Water Right Conditions Tracking Slip

Groundwater/Hydrology Section

FILE # # G17409

ROUTED TO: Jeana Eastman

TOWNSHIP/
RANGE-SECTION: 15/10W - 1 NESW

CONDITIONS ATTACHED?: [X] yes [ ] no

REMARKS OR FURTHER INSTRUCTIONS:
7F, 7P, 7T

Reviewer: Jen Woody

WATER RESOURCES DEPARTMENT

MEMO

9/23, 2010

TO: Application G- 17409

FROM: GW: J. Woody
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

_____YES
The source of appropriation is within or above a Scenic Waterway
✓ NO

_____YES
Use the Scenic Waterway condition (Condition 7J)
✓ NO

_____Per ORS 390.835, the Ground Water Section is **able** to calculate ground water interference with surface water that contributes to a Scenic Waterway. The calculated interference is distributed below.

_____Per ORS 390.835, the Ground Water Section is **unable** to calculate ground water interference with surface water that contributes to a scenic waterway; **therefore, the Department is unable to find that there is a preponderance of evidence that the proposed use will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway.**

DISTRIBUTION OF INTERFERENCE

Calculate the percentage of consumptive use by month and fill in the table below. If interference cannot be calculated, per criteria in 390.835, do not fill in the table but check the "unable" option above, thus informing Water Rights that the Department is unable to make a Preponderance of Evidence finding.

Exercise of this permit is calculated to reduce monthly flows in _____ Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: Water Rights Section Date 8/23/2010

FROM: Ground Water/Hydrology Section Jen Woody
Reviewer's Name

SUBJECT: Application G- 17409 Supersedes review of **n/a**
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 ground water 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:** Alderbrook Golf Course **County:** **Tillamook**

A1. Applicant(s) seek(s) 0.57 cfs from 3 well(s) in the **North Coast** Basin, **Vaughn Creek** subbasin Quad Map: Kilchis River

A2. Proposed use: irrigation and pond maintenance Seasonality: Mar. 1 -- Oct 31and year round, respectively

3. 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	0.57	1S/10W-1 NE SW	1535'N, 2225' E fr SW cor S 1
2	Proposed	2	alluvium	0.57	1S/10W-1 NE SW	1705'N, 2250' E fr SW cor S 1
3	Proposed	3	alluvium	0.57	1S/10W-1 NE SW	1800'N, 2275' E fr SW cor S 1
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	**65**											
2	**70**											
3	**70**											

Use data from application for proposed wells.

A4. **Comments:** These wells are not yet drilled, so well construction is unknown.

A5. ☒ **Provisions of the** North Coast Basin rules relative to the development, classification and/or management of ground water 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. GROUND WATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. **Based upon available data**, I have determined that ground water* 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 ground water 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 ground water 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 ground water resource; or

d. ☒ **will, if properly conditioned**, avoid injury to existing ground water rights or to the ground water resource:
   i. ☒ The permit should contain condition #(s) 7F, 7P, 7T ;
   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 ground water production from no deeper than _____ ft. below land surface;

b. ☐ **Condition** to allow ground water production from no shallower than _____ ft. below land surface;

c. ☒ **Condition** to allow ground water production only from the **alluvial** _____ ground water 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 Ground Water 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. **Ground water availability remarks:** The applicant's property is located in an area with up to 100 feet of alluvial terrace gravels and finer-grained sediments overlying marine sediment bedrock. Nearby well logs indicate the alluvium thins rapidly toward the uplands north and east of the proposed well field. Conversely, the alluvium thickens to the south and west. Well yields in the marine sediments are generally less than 10 gpm and not likely to provide water at rates the applicant is seeking. However, nearby alluvial wells report shallow water levels and yield 10s of gallons per minute. The applicant proposes to access the alluvial terrace deposits, at distances less than 100 feet from Vaughn Creek. The wells will have the potential to interfere with Vaughn Creek, but WAB tables indicate there is water available in the creek year-round. There is limited groundwater level data in this area. Annual high water levels are stable at the nearest alluvial observation well (TILL 621, state observation well # 790), which is about 2400 ft southeast of the proposed well field.

C. GROUND WATER/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**	☐	☒
2	**alluvium**	☐	☒
3	**alluvium**	☐	☒
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The applicant proposes to access alluvial gravels. Nearby well logs in the alluvium report 5 to 10 feet of clay overlying sand and gravel, and first water at a depth similar to static water levels. This indicates the alluvial terrace gravel aquifer is predominantly 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? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**Vaughn Creek**		**60**	**85**	☐	☐	☒	☒	☐
2	**1**	**Vaughn Creek**		**65**	**35**	☐	☐	☒	☒	☐
3	**1**	**Vaughn Creek**		**65**	**10**	☐	☐	☒	☒	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Due to the proximity of these proposed wells to Vaughn creek and the unconfined nature of the aquifer, these wells are assumed to have PSI as defined in **690-09-040 (2).** Groundwater elevation is unknown, but assumed to be close to land surface based on other wells in the area.

Water Availability Basin the well(s) are located within: Watershed ID #: 30120320 VAUGHN CR > TILLAMOOK BAY - 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**	☒	☐	**none**	**n/a**	☐	**0.23**	☒	**<25%**	☒
2	**1**	☒	☐	**none**	**n/a**	☐	**0.23**	☒	**<25%**	☒
3	**1**	☒	☐	**none**	**n/a**	☐	**0.23**	☒	**<25%**	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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?
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: Vaughn Creek stream depletion calculations using Hunt (2003) are attached. Hathaway Slough is less than 1 mile from the well field, but because there is no WAB for that drainage, depletion was not calculated. Based on distances, impacts to Hathaway Slough are expected to be much less than the effect modeled on Vaughn Creek.

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													
		%	%	%	%	%	%	%	%	%	%	%	%
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 ground water 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:

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.

Jenkins, C.T., 1970, Computation of rate and volume of stream depletion by wells: U.S. Geol. Survey Techniques of Water-Resources Investigations of the Unites States Geological Survey, Chapter D1, Book 4,17 p.

Lina Ma, Ian P. Madin, Keith V. Olson, and Rudie J. Watzig, Ray E. Wells, U.S. Geological Survey, Alan R. Niem, Oregon State University, George R. Priest, DOGAMI; additional help by Darrick E. Boschmann, Marie W. Brophy, Christina L. Furnari, Olivia L. Miller, Luke M. Raymond and Josh I. Thuele, 2009, Oregon Geospatial Data Compilation (OGDC Release- 5), Oregon Department of Geology and Mineral Industries, ArcGIS datafiles.

Schlicker, Herbet G., Deacon, Robert J., Beaulieu, John D., Olcott, Gordon W. 1972. Environmental Geology of the Coastal Region of Tillamook and Clatsop Counties, Oregon. Department of Geology and Mineral Industries Bulletin 74.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** _____ **Logid:** _____

D2. **THE WELL does not 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**:
- a. ☐ constitutes a health threat under Division 200 rules;
- b. ☐ commingles water from more than one ground water reservoir;
- c. ☐ permits the loss of artesian head;
- d. ☐ permits the de-watering of one or more ground water reservoirs;
- e. ☐ other: (specify) _____

D4. **THE WELL construction deficiency is described as follows:** _____

D5. **THE WELL**
- a. ☐ **was**, *or* ☐ **was not** constructed according to the standards in effect at the time of original construction or most recent modification.
- b. ☐ I don't know if it met standards at the time of construction.

D6. ☐ **Route to the Enforcement Section.** I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Enforcement Section and the Ground Water Section.

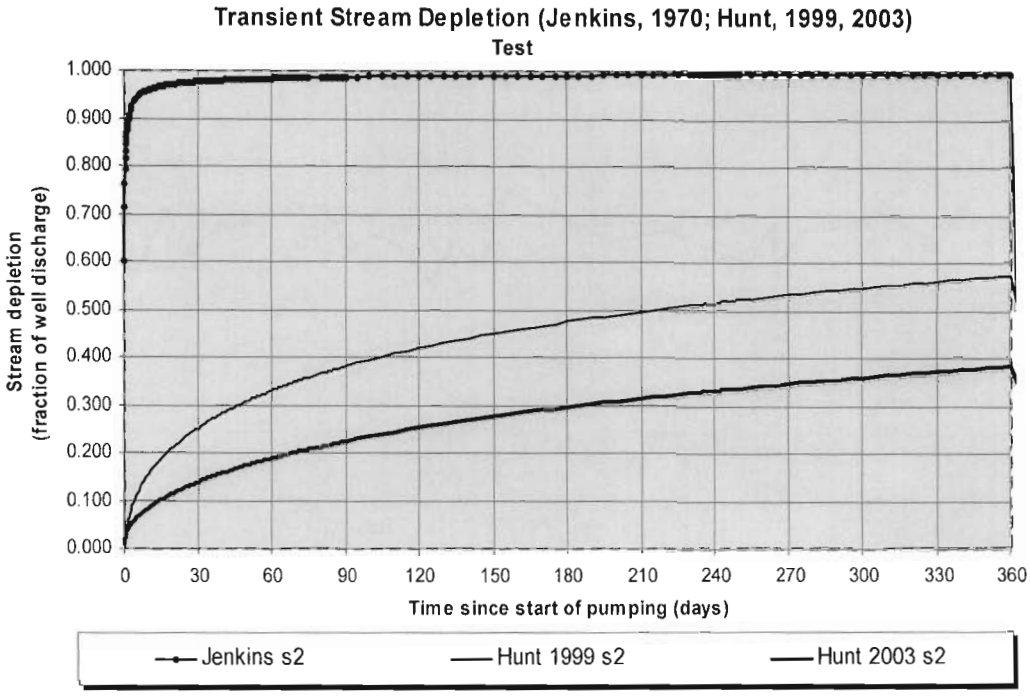
THIS SECTION TO BE COMPLETED BY ENFORCEMENT PERSONNEL

D7. ☐ Well construction deficiency has been corrected by the following actions: _____

_____ _____, 200____.
(Enforcement Section Signature)

D8. ☐ **Route to Water Rights Section (attach well reconstruction logs to this page).**

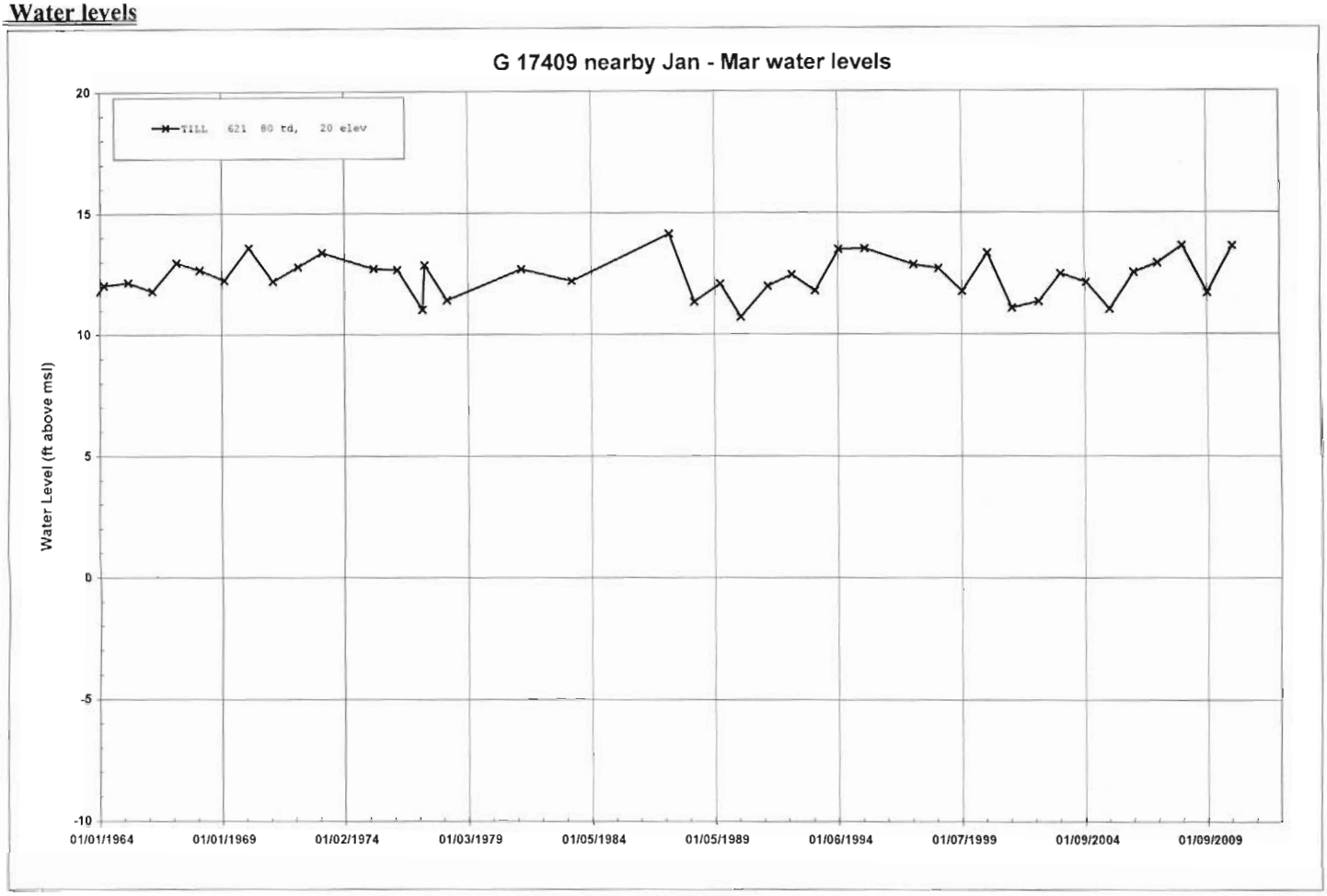
Stream depletion



Output for Stream Depletion, Scenerio 2 (s2):						Time pump on (pumping duration) = 360 days						
Days	30	60	90	120	150	180	210	240	270	300	330	360
J SD	97.6%	98.3%	98.6%	98.8%	98.9%	99.0%	99.1%	99.2%	99.2%	99.2%	99.3%	99.3%
H SD 1999	25.1%	32.9%	38.0%	41.8%	44.8%	47.4%	49.5%	51.4%	53.0%	54.5%	55.8%	57.0%
H SD 2003	13.77 %	18.77 %	22.33 %	25.15 %	27.50 %	29.53 %	31.31 %	32.90 %	34.34 %	35.64 %	36.85 %	37.98 %
Qw, cfs	0.570	0.570	0.570	0.570	0.570	0.570	0.570	0.570	0.570	0.570	0.570	0.570
H SD 99, cfs	0.143	0.187	0.216	0.238	0.256	0.270	0.282	0.293	0.302	0.311	0.318	0.325
H SD 03, cfs	0.078	0.107	0.127	0.143	0.157	0.168	0.178	0.188	0.196	0.203	0.210	0.216

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	255.80	255.80	255.80	gpm
Time pump on (pumping duration)	tpon	360	360	360	days
Perpendicular from well to stream	a	85	35	10	ft
Well depth	d	100	100	100	ft
Aquifer hydraulic conductivity	K	25	25	25	ft/day
Aquifer saturated thickness	b	90	90	90	ft
Aquifer transmissivity	T	2250	2250	2250	ft*ft/day
Aquifer storativity or specific yield	S	0.1	0.1	0.1	
Aquitard vertical hydraulic conductivity	Kva	0.8	0.8	0.8	ft/day
Aquitard saturated thickness	ba	10	10	10	ft
Aquitard thickness below stream	babs	5	5	5	ft
Aquitard porosity	n	0.3	0.3	0.3	
Stream width	ws	10	10	10	ft
Streambed conductance (lambda)	sbc	1.600000	1.600000	1.600000	ft/day
Stream depletion factor	sdf	0.321111	0.054444	0.004444	days
Streambed factor	sbf	0.060444	0.024889	0.007111	
input #1 for Hunt's Q_4 function	t'	3.114187	18.367347	225.000000	
input #2 for Hunt's Q_4 function	K'	0.256889	0.043556	0.003556	
input #3 for Hunt's Q_4 function	epsilon'	0.333333	0.333333	0.333333	
input #4 for Hunt's Q_4 function	lamda'	0.060444	0.024889	0.007111	

Water levels



Water Availability

VAUGHN CR > TILLAMOOK BAY - AT MOUTH
NORTH COAST BASIN

Water Availability as of 8/19/2010

Watershed ID #: 30120320 Exceedance Level: 80%

Date: 8/19/2010 Time: 8:32 AM

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

Water Availability Calculation

Monthly Streamflows in Cubic Feet per Second
Storage 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	2.75	0.00	2.75	0.00	0.00	2.75
FEB	3.61	0.00	3.61	0.00	0.00	3.61
MAR	2.54	0.00	2.54	0.00	0.00	2.54
APR	1.43	0.00	1.43	0.00	0.00	1.43
MAY	0.75	0.00	0.75	0.00	0.00	0.75
JUN	0.51	0.01	0.50	0.00	0.00	0.50
JUL	0.33	0.02	0.31	0.00	0.00	0.31
AUG	0.23	0.01	0.22	0.00	0.00	0.22
SEP	0.30	0.00	0.30	0.00	0.00	0.30
OCT	0.34	0.00	0.34	0.00	0.00	0.34
NOV	1.31	0.00	1.31	0.00	0.00	1.31
DEC	2.81	0.00	2.81	0.00	0.00	2.81
STO	1,990.00	2.44	1,990.00	0.00	0.00	1,990.00

Well Locations