

Groundwater Review Summary Form

Application # G- 18377

GW Reviewer Aurora Bouchier Date Review Completed: Feb. 2, 2017

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).

MEMO

Feb. 2, 2017

FROM: GW: Aurora Bouchier
(Reviewer's Name)

☐ YES☒ NO☐ YES☒ NO

☐ 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.**

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.

[illegible]

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date February 2, 2017
 FROM: Groundwater Section Aurora C Bouchier
 SUBJECT: Application G- 18377 Supersedes review of na
 Reviewer's Name
 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: William, Douglas, & Thomson Martin County: Sherman

A1. Applicant(s) seek(s) 7.0 cfs from 4 well(s) in the Deschutes Basin,
Middle Columbia-Hood subbasin (Biggs Junction and Sher quadrangles)

A2. Proposed use Primary Irrigation (84.4 acres), Supplemental Irrigation (880.03 acres)
 Seasonality: March 1 – October 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	proposed	1	CRB	7.0	2N/16E-11 NE-NW	65' S, 1725' E fr NW cor S 11
2	proposed	2	CRB	7.0	2N/16E-02 SE-SE	145' N, 315' W fr SE cor S 2
3	proposed	3	CRB	7.0	2N/17E-07 SW-NW	35' N, 1040' E fr W1/4 cor S 7
4	proposed	4	CRB	7.0	2N/17E-06 SE-SW	715' N, 155' W fr S1/4 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	~460	na	na	na	>550 to 600	na	na	na	na	Up to 3141.6	na	na
2	~815				Same					Same		
3	~945				Same					Same		
4	~880				Same					Same		

Use data from application for proposed wells.

A4. **Comments:** The applicants intend to construct the proposed wells deeper than their existing wells to avoid appropriating the water-bearing zones they use. The applicants' hope to obtain an amount of water (7.0 cfs), and they propose constructing up to 4 wells to obtain that amount. The applicants' realize that there is a possibility they might not find water to reach their goal.

A5. ☒ **Provisions of the** Deschutes 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 outside of the USGS Groundwater Study Area, and therefore are not subject to Division 690-505-0500 to -0620.

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. (Assuming the wells are constructed as spelled out in section B3.) * 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 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:
- ☐ The permit should contain condition #(s) 7N – Annual WL (March), 7T – Measuring Tube, Large measuring and reporting with flow meter on each well;
 - ☐ The permit should be conditioned as indicated in item 2 below.
 - ☐ 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:**

With regard to B1b: In order to reduce potential to cause injury to prior water rights, the wells will likely need to be constructed into water-bearing zones at or below the depths that nearby water rights are producing from. Within a mile of the proposed well locations there are 3 certified rights on springs emerging at elevations of approximately 225, 280, and 610 feet above sea level; the proposed well must produce from water-bearing zones below these springs. The City of Rufus municipal well (SHER 50113) primarily produces from a zone approximately -68 to -92 feet in elevation. SHER 50113 has a static water level of approximately 162 feet in elevation – essentially the same as the elevation of the Columbia River at Lake Celilo. It appears the water-bearing zone which SHER 50113 produces from is in hydraulic connection with the river. If the proposed wells produce from the same water-bearing zone as SHER 50113 they will likely be in hydraulic connection with the river although it is unlikely they would injure the existing groundwater users which are likewise in hydraulic connection with the river.

Based on the best available information, at the proposed location well 1 will likely need to be approximately 550 feet (minimum) in total depth, well 2 will likely need to be approximately 900 feet (minimum) in total depth, well 3 will likely need to be approximately 1040 feet (minimum) in total depth, and well 4 will likely need to be approximately 970 feet (minimum) in total depth.

Groundwater production in each well shall be limited to a single aquifer in the Columbia River Basalt Group. Each well shall be continuously cased and continuously sealed to within 100 feet of the bottom of the open borehole. A larger open interval may be approved by the Department if the permittee can demonstrate to the Departments' satisfaction, using packer tests or other suitable methods, that the hydraulic heads of water-bearing zones in the

proposed open interval are equivalent or that the open interval is part of a continuous zone of interconnected porous materials. Following well completion, the wells shall be thoroughly developed to remove cuttings and drilling fluids. A video log of each well shall be collected to demonstrate to the satisfaction of the Department that each well is only open to a single aquifer.

Each well with a pump shall be equipped with a dedicated 3/4-inch diameter (minimum) water-level measurement tube, separate from other methods of measuring the water levels such as airlines or transducers. The annual water-level measurement required in the permit shall be measured through the measuring tube.

Drill cuttings shall be collected at the permitted wells and any test holes. Samples shall be collected at ten-foot intervals and at changes in lithology and shall be submitted to OWRD.

All hydrologic, geologic, geochemical and video data collected shall be provided to OWRD in report and in electronic form specified by the Department.

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	CRBG	☒	☐
2	CRBG	☒	☐
3	CRBG	☒	☐
4	CRBG	☒	☐

Basis for aquifer confinement evaluation: Deep wells in the CRBG typically develop water from confined aquifers.

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	Columbia River – Lake Celilo	?	160	1,770	☒	☐	☐	☐	☒
2	1	“ ”	?	160	3,000	☒	☐	☐	☐	☒
3	1	“ ”	?	160	8,200	☒	☐	☐	☐	☒
4	1	“ ”	?	160	5,450	☒	☐	☐	☐	☒
1	2	Spring on Cert 54473	?	280	330	☐	☒	☐	☐	☒
2	2	“ ”	?	280	3,390	☐	☒	☐	☐	☒
3	3	Spring on Cert 37766	?	610	5,040	☐	☒	☐	☐	☒
4	3	“ ”	?	610	2,770	☐	☒	☐	☐	☒
2	4	Spring on Cert 63753	?	225	5,345	☐	☒	☐	☐	☒
3	4	“ ”	?	225	6,220	☐	☒	☐	☐	☒
4	4	“ ”	?	225	4,825	☐	☒	☐	☐	☒

Basis for aquifer hydraulic connection evaluation:

Within a mile of the proposed well locations there are 3 certified rights on springs emerging at elevations of approximately 225, 280, and 610 feet above sea level; the proposed well must produce from water-bearing zones below these springs. The City of Rufus municipal well (SHER 50113) primarily produces from a zone approximately -68 to -92 feet in elevation. SHER 50113 has a static water level of approximately 162 feet in elevation – essentially the same as the elevation of the Columbia River at Lake Celilo. It appears the water-bearing zone which SHER 50113 produces from is in hydraulic connection with the river. **If the proposed wells produce from the same water-bearing zone as SHER 50113 they will likely be in hydraulic connection with the river. However, this should prevent the proposed wells from being hydraulically connected to the nearby springs with certified water rights.**

Water Availability Basin the well(s) are located within: Not within a WAB, area contributes directly to Columbia River.

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 & 2	1	☐	☐	na	na	☐	na	☐	See below	☐

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: If the wells are completed such that they produce from the same water-bearing zone as SHER 50113, they will likely be in hydraulic connection with the river. However, this should prevent the proposed wells from being hydraulically connected to the nearby springs with certified water rights. There is no specified natural flow for the Columbia River. There is no model that is currently available that can appropriately estimate stream depletion impacts for wells that produce from a stratiform basalt aquifer.

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
3 & 4	1	%	%	%	%	%	%	%	%	%	%	%	%
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:

If the wells are completed such that they produce from the same water-bearing zone as SHER 50113, they will likely be in hydraulic connection with the river. However, this should prevent the proposed wells from being hydraulically connected to the nearby springs with certified water rights. There is no specified natural flow for the Columbia River. There is no model that is currently available that can appropriately estimate stream depletion impacts for wells that produce from a stratiform basalt aquifer.

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: _____

Application folder: G-18377, and referenced G-17506.

Rufus quadrangle and Biggs Junction quadrangle topographic maps.

OWRD well log and water level database, in particular SHER 50113.

Swanson, D. A., Anderson, J. L., Camp, V. E., Hooper, P. R., Taubeneck W. H., and Wright, T. L., 1981, Reconnaissance geologic map of the Columbia River Basalt Group, Northern Oregon and Western Idaho: Reston, Va., U.S. Geological Survey, Open File Report.

D. WELL CONSTRUCTION, OAR 690-200

D1. Well #: _____ Logid: _____

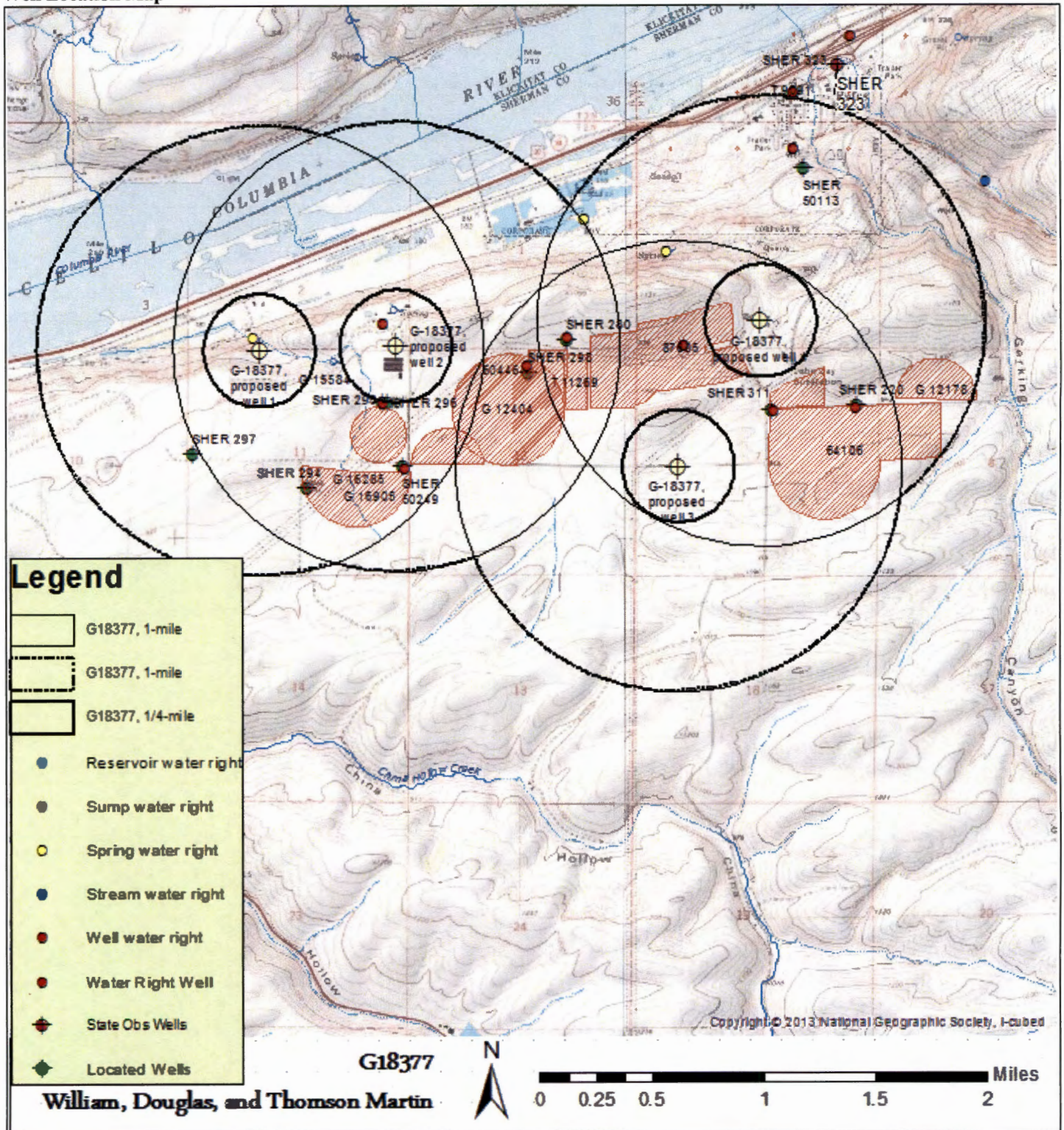
D2. **THE WELL does not appear to meet current well construction standards based upon:**

- 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

Well Location Map



Water-Level Trends in Nearby Wells

