



PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date September 19, 2016  
 FROM: Groundwater Section Michael J. Thoma  
Reviewer's Name  
 SUBJECT: Application G- 18334 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: Stefan Aumack; Kalapuya HS County: Lane

A1. Applicant(s) seek(s) 0.05 cfs from 1 well(s) in the Willamette Basin,  
Upper Willamette subbasin

A2. Proposed use Irrigation (4.0 ac) Seasonality: Mar 1 – Oct 31 (244 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	Proposed	1	Alluvium	0.05	17S/04W-20 SESE	986'N, 455'W of SE cor S 20
2						
3						

\* 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	385		10-20		100*	0-18	+1-18					

Use data from application for proposed wells.

A4. **Comments:** \*The applicant's well is proposed and only Casing Depth, Seal Depth, and Source Aquifer were provided on the application. USGS Aquifer Maps (Gannett and Caldwell 1998) show the alluvium in the area is < 100 ft thick and the majority of the wells in the area are < 50 ft deep (likely due to bedrock encountered at greater depths). This review will assume that the well is < 100 ft deep.

A5.  **Provisions of the** Willamette (OAR 690-502) 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 not within 1/4 mile of any surface water sources

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 SWL 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 Alluvial groundwater reservoir between approximately 0 ft. and 100 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:** There are no OWRD observation wells in the vicinity of the proposed POA that report SWL data but there are some permitted groundwater POAs (nearest is approx. ¼ mile away). Groundwater over-appropriation cannot be explicitly determined but the alluvial aquifer is likely strongly hydraulically connected to surface water and so seasonal withdrawals from irrigation are replenished by surface water in the winter/spring – this is supported by SWL data in other parts of the Southern Willamette Valley alluvial sediments.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**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 of Willamette Aquifer	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer confinement evaluation:** the applicant's well is proposed with minimum casing and seal depth of 18 ft and so may be constructed to produce water from the upper portion of the aquifer. There may be confining, low-permeability layers at depth, but at the minimum depth of 18 ft bls it is likely 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	Amazon Cr	375	370-380	3000	<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"/>

**Basis for aquifer hydraulic connection evaluation:** coincident GW and SW elevations

**Water Availability Basin the well(s) are located within:** Long Tom R > Willamette R – AB Mouth (ID# 114)

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"/>	None	NA	<input type="checkbox"/>	32.1	<input type="checkbox"/>	< 1%	<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:** Interference was calculated using the Hunt (1999) stream-depletion model and a range of realistic parameters for the alluvial aquifer (Herrera et al., 2014). Results are attached.

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"/>

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

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	<b>No surface water sources beyond 1 mile were evaluated</b>												
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:** \_\_\_\_\_

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:** The applicant's proposed wells would be producing from an aquifer that has been found to be hydraulically connected to surface water at a distance of < 1 mile. However, the department is unable to find sufficient evidence that the proposed use will have the Potential for Substantial Interference per OAR 690-009

**References Used:**

Gannett, M. W. and R. R. Caldwell. 1998. *Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington*. USGS Professional Paper 1424-A.

Herrera, N. B., Burns, E. R., and T. D. Conlon. 2014. *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.

Hunt, B. 1999. *Unsteady Stream Depletion from Ground Water Pumping*. Journal of Hydrologic Engineering, Vol 8(1), pp 12-19

Woodward, D. G., M. W. Gannett, and J. J. Vaccaro. 1998. *Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington*. USGS Professional Paper 1424-B.

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

\_\_\_\_\_

\_\_\_\_\_

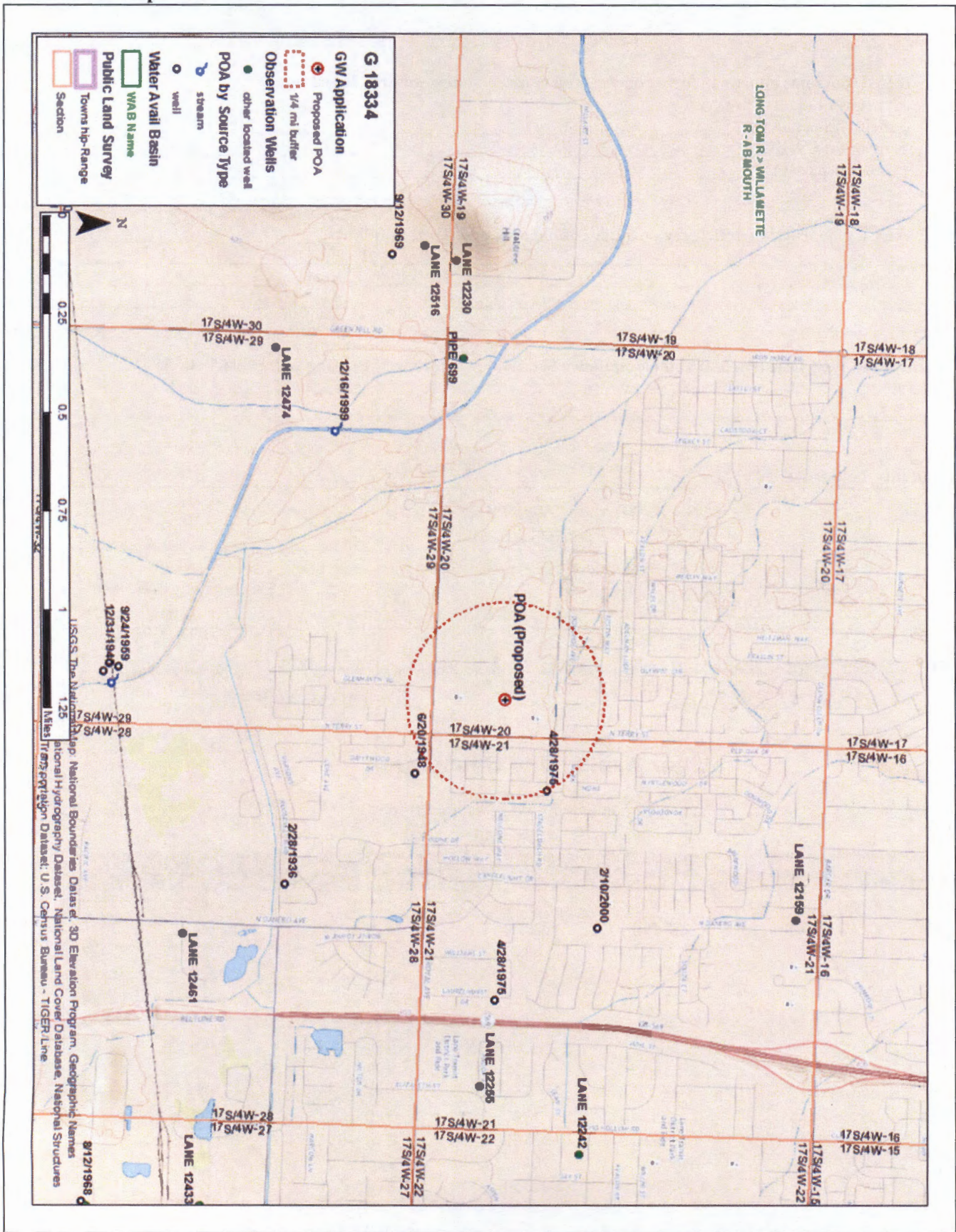
\_\_\_\_\_

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

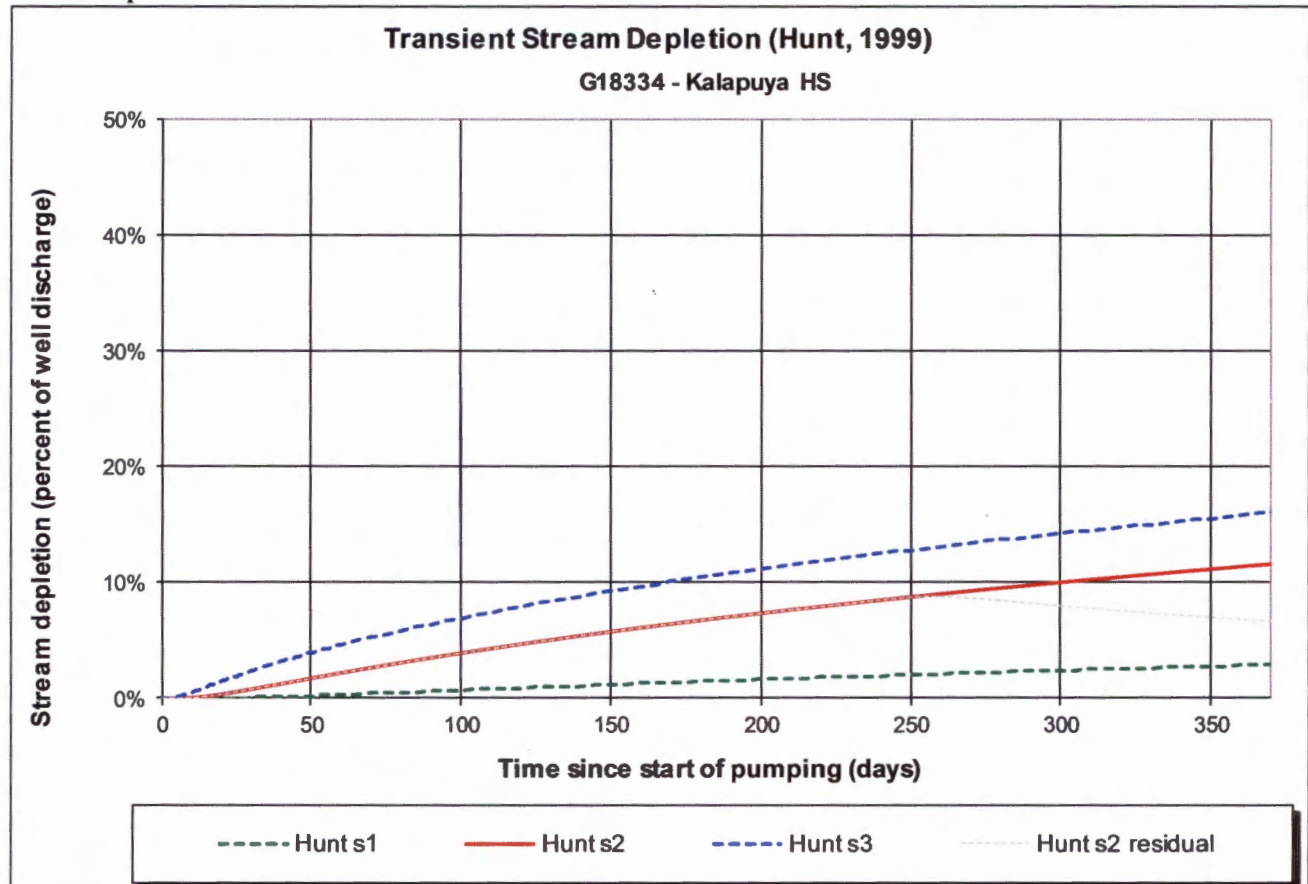
**Water Availability Tables**

LONG TOM R > WILLAMETTE R - AB MOUTH WILLAMETTE BASIN							
Water Availability as of 9/19/2016							
Watershed ID #: 114 ( <a href="#">Map</a> )				Exceedance Level: 80% -			
Date: 9/19/2016				Time: 1:47 PM			
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	568.00	150.00	418.00	0.00	0.00	418.00	
FEB	697.00	389.00	308.00	0.00	0.00	308.00	
MAR	596.00	556.00	40.20	0.00	0.00	40.20	
APR	373.00	250.00	123.00	0.00	0.00	123.00	
MAY	215.00	64.70	150.00	0.00	0.00	150.00	
JUN	105.00	30.30	74.70	0.00	0.00	74.70	
JUL	50.60	47.60	2.99	0.00	0.00	2.99	
AUG	35.40	38.40	-2.97	0.00	0.00	-2.97	
SEP	32.10	22.20	9.93	0.00	0.00	9.93	
OCT	35.30	6.50	28.80	0.00	0.00	28.80	
NOV	82.50	6.22	76.30	0.00	0.00	76.30	
DEC	364.00	106.00	258.00	0.00	0.00	258.00	
ANN	362,000.00	99,800.00	262,000.00	0.00	0.00	262,000.00	

Well Location Map



Stream-depletion Model Results



**Output for Hunt Stream Depletion, Scenerio 2 (s2):** Time pump on = 244 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Jenk SD s2 %	<b>22.07</b>	38.65	47.95	54.03	58.39	61.71	64.34	66.50	49.48	32.85	24.25	19.03
Jen SD s2 cfs	0.011	0.019	0.024	0.027	0.029	0.031	0.032	0.033	0.025	0.016	0.012	0.010
Hunt SD s2 %	<b>0.79</b>	2.20	3.51	4.69	5.76	6.74	7.64	8.48	8.66	8.00	7.37	6.84
Hunt SD s2 cfs	0.000	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	0.05	0.05	0.05	cfs
Distance to stream	a	3000	3000	3000	ft
Aquifer hydraulic conductivity	K	50	100	300	ft/day
Aquifer thickness	b	100	100	100	ft
Aquifer transmissivity	T	5000	10000	30000	ft*ft/day
Aquifer storage coefficient	S	0.1	0.1	0.1	
Stream width	ws	25	25	25	ft
Streambed hydraulic conductivity	Ks	0.01	0.05	0.1	ft/day
Streambed thickness	bs	2	2	2	ft
Streambed conductance	sbc	0.125	0.625	1.25	ft/day
Stream depletion factor (Jenkins)	sdf	180.0	90.0	30.0	days
Streambed factor (Hunt)	sbf	0.1	0.2	0.1	