Groundwater Review Summary Form

Application # G- 18388

GW Reviewer Thomas **Date Review Completed:** 12-29-16

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).

WATER RESOURCES DEPARTMENT

MEMO 12-29 ,20 16

TO: **Application G-** 18388

FROM: **GW:** Thomas
(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 Groundwater 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 Groundwater 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 GROUNDWATER APPLICATIONS

TO: Water Rights Section Date December 29, 2016

FROM: Groundwater Section Michael Thoma
Reviewer's Name

SUBJECT: Application G- 18388 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: **Thor Thompson** County: **Jackson**

A1. Applicant(s) seek(s) 0.2 cfs from 6 well(s) in the Rogue Basin, Upper Rogue subbasin

A2. Proposed use Nursery Seasonality: 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	JACK 54961	1	Bedrock	0.2	36S/01E-06 SWSW	**83'N, 1346' W of SE cor S 6**
2	Proposed	2	Bedrock	0.2	36S/01E-06 NWSE	**1507'N, 2418' W of SE cor S 6**
3	Proposed	3	Bedrock	0.2	36S/01E-06 NWSE	**1526'N, 2375' W of SE cor S 6**
4	JACK 19406	5	Bedrock	0.2	36S/01E-06 NESE	**1610'N, 4420' W of SE cor S 6**
5	JACK 19404	6	Bedrock	0.2	36S/01E-06 SWNE	**3275'N, 2116' W of SE cor S 6**
6	Proposed	7	Bedrock	0.2	36S/01E-06 NENE	**4120'N, 1063' W of SE cor S 6**

* 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	1670	250	202	09-15-01	400	0-25	+1-25	0-400	240-400	3.5		A
2	1570	*	*		400*							
3	1570	*	*		400*							
4	1480	25	+1	9-9-77	264	0-19	0-20	-	-	3.5		A
5	1480	68	52	6-19-79	225	0-19	0-41	-	-	1.5		A
6	1410	*	*		400*							

Use data from application for proposed wells.

A4. **Comments:** *Wells # 2, 3, and 6 are proposed with a depth of 400 ft; *First Water* and *SWL* cannot be estimated from nearby well logs because of the high relief of the area and elevation differences between proposed and existing wells.

A5. ☒ **Provisions of the** Rogue (OAR 690-515) 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)
7J (Scenic Waterway);
7E (Reference Level – from all wells);
7N (Annual SWL – from Well #4 only (JACK 19406);
Medium 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:** There are no OWRD Observation Well data in the area of the proposed POA so groundwater over-appropriation cannot be determined. There is only one permitted groundwater POA (Permit G-15338) in the same Section as the proposed POAs and it is located on the same taxlot and is likely using the same POA as Well #4 on this review (JACK 19406; applicant's well # 5). Therefore, injury to this existing groundwater rights was not considered in this review.

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	**Bedrock of E. Western Cascades**	☒	☐
2	**Bedrock of E. Western Cascades**	☒	☐
3	**Bedrock of E. Western Cascades**	☒	☐
4	**Bedrock of E. Western Cascades**	☒	☐
5	**Bedrock of E. Western Cascades**	☒	☐
6	**Bedrock of E. Western Cascades**	☒	☐
		☐	☐

Basis for aquifer confinement evaluation: wells logs for the applicant's existing wells report *SWL* above *First Water*, implying confined aquifer conditions; confined conditions are likely dominant in the layered volcaniclastic sediments and flows of the E. Western Cascades aquifer system

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	**Qtr. Branch Antelope Cr**	**1470**	**< 1360**	**9100†**	☒	☐	☐	☐	☐
2	1	**Qtr. Branch Antelope Cr**	**1520***	**< 1360**	**9000†**	☒	☐	☐	☐	☐
3	1	**Qtr. Branch Antelope Cr**	**1520***	**< 1360**	**9000†**	☒	☐	☐	☐	☐
4	2	**Little Butte Cr**	**1480**	**1360-1400**	**3620**	☒	☐	☐	☐	☐
5	2	**Little Butte Cr**	**1430**	**1360-1400**	**2230**	☒	☐	☐	☐	☐
6	2	**Little Butte Cr**	**1360***	**1360-1400**	**1520**	☒	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: GW elevations are estimated to be above SW elevations suggesting groundwater is flowing towards and discharging to surface water

*For the proposed wells, *GW Elev* was estimated at 50 ft BLS

†Distances to Qtr. Branch Antelope Cr are to just above the farthest upstream surface water POD

Water Availability Basin the well(s) are located within:
Wells #1, #2, #3: Antelope Cr > Little Butte Cr – At Mouth (ID# 248)
Wells #4, #5, #6: Little Butte Cr > Rogue R – At Mouth (ID# 263)

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?
4	2	☐	☐	**MF262A**	**20**	☐	**23.3**	☐	**	☐
5	2	☐	☐	**MF262A**	**20**	☐	**23.3**	☐	**	☐
6	2	☐	☐	**MF262A**	**20**	☐	**23.3**	☐	**	☐

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: **Interference @ 30 d could not be estimated because the terrain (high-relief slopes) and geology (fractured bedrock aquifer) do not meet model assumptions of the widely accepted techniques for determining stream depletion (e.g., Hunt 1999, 2003).

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
1,2,3	**1**	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS		**See Comments Below****											

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: _____

**Interference @ 30 d could not be estimated because the terrain (high-relief slopes) and geology (fractured bedrock aquifer) do not meet model assumptions of the widely accepted techniques for determining stream depletion (e.g., Hunt 1999, 2003).

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 POAs would be producing from an aquifer that has been found to be hydraulically connected to surface water sources: Wells #1, #2, and #3 at distances of > 1 mile and Wells #4, #5, and #6 at distances of between ¼ mile and 1 mile. The proposed rate is less than 1% of the both the 80%-exceedance natural flows and the instream rights for the proposed POAs hydraulically connected at < 1 mile distance and interference cannot be calculated for the proposed POAs hydraulically connected at > 1 mile distance so the reviewer is unable to find a preponderance of evidence that the proposed use will have the Potential for Substantial Interference (PSI) with surface water.

References Used:

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

Hunt, B. 2003. *Unsteady Stream Depletion when Pumping from a Semiconfined Aquifer.* Journal of Hydrologic Engineering. Vol 8(1), pp 12-19

Oregon Department of Geology and Mineral Industries, *Geologic Map of Oregon*. http://www.oregongeology.org/geologicmap/

OWRD Well Log Database – Accessed 12/29/2016.

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

Water Availability Analysis
Detailed Reports

ANTELOPE CR > LITTLE BUTTE CR - AT MOUTH
ROGUE BASIN

Water Availability as of 12/29/2016

Watershed ID #: 248 (Map) Exceedance Level: 80%
Date: 12/29/2016 Time: 4:33 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	17.50	4.92	12.60	0.00	25.00	-12.40
FEB	29.00	6.18	22.80	0.00	25.00	-2.18
MAR	31.70	5.92	25.80	0.00	25.00	0.78
APR	34.70	0.66	34.00	0.00	25.00	9.05
MAY	11.70	1.36	10.30	0.00	10.00	0.34
JUN	6.62	2.11	4.51	0.00	5.00	-0.49
JUL	5.74	3.00	2.74	0.00	5.00	-2.26
AUG	5.92	2.44	3.48	0.00	5.00	-1.52
SEP	3.31	1.54	1.77	0.00	20.00	-18.20
OCT	1.06	0.23	0.83	0.00	20.00	-19.20
NOV	2.21	0.50	1.71	0.00	25.00	-23.30
DEC	5.47	3.08	2.39	0.00	25.00	-22.60
ANN	19,100.00	1,920.00	17,100.00	0.00	12,900.00	8,040.00

Water Availability Analysis
Detailed Reports

LITTLE BUTTE CR > ROGUE R - AT MOUTH
ROGUE BASIN

Water Availability as of 12/29/2016

Watershed ID #: 263 (Map) Exceedance Level: 80%
Date: 12/29/2016 Time: 4:34 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	133.00	44.20	88.80	0.00	100.00	-11.20
FEB	206.00	55.30	151.00	0.00	100.00	50.70
MAR	236.00	58.90	177.00	0.00	100.00	77.10
APR	297.00	17.80	279.00	0.00	100.00	179.00
MAY	141.00	30.90	110.00	0.00	60.00	50.10
JUN	82.50	48.90	33.60	0.00	20.00	13.60
JUL	73.90	69.80	4.05	0.00	20.00	-15.90
AUG	70.70	56.70	14.00	0.00	20.00	-6.03
SEP	45.90	35.40	10.50	0.00	120.00	-109.00
OCT	23.30	12.00	11.30	0.00	120.00	-109.00
NOV	34.40	22.10	12.30	0.00	100.00	-87.70
DEC	60.80	37.90	22.90	0.00	100.00	-77.10
ANN	153,000.00	29,600.00	123,000.00	0.00	57,800.00	82,800.00

Well Location Map