

# Groundwater Application Review Summary Form

Application # G- 18471

GW Reviewer Aaron Bouchier Date Review Completed: 5/30/2017

## 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).*

Not actually requesting additional water. Only asking for additional acres.



PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date May 30, 2017  
 FROM: Groundwater Section Aurora C Bouchier  
 Reviewer's Name  
 SUBJECT: Application G- 18479 Supersedes review of na  
 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: WPBC1, LLC / attn. Ken Johnston County: Marion

A1. Applicant(s) seek(s) 0.134 cfs from 1 well(s) in the Willamette Basin,  
Middle Willamette subbasin (Sidney quadrangle)

A2. Proposed use irrigation (36.66 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	MARI 18140	1	CRB	0.134	8S/3W-25 SE-NW	620' S, 1230' W fr C-N 1/16 Cor S 25
2						

\* 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	625	174	156	9/30/1992	303	0-108	+1-108	0-300	180-200, 240-300	20	59	A

Use data from application for proposed wells.

A4. **Comments:** The well (MARI 18140) is the authorized well Certificate 76257 for 35 gpm (0.08 cfs), and the extension permits G-17738 and G-17739 (under applications G-15071 and G-15037 respectively) which both expire on October 1, 2020 and have a cumulative diversion of not more than 0.134 cfs. This application states that "the proposed maximum rate of use requested under this application will be limited to a combined cumulative diversion with the water rights issued under permits [G-17738 and G-17739]... of not more than 0.134 cfs." **In effect, this application proposes stretching an already approved amount of water to an additional 36.66 acres using drip irrigation.** The place of use (POU) for this application is a cleared field to the north of the related permits.

A5.  **Provisions of the** Willamette 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 well is producing from a confined basalt aquifer. The pertinent rules (OAR 690-502-0240) apply to unconfined alluvium, so it appears they are not activated by this application.

A6.  **Well(s) #** 1, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, tap(s) an aquifer limited by an administrative restriction. Name of administrative area: South Salem Hills Groundwater Limited Area

Comments: According to OAR 690-502-0200, Groundwater in the basalt aquifers in the South Salem Hills Groundwater Limited Area is classified for exempt uses, irrigation, and rural residential fire protection systems only. Permits may be issued, for a period not to exceed five years, for fire protection and for drip or equally efficient irrigation. The amount of water used for irrigation shall be further limited to one acre-foot per acre per year. Permits may be extended for additional five-year periods if the Director of the Water Resources Department finds that the groundwater resource can probably support the extended use.

**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) 7I, Large Water User;
  - 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:** \_\_\_\_\_

**Special Conditions:**

1. As per the Willamette Basin Special Columbia River Basalt Group Aquifer Permit Conditions (OAR 690-502-0250 (1)), a static water-level measurement [shall] be made and submitted to OWRD before use of water may commence at the well, [OWRD Groundwater Section staff can collect this measurement once a dedicated measurement tube is installed];
2. As per the Willamette Basin Special Columbia River Basalt Group Aquifer Permit Conditions (OAR 690-502-0250(5)), the Department shall determine... the initial and subsequent [reference] water levels from which...[groundwater] declines are referenced. The issuance of the related permits G-17738 and G-17739 was predicated upon a “good” SWL measurement rather than a failing airline. In March 2016 a measurement was made using an etape which resulted in extensions being granted. The reference water level for this application (if it is permitted) shall be the same reference water-level as for the related permits G-17738 and G-17739;
3. The permit shall expire on 10/31/2021, consistent with other time-limited permits recently renewed in the South Salem Hills Groundwater Limited Area.

**Remarks:**

The applicant’s well produces from one or more water-bearing zones in the Columbia River Basalt Group (CRBG), a series of lava flows with a composite thickness that ranges from 200 to 300 feet in this area (Conlon et al., 2005). Each flow is characterized by a series of internal features, including a thin rubble zone at the contact between flows and a thick, dense, low porosity and low permeability interior zone. In some cases, sedimentary layers were deposited during the time between basalt flow emplacements. A flow top, sedimentary interbed and flow bottom are collectively referred to as an interflow zone. Unconfined groundwater occurs near the weathered top of the basalts, but most water occurs in interflow zones at the contacts between lava flows. CRBG flow features result in a series of stacked, thin aquifers that are confined by dense flow interiors. The low permeability of the basalt flow interiors usually results in little connection between stacked aquifers, which generally results in tabular aquifers with unique water level heads (Reidel et al., 2002).

Vertical offset is mapped along the north-south- trending normal fault mapped in the vicinity of this well. The faults juxtapose the Winter Water Unit of the Grande Ronde Basalt Formation against the Sentinel Bluffs Unit of the Grande Ronde Basalt Formation (Tolan and Beeson, 2000b). Vertical offset of CRBG flows can cause juxtaposition of permeable interflows with dense flow interiors, resulting in a low flow boundary at the fault trace. At the subject site, the degree of compartmentalization by faulting is unknown. Compartmentalization could buffer or delay well-to-well impacts, while also limiting the aquifer extent. The CRBG overlies Tertiary marine sediments, which are typically low-permeability, fractured and consolidated rocks. The unconformity between the marine sediments and the basalts locally limits the thickness and extent of individual CRBG aquifers.

Limited groundwater elevations in the area make it difficult to long-term trends, although elsewhere in the South Salem Hills the relatively stable water levels show no significant losses in head within the CRBG aquifers at the current level of use. However, the universally low storativity of CRBG aquifers limit their potential productivity, both in rate and total volume.

Generally, pumping drawdown effects can be detected at distances of a mile or greater within minutes of turning on a pump in a CRBG aquifer. For these reasons, the potential for the proposed use to interfere with senior groundwater rights, both permitted and exempt, is significant. Additionally, there is uncertainty that the resource can sustain the proposed use.

**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	CRB	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer confinement evaluation:** Based on the well log for the applicant's well (MARI 18140) the driller encountered water from 174 to 280 feet, with a static water level of 156 feet.

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	Battle Creek	~470	370	1610	<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"/>

**Basis for aquifer hydraulic connection evaluation:** In the South Salem Hills area the basalt layers are gently dipping to the northeast (Foxworthy, 1970), and have been heavily faulted (Tolan and Beeson, 2000a and Tolan and Beeson, 2000b). Based on the dip, the mapped faults, and the stream locations, it appears that the well may be hydraulically connected to Battle Creek.

**Water Availability Basin the well(s) are located within:** The well is located within WAB 183 [WILLAMETTE R> COLUMBIA R-AB MILL CR AT GAGE 1419100].

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?
		<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"/>

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

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 files: G-18479, and extensions for related limited license application files G-15037 and G-15071.

Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005, Ground-water hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

Foxworthy, Bruce I., 1970, Hydrologic Conditions and Artificial Recharge Through a Well in the Salem Heights Area of Salem, Oregon: U.S. Geological Survey Water-Supply Paper 1594-F.

Gannett, M.W. and Caldwell, R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A, 32p.

Reidel, S.P., Johnson, V.G., and Spane, F.A., 2002, Natural gas storage in basalt aquifers of the Columbia Basin, Pacific Northwest USA—A guide to site characterization: Richland, Wash., Pacific Northwest National Laboratory, 277 p.

Tolan, Terry L., and Beeson, Marvin H., 2000a, Geologic Map and Database of the Salem East and Turner 7.5 Minute Quadrangles, Marion County, Oregon: A Digital Database; U.S. Geological Survey Open-File Report 00-351 Sheet 1 of 2 and 2 of 2.

Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82p.

Yeats, R.S., Graven, E.P., Werner, K.S., Goldfinger, C., Popowski, T.A., 1996, Geologic map of the central and southern Willamette Valley, Benton, Lane, Linn, Marion and Polk counties, Oregon: U.S. Geological Survey, Reston, VA., Professional Paper PP-15



**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) \_\_\_\_\_

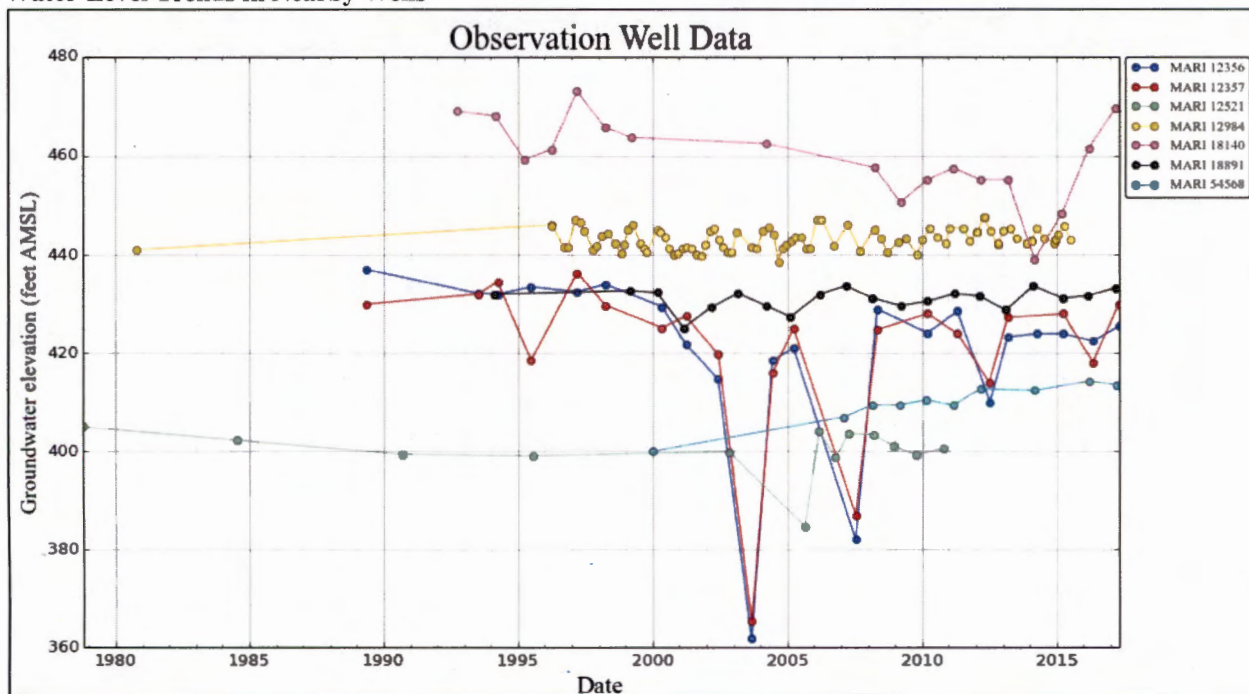
D3. THE WELL construction deficiency or other comment is described as follows: \_\_\_\_\_

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 #: 30200701 Time: 2:22 PM		MILL CR > WILLAMETTE R - AT MOUTH Basin: WILLAMETTE			Exceedance Level: 80 Date: 05/30/2017	
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	236.00	69.80	166.00	0.00	0.00	166.00
FEB	224.00	67.70	156.00	0.00	0.00	156.00
MAR	206.00	67.60	138.00	0.00	0.00	138.00
APR	155.00	67.40	87.60	0.00	0.00	87.60
MAY	78.30	67.80	10.50	0.00	0.00	10.50
JUN	40.70	66.10	-25.40	0.00	0.00	-25.40
JUL	20.60	64.80	-44.20	0.00	0.00	-44.20
AUG	16.30	70.00	-53.70	0.00	0.00	-53.70
SEP	17.20	69.00	-51.80	0.00	0.00	-51.80
OCT	20.30	66.90	-46.60	0.00	0.00	-46.60
NOV	59.30	67.00	-7.69	0.00	0.00	-7.69
DEC	167.00	68.90	98.10	0.00	0.00	98.10
ANN	135,000	49,100	96,300	0	0	96,300

**Water-Level Trends in Nearby Wells**



Well Location Map

