

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 04/26/2016
 FROM: Groundwater Section Phillip I. Marcy
 SUBJECT: Application G- 18266 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: Stephen Montecucco County: Clackamas

A1. Applicant(s) seek(s) 0.45 cfs from 1 well(s) in the Willamette Basin,
Molalla subbasin

A2. Proposed use Irrigation Seasonality: Year-round (365 days)

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	0.45	3S/1E-29 SE-NE	500' N, 100' W fr E ¼ cor S 29
2						
3						
4						
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	145	NA	NA	NA	325	?	325	?	?	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** No seal interval given. Since the applicant proposes to case the entire depth of the well, it is assumed for this review that the casing will only be perforated through the proposed production zone.

A5. **Provisions of the** Willamette (690-502-0020) 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: _____

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;
 - 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 Sand and gravel groundwater reservoir between approximately 200 ft. and 300 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:** Nearby irrigation well CLAC 9698 appears to produce from the proposed aquifer system on this application, and water level data show this system to be relatively stable on an annual basis (see attached hydrograph). Therefore, further development of this aquifer system will not likely injure the rights of senior groundwater users in the area or impair the long-term stability of the groundwater resource here. If a permit is issued, the conditions set forth in B1 and B2 shall be applied to ensure that the Department has the ability to monitor and maintain the resource.

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	Sand and Gravel	<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"/>

Basis for aquifer confinement evaluation: Nearby well logs do not report a significant barrier to vertical migration of groundwater, nor is there evidence for a difference in head elevation between different production zones (Fig. 2).

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	2	Molalla River	80	76	2050	<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"/>
						<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: Sands and gravels penetrated by the proposed POA well are likely in good hydraulic connection with the Molalla River due to a lack of a significant barrier to vertical flow. Groundwater and surface water elevations are in close correspondence.

Water Availability Basin the well(s) are located within: Molalla R > Willamette 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"/>	IS69796A	100	<input type="checkbox"/>	134	<input type="checkbox"/>	5.7	<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"/>		<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: Local pump tests were utilized to calculate a value for transmissivity within the proposed aquifer system, which in turn was used to calculate expected interference to the Molalla River from pumping at the proposed POA rate and location (Fig. 3). After 30 days of pumping, the calculated fraction of groundwater resulting from stream interference is 5.7%, rising to 40% or a rate of 0.18 cfs after an entire year.

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													
		%	%	%	%	%	%	%	%	%	%	%	%
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: This section does not apply.

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:** Groundwater produced from the proposed location is expected to have negligible impacts to surface water, likely diffused over a large area. At this time, it appears that the proposed aquifer system maintains a hydraulic gradient towards the Molalla River, and continued monitoring via conditions set forth herein shall provide the Department evidence of any changes in this head relationship.

References Used: Gannett, M.W., and Caldwell, R.R. 1998. Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington: U.S. Geological Survey PP-1424-A, scale 1:250,000.

Local well logs, local pump tests.

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

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

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION						
Watershed ID #: 69796		MOLALLA R > WILLAMETTE R - AT MOUTH			Exceedance Level: 80	
Time: 9:28 AM		Basin: WILLAMETTE			Date: 04/26/2016	
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	1,870.00	153.00	1,720.00	0.00	500.00	1,220.00
FEB	2,010.00	143.00	1,870.00	0.00	500.00	1,370.00
MAR	1,830.00	115.00	1,720.00	0.00	500.00	1,220.00
APR	1,530.00	88.20	1,440.00	0.00	500.00	942.00
MAY	927.00	98.20	829.00	0.00	500.00	329.00
JUN	431.00	119.00	312.00	0.00	500.00	-188.00
JUL	204.00	183.00	21.10	0.00	200.00	-179.00
AUG	139.00	154.00	-15.20	0.00	100.00	-115.00
SEP	134.00	83.30	50.70	0.00	150.00	-99.30
OCT	188.00	41.70	146.00	0.00	450.00	-304.00
NOV	637.00	78.80	558.00	0.00	500.00	58.20
DEC	1,700.00	149.00	1,550.00	0.00	500.00	1,050.00
ANN	1,320,000	85,000	1,240,000	0	295,000	966,000

WATER AVAILABILITY TABLE															
Watershed ID #: 69796		MOLALLA R > WILLAMETTE R - AT MOUTH						Exceedance Level: 80							
Time: 9:30 AM		Basin: WILLAMETTE						Date: 04/26/2016							
# watershed	Nest ID Number	Stream Name	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	STOR
1	181	WILLAMETTE R > COLUMBIA R - AT MOUTH	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
2	69796	MOLALLA R > WILLAMETTE R - AT MOUTH	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	YES	YES	YES

Well Location Map



Water-Level Trends in Nearby Wells

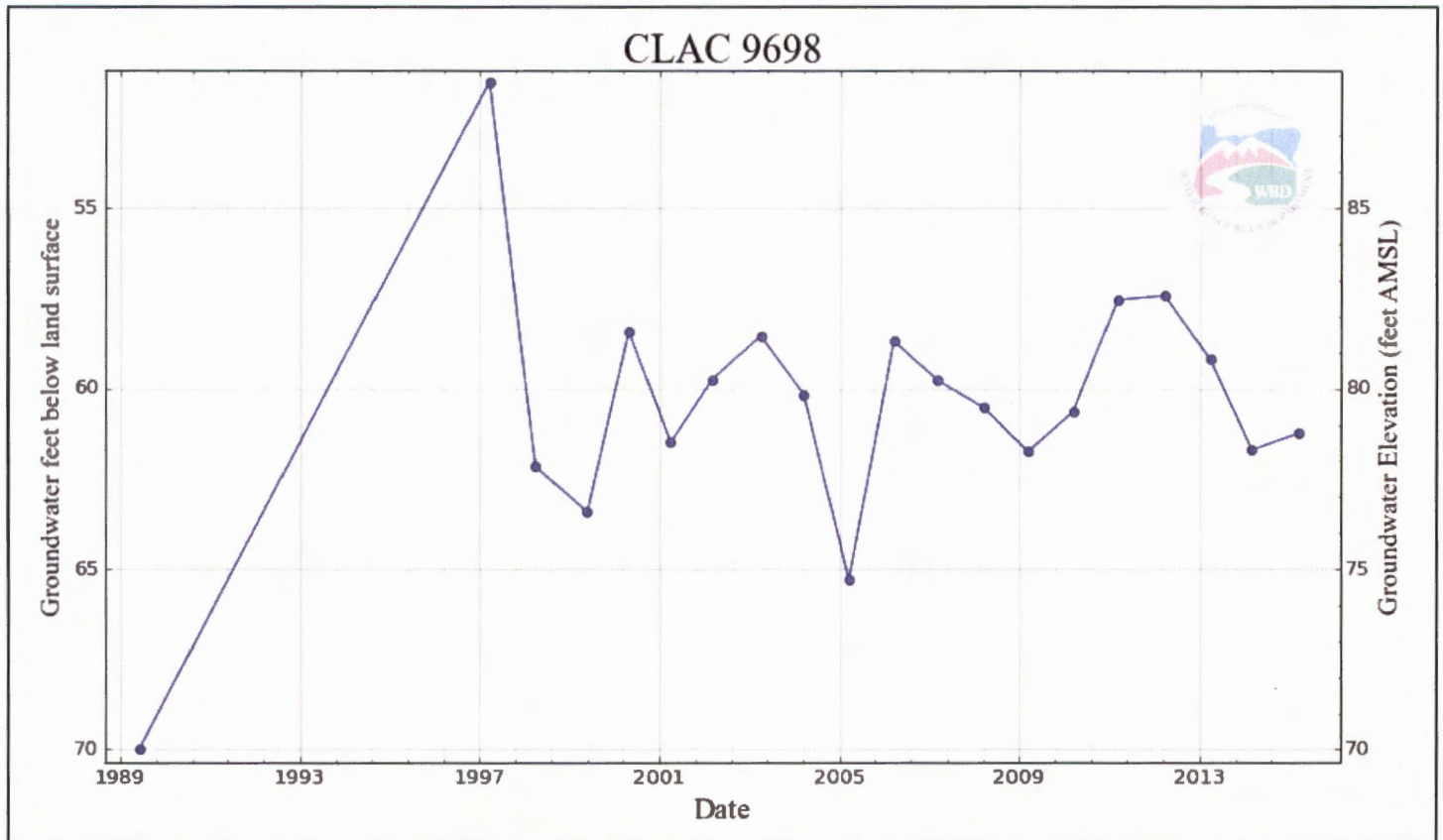


Figure 1: Static water level data from nearby well CLAC 9698 (~3000' ESE of proposed POA) show stable groundwater elevations for the past two decades. The construction of the proposed POA well is similar to that of CLAC 9698, which produces from sand and gravel at depths below 200' below land surface.

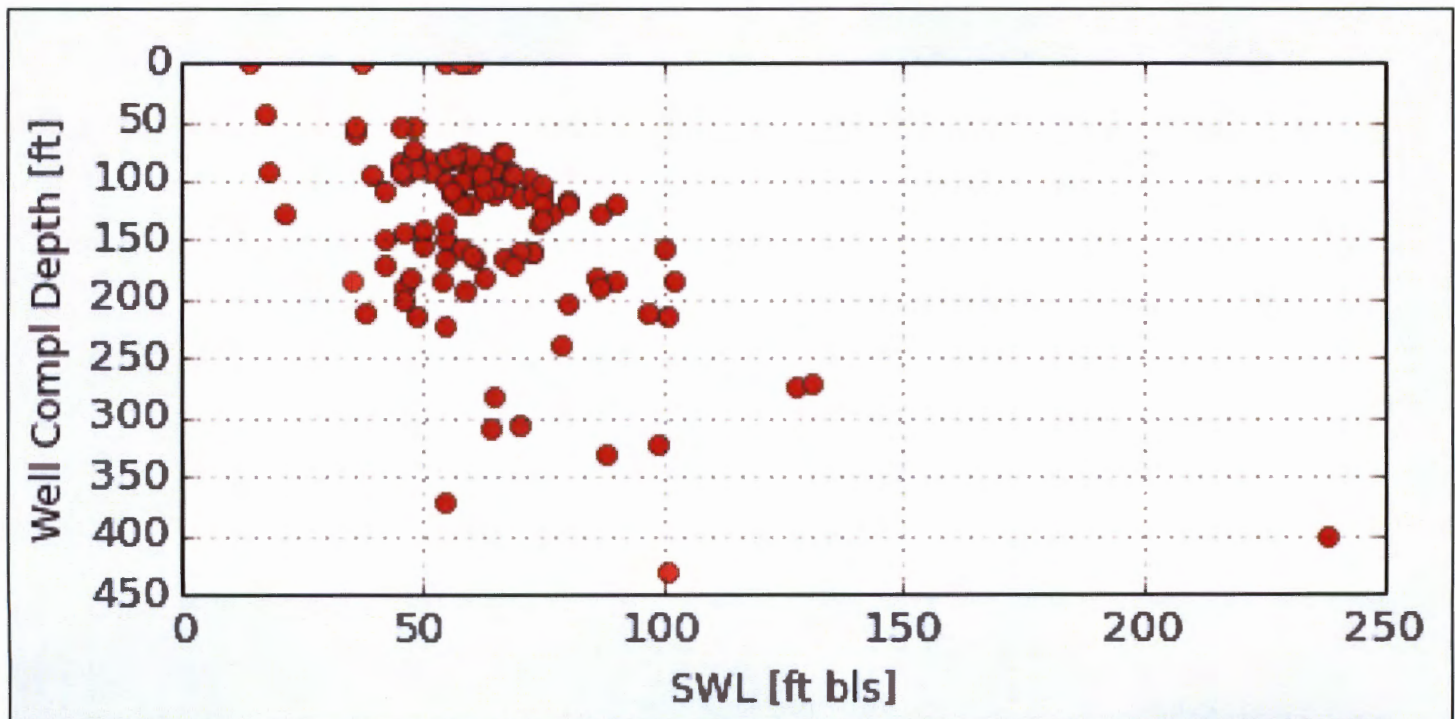
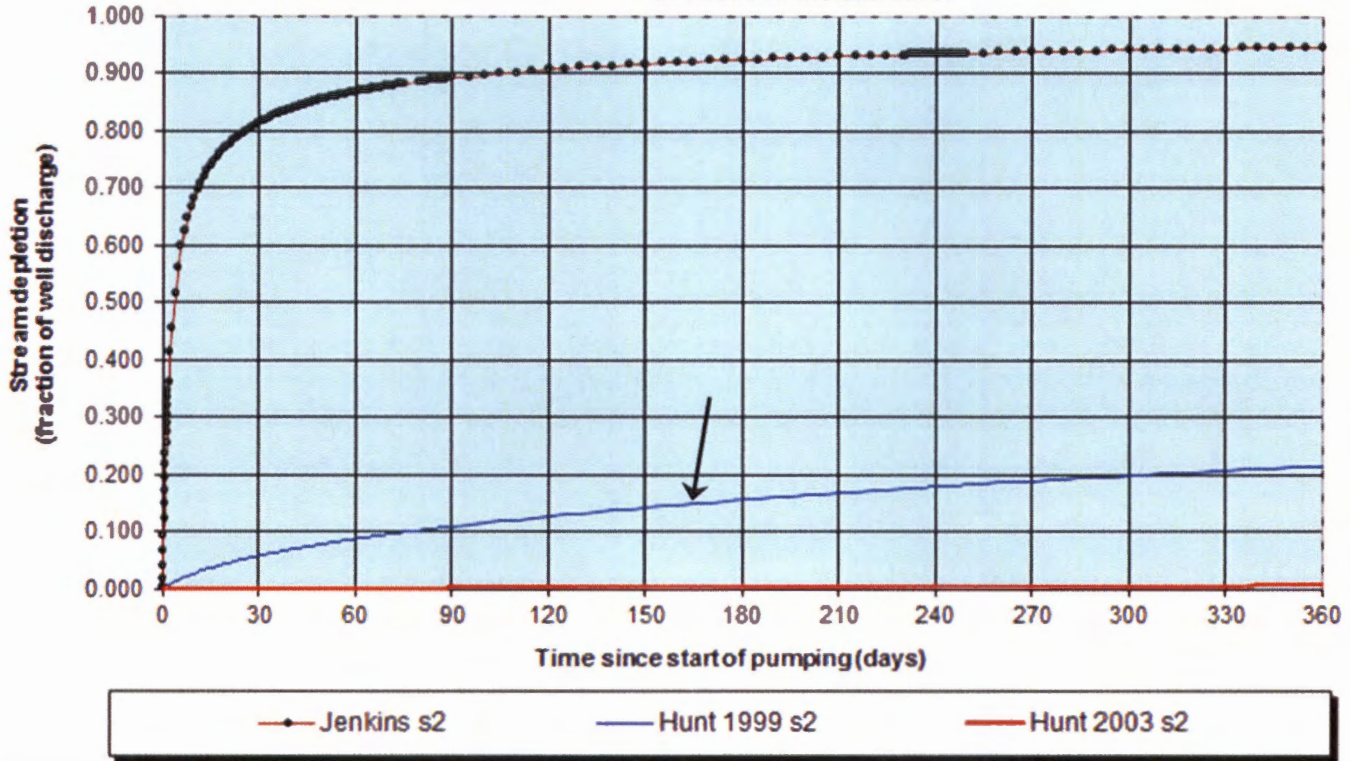


Figure 2: Well log reports from 3S/1E - S 28 & 29 show falling head elevation with completion depth, with no indication of a confined aquifer system.

Transient Stream Depletion (Jenkins, 1970; Hunt, 1999, 2003)

G-18266 to Molalla River



Output for Stream Depletion, Scenerio 2 (s2):						Time pump on (pumping duration) = 365 days						
Days	30	60	90	120	150	180	210	240	270	300	330	360
J SD	81.3%	86.7%	89.1%	90.6%	91.6%	92.3%	92.9%	93.3%	93.7%	94.0%	94.3%	94.6%
H SD 1999	5.7%	8.7%	10.9%	12.6%	14.2%	15.5%	16.7%	17.8%	18.8%	19.8%	20.6%	21.5%
H SD 2003	0.11%	0.15%	0.19%	0.23%	0.28%	0.32%	0.37%	0.42%	0.46%	0.51%	0.56%	0.60%
Qw, cfs	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450
H SD 99, cfs	0.026	0.039	0.049	0.057	0.064	0.070	0.075	0.080	0.085	0.089	0.093	0.097
H SD 03, cfs	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.003	0.003

Figure 3: Using the model of Hunt (1999), predicted fraction of groundwater from the Molalla River after 30 days is 5.7%. Aquifer transmissivity was calculated from local pump tests within the proposed aquifer system, with storativity assumed at .01, which is typical for unconfined to poorly confined systems.