PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date **December 30, 2015**

FROM: Groundwater Section **Aurora C Bouchier / Ken Lite**
Reviewer's Name

SUBJECT: Application G- **18152** 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: **Gorham Blaine** County: **Wasco**

A1. Applicant(s) seek(s) (400 gpm) **0.89** cfs from **1** well(s) in the **Deschutes** Basin, **White River** subbasin

A2. Proposed use **Supp Irr (308.1 acres)** Seasonality: **March 1 – October 1**

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	WASC 52229	Well	Bedrock	0.89	4S/12E-34 NW-SW	1510' N, 380' E fr SW cor S 34
2						
3						
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	1963	745	530	9/10/2014	980	0-138	+2-138	-	-	300	448	Air

Use data from application for proposed wells.

A4. **Comments:** As reported on the well log, the air test resulted in 100% drawdown after 2 hours at a rate of 300 gpm. The applicant is requesting 400 gpm for supplemental irrigation for their orchard. Therefore, the resource may not be available in the amount requested.

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 well is located outside the USGS Deschutes Groundwater Study area.

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, 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 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:**

Based on the well log, the well develops water from sedimentary rocks lying beneath approximately 140 feet of basalt, which in turn is located beneath nearly 120 feet of layered cinders. The water-bearing sedimentary rocks are likely sandstones from the Tygh Valley Formation (Ttv) (Sherrod, 1995, Westby, 2014).

There are few nearby, comparable, wells with groundwater observation data. Based on a well log comparison, the elevation of the static water levels reported on well logs, and a published geologic map (Sherrod, 1995), it appears that the applicant's well (WASC 52229) and a nearby well (WASC 51459, located approximately 1.2 miles to the northwest) are likely both withdrawing from water-bearing zones within the Tygh Valley Formation. The hydrograph for WASC 51459 shows a decline of nearly 80 feet between 2010 and 2014 (see below). However, the static water level reported for 2014 is suspect and needs to be examined. The lack of observation data in the formation in the area speaks to the need for condition 7N, annual water level measurements.

The White River exposes the contact between the Juniper Basalt and the underlying Tygh Valley Formation approximately 2.7 miles to the northeast, at an elevation of approximately 1300 feet. The applicant's well is likely located within a rhyolitic dome complex dome which creates Graveyard Butte (Westby, 2014). The presence of this geologic dome complicates the groundwater story and speaks further to the need for annual water level measurements.

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 Bedrock**	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The static water level is above the depth where groundwater was encountered in the well.

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**	**Gate Creek**	**1430**	**1865**	**3160**	☐	☒	☐	☐	☒
1	**2**	**White River**	**1430**	**1415**	**3715**	☒	☐	☐	☐	☒
1	**3**	**Rock Creek**	**1430**	**1694**	**4522**	☐	☒	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: The static water level is slightly above the elevation of the White River at the adjacent reach. The White River is deeply incised into the surrounding bedrock, and within a mile of the applicant's well the river cuts below the elevation of the water-bearing zone indicated in the well log.

Water Availability Basin the well(s) are located within: 70088: WHITE R> DESCHUTES R- 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	**2**	☐	☐	**70088**	**60**	☒	**148.00**	☐	**See comments**	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: The nature of the aquifer unit precludes the use of available analytical models to evaluate the timing of interference.

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 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 for G-18152, as well as nearby G-16484, and G-17252

Sherrod, D.R., and Scott, W.E., 1995. Preliminary Geologic Map of the Mount Hood 30- by 60-Minute Quadrangle, Cascade Range, North-Central Oregon: US Geological Survey Open-File Report 95-219.

USGS Quadrangle Map: Wamic and Tygh Vally.

Well Reports for WASC 52229, WASC 51459, WASC 51293, WASC 51185 and WASC 52311.

Westby, E.G., 2014. The geology and Petrology of Enigmatic Rhyolites at Graveyard and Gordon Buttes, Mount Hood Quadrangle, Oregon: Dissertations and Thesis (Portland State University). Paper 2063.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** Well **Logid:** WASC 52229

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

WHITE R > DESCHUTES R - AT MOUTH
Watershed ID #: 70088 Basin: DESCHUTES Exceedance Level: 80
Time: 2:54 PM Date: 12/23/2015

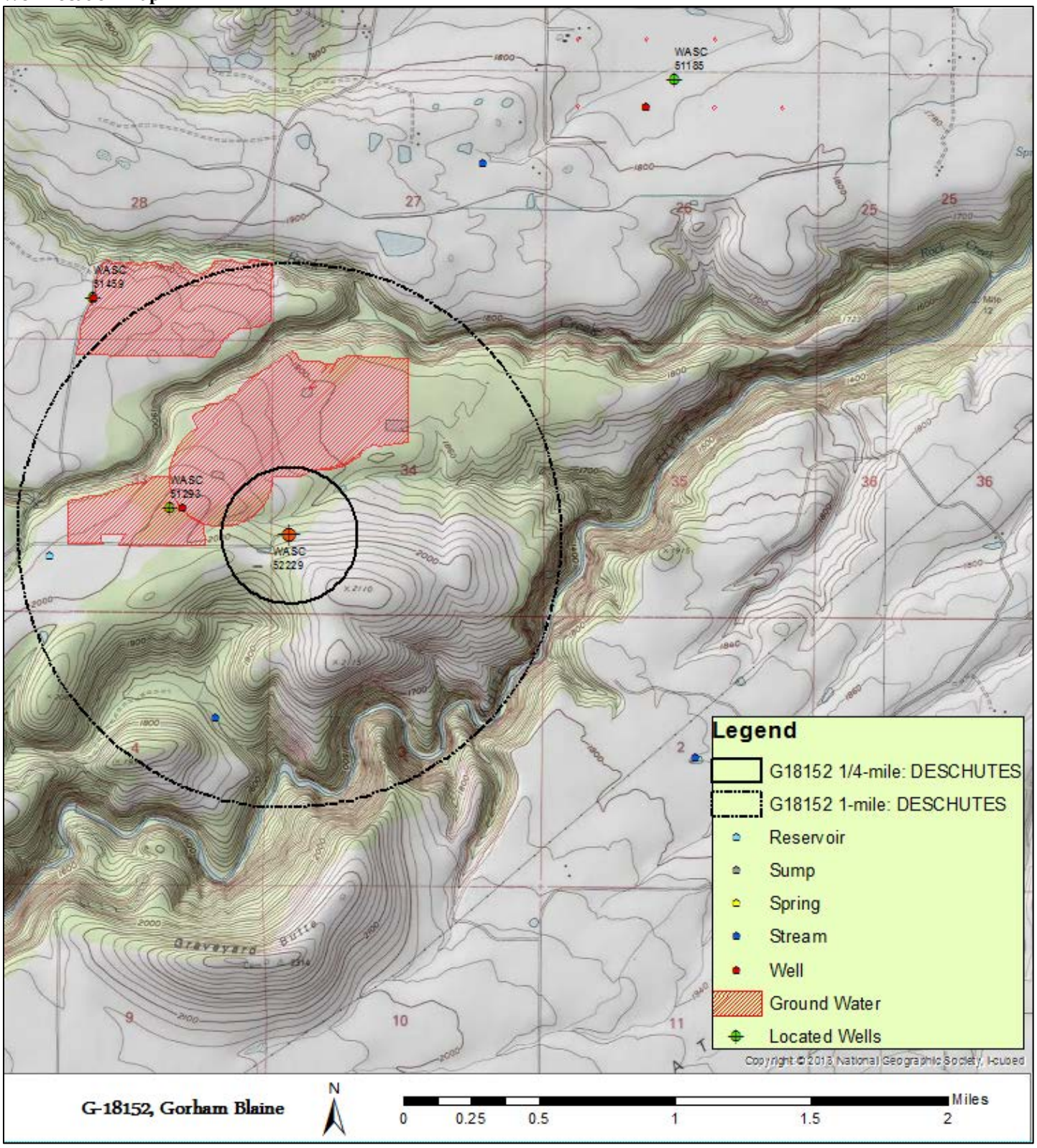
Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
	Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.					
JAN	250.00	21.80	228.00	0.00	60.00	168.00
FEB	366.00	38.50	327.00	0.00	100.00	227.00
MAR	376.00	42.20	334.00	0.00	145.00	189.00
APR	452.00	64.10	388.00	0.00	145.00	243.00
MAY	477.00	113.00	364.00	0.00	145.00	219.00
JUN	290.00	121.00	169.00	0.00	100.00	69.00
JUL	192.00	89.60	102.00	0.00	60.00	42.40
AUG	159.00	72.40	86.60	0.00	60.00	26.60
SEP	148.00	64.50	83.50	0.00	60.00	23.50
OCT	149.00	52.00	97.00	0.00	60.00	37.00
NOV	151.00	5.82	145.00	0.00	60.00	85.20
DEC	211.00	8.59	202.00	0.00	60.00	142.00
ANN	276,000	41,900	234,000	0	63,600	171,000

DETAILED REPORT OF INSTREAM REQUIREMENTS

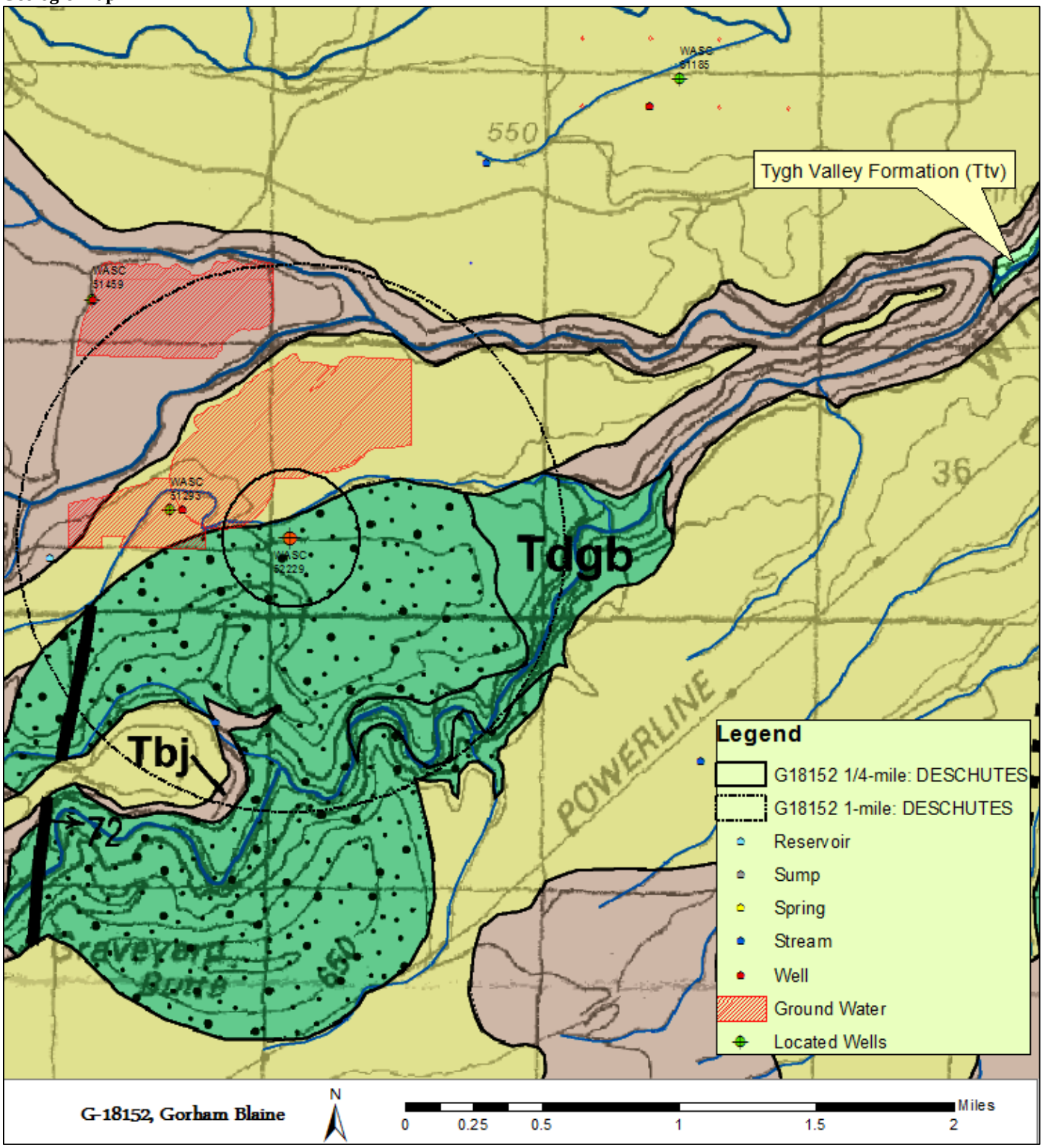
WHITE R > DESCHUTES R - AT MOUTH
Watershed ID #: 70088 Basin: DESCHUTES
Time: 3:22 PM Date: 12/23/2015

Application Number	Status	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		Monthly values are in cfs.											
MF201A	CERTIFICATE	60.0	95.0	95.0	95.0	95.0	95.0	60.0	60.0	60.0	60.0	60.00	60.0
MF202A	CERTIFICATE	60.0	100.0	145.0	145.0	145.0	100.0	60.0	60.0	60.0	60.0	60.00	60.0
IS70088A	CERTIFICATE	60.0	100.0	145.0	145.0	145.0	100.0	60.0	60.0	60.0	60.0	60.00	60.0
MAXIMUM		60.0	100.0	145.0	145.0	145.0	100.0	60.0	60.0	60.0	60.0	60.0	60.0

Well Location Map



Geologic Map



Water-Level Trends in Nearby Wells