Groundwater Application Review Summary Form

Application # G- 18513

GW Reviewer Phil Marcy **Date Review Completed:** 11/21/2017

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).

WATER RESOURCES DEPARTMENT

MEMO Nov. 21, 2017

TO: **Application G-** 18513

FROM: **GW:** Phil Marcy
(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 11/21/2017

FROM: Groundwater Section Phillip I. Marcy
Reviewer's Name

SUBJECT: Application G- 18513 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: **Timothy and Jennifer Banister** County: **Baker**

A1. Applicant(s) seek(s) 0.4* cfs from 1 well(s) in the Powder Basin, subbasin

A2. Proposed use Irrigation (23.8 acres) Seasonality: March 1st – October 31st (245 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	Tuffaceous Sedimentary Rocks or Basalt	0.4	8S/42E-19 NW-NW	1110'S, 330'E fr NW cor S 19

* 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	2848	NA	NA	NA	300+	TBD	TBD	TBD	TBD	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** *Rate requested is 1/60 cfs/acre, which the applicant states is needed to mitigate the effects of high evaporation rates in the Keating Valley. Nearby right G-17287 is permitted to irrigate at a similar volume per acre.

A5. ☒ **Provisions of the** Powder 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; "Large 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 **Tuffaceous Sedimentary** groundwater reservoir between approximately **200** ft. and **400** 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:** Very little groundwater data is available for this area, therefore future development should be approached with caution. Nearby POA well BAKE 52348 (permit G-17287) is constructed to produce from the volcanic aquifer system, and displays declining groundwater elevations (see attached hydrograph) during the past two years. If additional production is allocated from this aquifer it is likely to speed the decline and possibly lead to interference with the neighboring senior right. Therefore, any permit resulting from this application must be conditioned to exclude the development of the deep volcanic aquifer (section B2c above). The remainder of this review shall only consider the impacts of groundwater production from the sedimentary aquifer.

In order to gain a better understanding of the sustainability of the overlying sedimentary aquifer system, condition 7N is recommended, requiring annual measurements in the month of March, before use of irrigation water begins.

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	**Sedimentary Rocks**	☒	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The applicant states a preference to develop from "Tuffaceous Sedimentary Rocks", as mapped by Brooks (1976). Nearby driller's logs report static water level elevations rising significantly above the water-bearing zones that produce them. The sedimentary aquifer, at depth, is somewhat confined by significant horizons of fine-grained, low permeability sediments that overlie the water-bearing zones in this area. However, these fine-grained stratum may not be laterally continuous over large areas, and therefore may provide only localized confinement.

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
1A	**1**	**Powder River**	**2772**	**2696**	**6300**	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: The degree of hydraulic connection is likely inefficient, with resultant impacts to surface waters being delayed and diffuse due to thick successions of fine-grained material above the proposed water-bearing zones.

Water Availability Basin the well(s) are located within: Powder River > Snake River – Above Goose Creek (#72192)

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?
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: This section does not apply.

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	**1**	**.02 %**	**.02 %**	**0.0 %**	**0.0 %**	**0.0 %**	**0.0 %**	**0.0 %**	**.01 %**	**.01 %**	**.01 %**	**.01 %**	**.02 %**
Well Q as CFS		**0.0**	**0.0**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.0**	**0.0**
Interference CFS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

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.	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
(B) = 80 % Nat. Q	**76.2**	**128**	**254**	**580**	**800**	**620**	**210**	**110**	**75.7**	**73.6**	**80.2**	**85.8**
(C) = 1 % Nat. Q	**0.76**	**1.28**	**2.54**	**5.80**	**8.00**	**6.20**	**2.10**	**1.10**	**.757**	**.736**	**.802**	**.858**
(D) = (A) > (C)												
(E) = (A / B) x 100	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**	**0 %**

(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: The analytical model of Hunt (2003) was utilized to assess expected impacts to the Powder River as a result of pumping at the proposed rate and location. Due to the distance to surface water and the existence of fine-grained lithologies above the proposed production zone, impacts are expected to be minimal within the first year of pumping.

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:** At the proposed location, it is unlikely that the proposed POA well will encounter extensive sequences of highly productive sediments, with most nearby logs reporting multiple sand and gravel deposits of less than 20' in thickness.

References Used:

Application file: G-18321, and nearby G-16080 and G-16090

Brooks, H.C., 1979, Geologic map of Huntington and part of Olds Ferry quadrangles, Oregon, Geologic Map Series GMS-13, Oregon Department of Geology and Mineral Industries, Portland, OR., map scale 1:62,500.

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

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

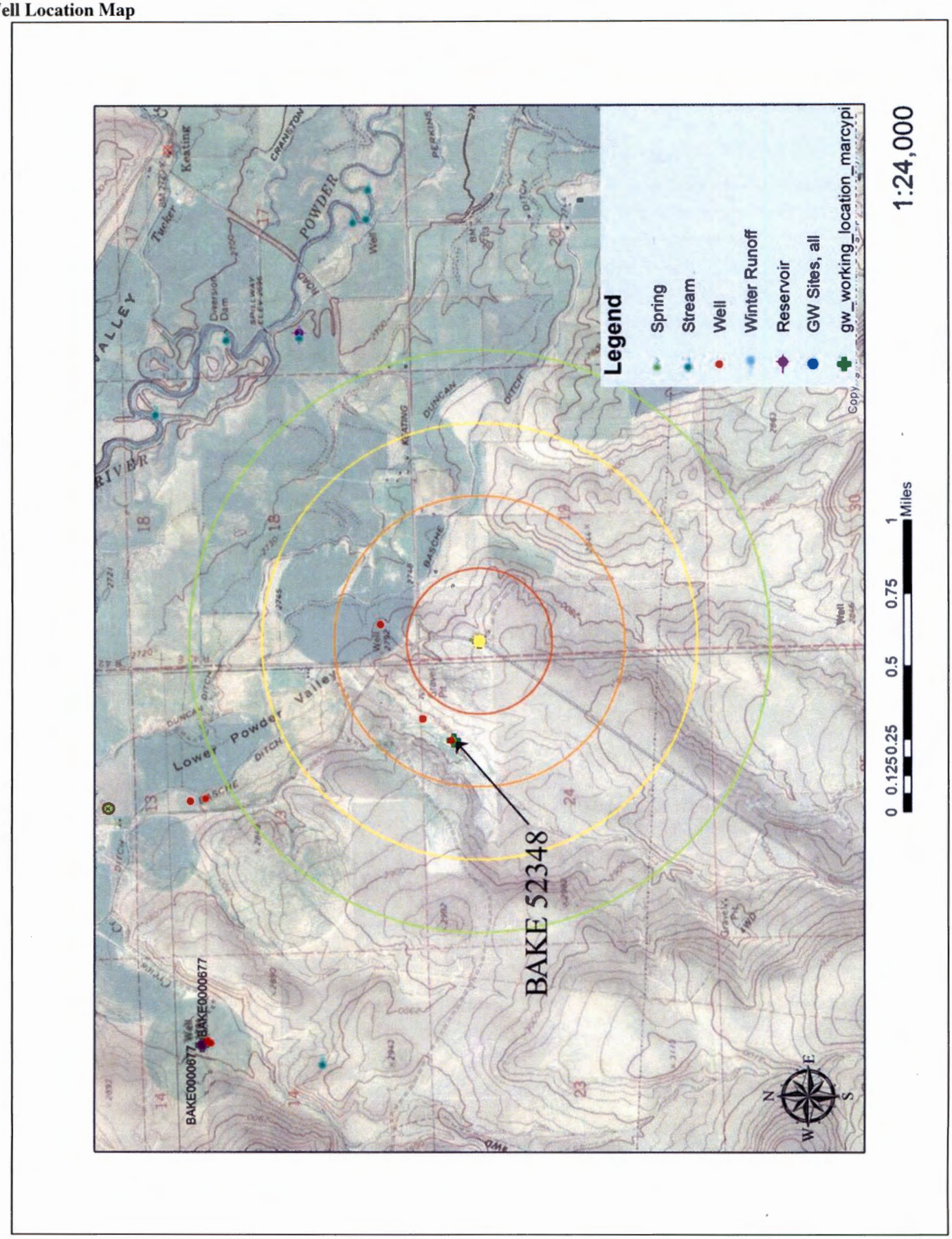
POWDER R > SNAKE R - AB GOOSE CR

Watershed ID #: 72192 Basin: POWDER Exceedance Level: 80

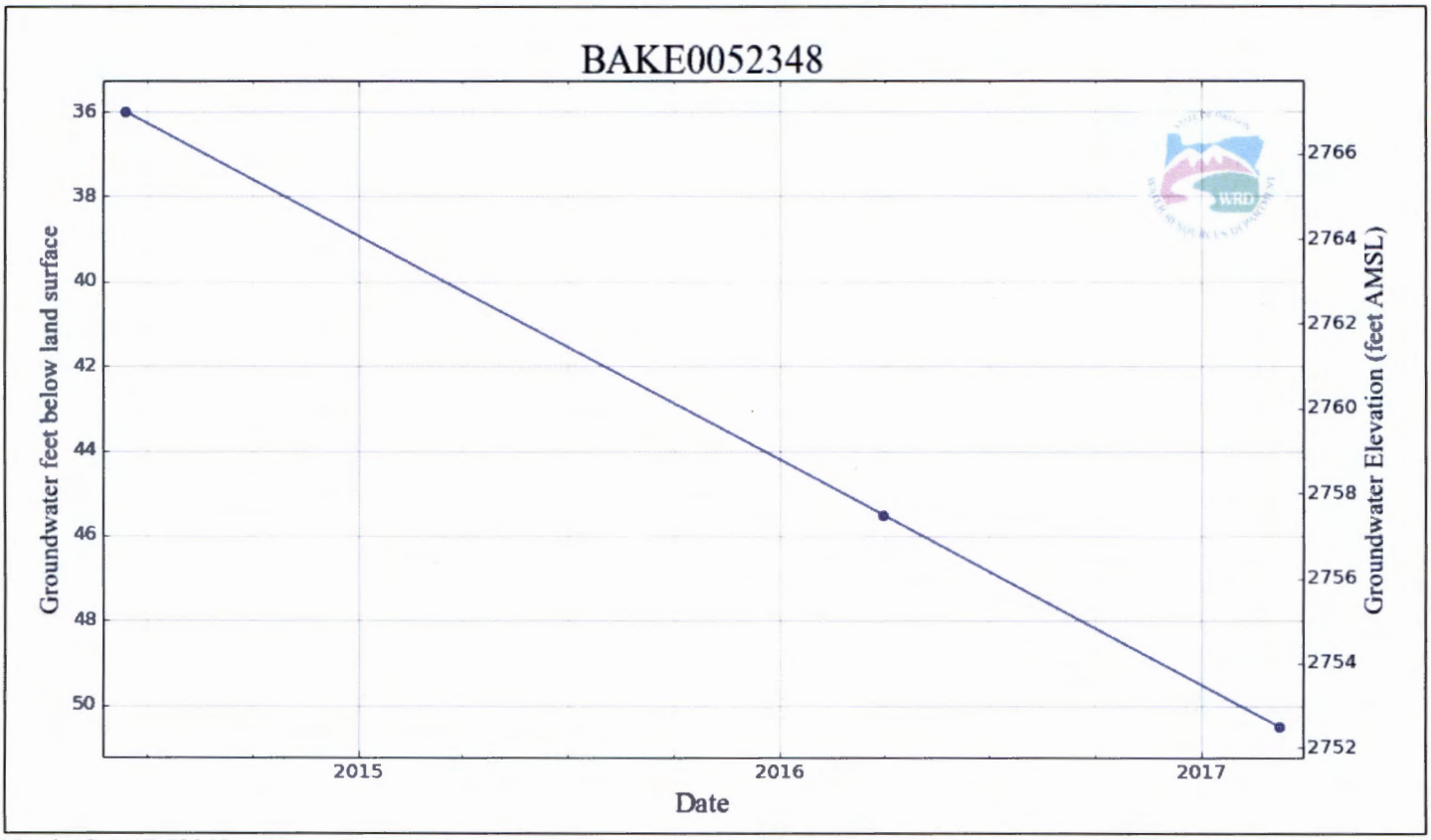
Time: 11:30 AM Date: 11/21/2017

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	76.20	118.00	-41.90	6.37	50.00	-98.30
FEB	128.00	139.00	-10.80	20.60	60.00	-91.40
MAR	254.00	218.00	36.00	61.60	70.00	-95.60
APR	580.00	416.00	164.00	251.00	70.00	-157.00
MAY	800.00	1,010.00	-205.00	140.00	70.00	-416.00
JUN	620.00	1,070.00	-452.00	0.00	70.00	-522.00
JUL	210.00	578.00	-368.00	0.00	50.00	-418.00
AUG	110.00	356.00	-246.00	0.00	50.00	-296.00
SEP	75.70	275.00	-199.00	0.00	50.00	-249.00
OCT	73.60	95.20	-21.60	4.67	50.00	-76.30
NOV	80.20	73.70	6.49	5.56	50.00	-49.10
DEC	85.80	133.00	-46.90	6.14	50.00	-103.00
ANN	287,000	271,000	67,600	29,900	41,600	28,000

Well Location Map



Water-Level Trends in Nearby Wells



Nearby BAKE 52348 produces from the deep-seated volcanic aquifer and displays declining water levels during the past three years. Until more data becomes available that illustrates stability in this aquifer, allocation of groundwater from the volcanic aquifer shall be approached with extreme caution.