRUCTIONS:

Reviewer: Karl Wozniak



1942

1942

**PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS**

TO: Water Rights Section Date September 23, 2014  
 FROM: Groundwater Section Karl Wozniak  
Reviewer's Name  
 SUBJECT: Application G- 17788 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: Avinelis County: Linn

A1. Applicant(s) seek(s) 2.42 cfs from 4 well(s) in the Willamette Basin,  
North Santiam River subbasin Quad Map: Crabtree

A2. Proposed use Irrigation & Temperature Control Seasonality: March 1 – Oct 31

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 4166	1	Alluvium	2.42	10S/02W-17 SW/NW	1425' S, 775' E fr NW cor S17
2	LINN 61004	2	Alluvium	2.42	10S/02W-17 NE/NW	275' S, 1810' E fr NW cor S17
3	LINN 4165	3	Alluvium	2.42	10S/02W-17 NW/NW	457' S, 770' E fr NW cor S17
4	LINN 60537	4	Alluvium	2.42	10S/02W-17 NW/SW	237' S, 487' E fr W1/4 cor S17
5						

\* 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*	260		17	06/30/1940	21	?	0-21			?		
2	262				21	?	0-21			?		
3	260		14	02/20/1962	27	?	0-27		21-26	600	3	Pump
4	252	20	5	09/03/2013	60	0-18	0-59		32-59	600		Air

Use data from application for proposed wells.

A4. **Comments:** \* Construction data for Well 1 is from GR-1858 registration form. Well 1 (LINN 4166) is also a POA on GR-1858; Well 2 (LINN 61004) is also a POA on GR-1859; Well 3 (LINN 4165) is also a POA on certificate 33850. Most of the irrigated acres proposed for this right are already listed on other rights or claims served by the same wells. Wells 1 and 2, and possibly 3, do not likely meet current well construction standards. The owner has indicated on the application form that he would reconstruct the wells or replace them as needed.

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 wells are greater than 1/4 mile from a surface water source so the pertinent 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) Large 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 area beneath the proposed irrigated lands and wells is underlain by 60-70 feet of coarse-grained Holocene floodplain deposits associated with the North Santiam River. The water table occurs at shallow depths and groundwater levels approximate the stage of adjacent reaches of the river. The alluvial floodplain aquifer is unconfined and highly permeable. Groundwater level data is sparse in the area but water levels are likely to be stable since well production will be buffered by capture from the adjacent stream. Domestic and irrigation well densities are quite low in the surrounding area. Most of the nearby irrigation wells are at least ¼ mile away from the proposed wells on this permit. Because the aquifer is unconfined and reasonably thick and well density is relatively low, interference from the proposed wells is unlikely to be excessive.

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\_\_\_\_\_

**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	Alluvial	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Alluvial	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Alluvial	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Alluvial	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer confinement evaluation:** The wells produce from coarse-grained Holocene alluvium. General knowledge indicates that the aquifer 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	240	235-260	2330	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	North Santiam River	240	235-260	2650	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	1	North Santiam River	240	235-260	1970	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	1	North Santiam River	240	235-260	1890	<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"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer hydraulic connection evaluation:** Published water table contour maps show that groundwater flows toward, and discharges into, the North Santiam River. The floodplain aquifer and the streambed are largely composed of permeable sands and gravels so groundwater should be able to move freely between the stream and the aquifer.

**Water Availability Basin the well(s) are located within:** N Santiam R > Santiam R – 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	<input type="checkbox"/>	<input type="checkbox"/>	MF141	430	<input type="checkbox"/>	267	<input type="checkbox"/>	33	<input checked="" type="checkbox"/>
2	1	<input type="checkbox"/>	<input type="checkbox"/>	MF141	430	<input type="checkbox"/>	267	<input type="checkbox"/>	30	<input checked="" type="checkbox"/>
3	1	<input type="checkbox"/>	<input type="checkbox"/>	MF141	430	<input type="checkbox"/>	267	<input type="checkbox"/>	37	<input checked="" type="checkbox"/>
4	1	<input type="checkbox"/>	<input type="checkbox"/>	MF141	430	<input type="checkbox"/>	267	<input type="checkbox"/>	38	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<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.

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

**Comments:** The Hunt99 (Hunt, 1999) model was used to estimate stream interference after 30 days of pumping. A value of 1000 ft/day was used for the hydraulic conductivity of the Holocene floodplain sediments based on the high yields and high specific capacity of nearby wells and field observations and mapped descriptions that show the unit to be unconsolidated sand and gravel. Streambed conductivity was assumed to be 1 feet per day, the equivalent of a silty sand. A sand and gravel streambed is more likely based on field observations in other areas. The model parameters and results for the closest well, MARI 60537, Well 4) are included at the end of this review.

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													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
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:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**References Used:**  
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.  
O'Connor, J.E., Sarna-Wojcicki, A., Wozniak, K.C., Polette, D.J., and Fleck, R.J., 2001: U.S. Geological Survey Professional Paper 1620.  
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 #: 1, 2, & 3 Logid: LINN 4166, LINN 61004, & LINN 4165

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:** No apparent or likely seal in Well 1 and Well 2. No documented seal in Well 3.

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

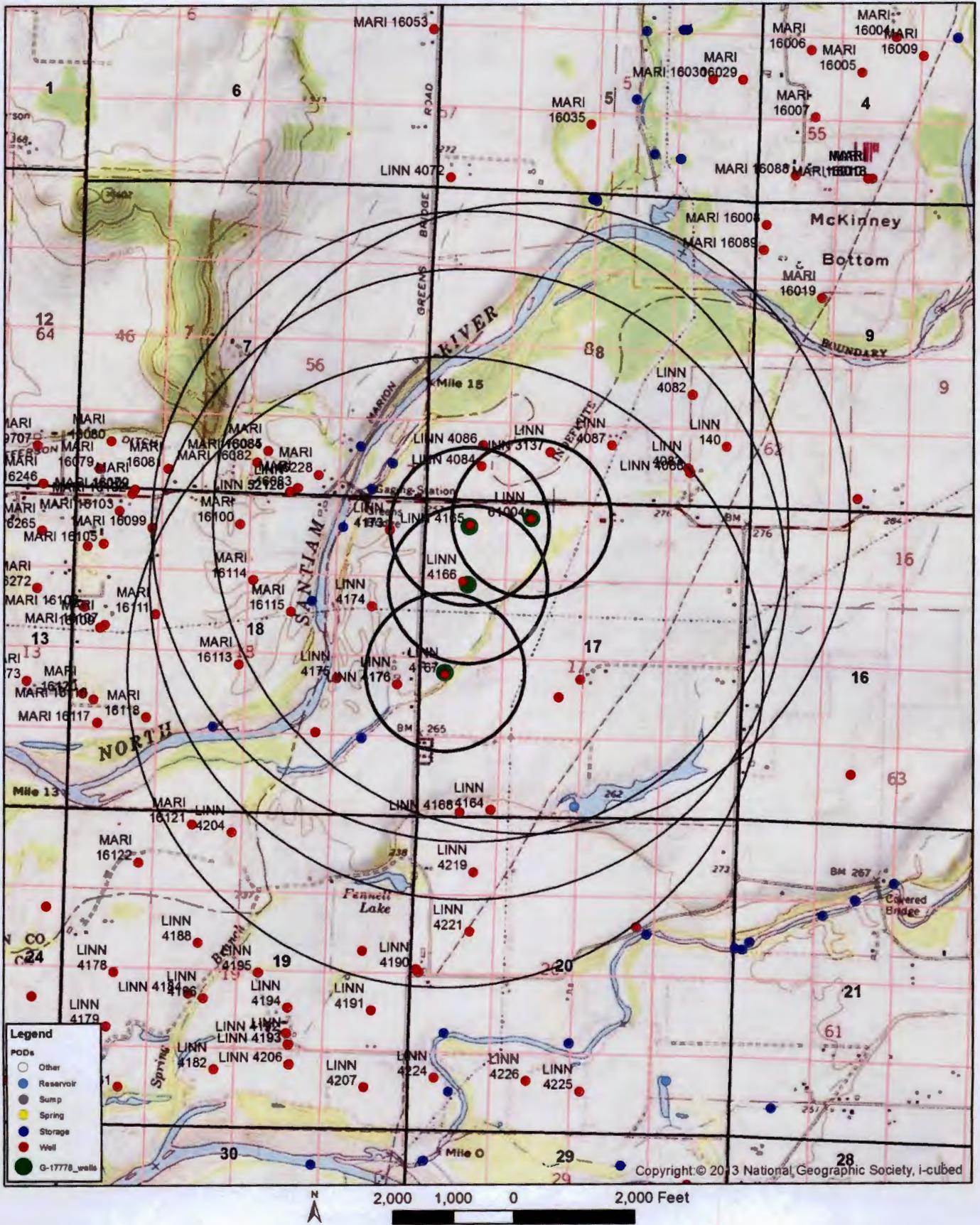
**Water Availability Tables**

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

Watershed ID #: 141 N SANTIAM R > SANTIAM R - AT MOUTH Exceedance Level: 80  
 Time: 2:28 PM Basin: WILLAMETTE Date: 09/22/2014

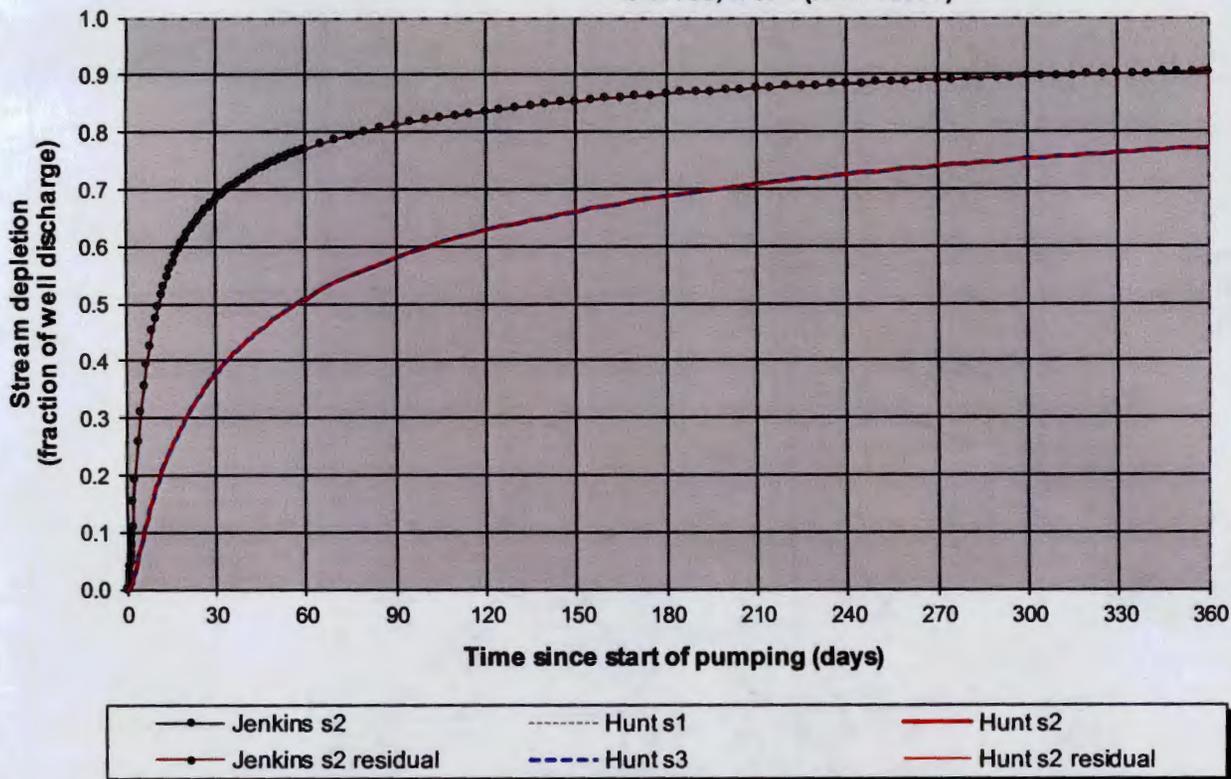
Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.						
JAN	2,330.00	482.00	1,850.00	0.00	430.00	1,420.00
FEB	2,670.00	1,490.00	1,180.00	0.00	430.00	749.00
MAR	2,540.00	1,320.00	1,220.00	0.00	430.00	790.00
APR	2,500.00	1,480.00	1,020.00	0.00	430.00	587.00
MAY	2,590.00	804.00	1,790.00	0.00	430.00	1,360.00
JUN	1,500.00	436.00	1,060.00	0.00	430.00	634.00
JUL	858.00	333.00	525.00	0.00	430.00	94.70
AUG	661.00	320.00	341.00	0.00	430.00	-88.60
SEP	627.00	297.00	330.00	0.00	430.00	-100.00
OCT	694.00	267.00	427.00	0.00	430.00	-2.79
NOV	1,380.00	268.00	1,110.00	0.00	430.00	682.00
DEC	2,540.00	269.00	2,270.00	0.00	430.00	1,840.00
ANN	1,960,000	465,000	1,500,000	0	312,000	1,190,000

### G-17788, Avelis (Quiet Meadows Farm)



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

G-17788, Well 4 (LINN 60537)



Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 360 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	2.420	2.420	2.420	2.420	2.420	2.420	2.420	2.420	2.420	2.420	2.420	2.420
Jenk SD %	0.680	0.771	0.812	0.837	0.854	0.866	0.876	0.884	0.891	0.896	0.901	0.905
Jen SD cfs	1.646	1.865	1.965	2.025	2.066	2.096	2.120	2.139	2.155	2.169	2.181	2.191
Hunt SD %	0.377	0.509	0.580	0.627	0.661	0.687	0.708	0.725	0.740	0.752	0.763	0.772
Hunt SD cfs	0.912	1.231	1.404	1.518	1.600	1.663	1.714	1.755	1.790	1.820	1.846	1.869

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	2.42	2.42	2.42	cfs
Distance to stream	a	1890	1890	1890	ft
Aquifer hydraulic conductivity	K	1000	1000	1000	ft/day
Aquifer thickness	b	70	70	70	ft
Aquifer transmissivity	T	70000	70000	70000	ft <sup>2</sup> /day
Aquifer storage coefficient	S	0.2	0.2	0.2	
Stream width	ws	150	150	150	ft
Streambed hydraulic conductivity	Ks	1	1	1	ft/day
Streambed thickness	bs	3	3	3	ft
Streambed conductance	sbc	50	50	50	ft/day
Stream depletion factor (Jenkins)	sdf	10.206	10.206	10.206	days
Streambed factor (Hunt)	sbf	1.35	1.35	1.35	