

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 06/05/2018  
 FROM: Groundwater Section Phillip I. Marcy  
 Reviewer's Name  
 SUBJECT: Application G- 18320 Supersedes review of 08/17/2016  
 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: John & Kathryn Rohner County: Baker

A1. Applicant(s) seek(s) 2.9 cfs from 3 well(s) in the Powder Basin,  
 \_\_\_\_\_ subbasin

A2. Proposed use Irrigation (200 acres) / Supplemental Irrigation (192.5 acres)  
 Seasonality: March 1<sup>st</sup> – October 31<sup>st</sup> (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	Alluvium	2.9	9S/39E-11 SW-NE	2040'S, 1670'W fr NW cor, S 12
2	Proposed	2	Alluvium	2.9	9S/39E-11 SE-NE	1720'N, 2225'W fr NW cor, S 12
3	Proposed	3	Alluvium	2.9	9S/39E-2 NW-SE	3375'N, 1574'W fr NW cor, S 12
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	3394	NA	NA	NA	300	0-50	0-300	Unknown	Unknown	NA	NA	NA
2	3384	NA	NA	NA	300	0-50	0-300	Unknown	Unknown	NA	NA	NA
3	3375	NA	NA	NA	300	0-50	0-300	Unknown	Unknown	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** This re-review considers changes on the applicant's proposed POA locations and lowered rate request (from 4.0 to 2.9 cfs).

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 \_\_\_\_\_ 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:** The proposed POA locations on the applicant’s revised map are no less than 2180’ from the nearest neighboring point of appropriation. Based on this distance, calculations of expected drawdown at neighboring wells over time predict less than 8 feet of seasonal drawdown over the course of an irrigation season. Aquifer parameters used for these calculations are fairly conservative for sand and gravel, and lie within the range of results of local pump tests conducted within the alluvial aquifer.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**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	Terrace and fan deposits (Qtg of Brooks, 1976)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Terrace and fan deposits (Qtg of Brooks, 1976)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Terrace and fan deposits (Qtg of Brooks, 1976)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer confinement evaluation:** The geologic description of these terrace and fan deposit refers to them as “mixed grain sediments” of “clay to boulder” size grains (Brooks and others, 1976). In these poorly sorted materials, there exists no continuous barrier to vertical migration of groundwater. In addition, well logs in the area do not report head elevations that are significantly higher than the elevation at which water was first encountered, indicating that groundwater here is in equilibrium with atmospheric pressure. Deeper wells producing from “broken rock”, likely TRgb1 or Tb1 of Brooks and others (1976) are reported to have considerable artesian pressure, rising well above their respective production zones.

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	Powder River	3380	3380	16950	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Powder River	3380	3380	17275	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	1	Powder River	3380	3380	16712	<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"/>

**Basis for aquifer hydraulic connection evaluation:** The close correspondence of groundwater and surface water elevations supports the idea that both are part of a larger, interconnected hydraulic system. Since there exists no laterally continuous barrier to vertical groundwater movement, it is likely that these elevations reflect the regional groundwater table in a discharge zone. Based on this conceptual model, it is expected that nearly all water produced from wells in the proposed aquifer system would otherwise be destined for local surface water drainages.

**Water Availability Basin the well(s) are located within:** Powder River > Snake River – Above Rock Creek (#30920327)

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: 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
3	1	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Well Q as CFS		0.0	0.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	0.0	0.0
Interference CFS		0.013	0.014	0.001	0.002	0.003	0.004	0.005	0.007	0.008	0.010	0.011	0.012
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													
(A) = Total Interf.		0.013	0.014	0.001	0.002	0.003	0.004	0.005	0.007	0.008	0.010	0.011	0.012
(B) = 80 % Nat. Q		36.9	58.7	99.8	213	300	163	42.0	17.6	12.6	15.4	25.2	34.9
(C) = 1 % Nat. Q		.37	.59	1.0	2.1	3.0	1.6	.42	.18	.13	.15	.25	.35
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		.035 %	.024 %	.001 %	.001 %	.001 %	.003 %	.012 %	.040 %	.063 %	.065 %	.044 %	.034 %

(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:** Expected impacts to the Powder River due to pumping at the proposed POA location closest to the stream were calculated using the model of Hunt (2003). Aquifer parameters were assigned based upon available pump test data from this area, with standard values for streambed thickness and permeability based upon the geomorphology and vigor of the stream (see attached model output). Model results conclude that within the first year of pumping, expected impacts to surface water at the given distance are minimal, due to the presence of fine-grained sediments underlying the stream channel.

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:** Based on our current understanding, the upper portions of Baker Valley are part of a single groundwater reservoir, including surface water and shallow well discharge. Hydraulic connection between wells and streams may vary based on location and distribution of fine-grained sediments in the subsurface. While little information is available on the deeper volcanic aquifer system, well log reports from wells completed into volcanics indicate confined conditions, and likely an inefficient connection to surface waters.

**References Used:**

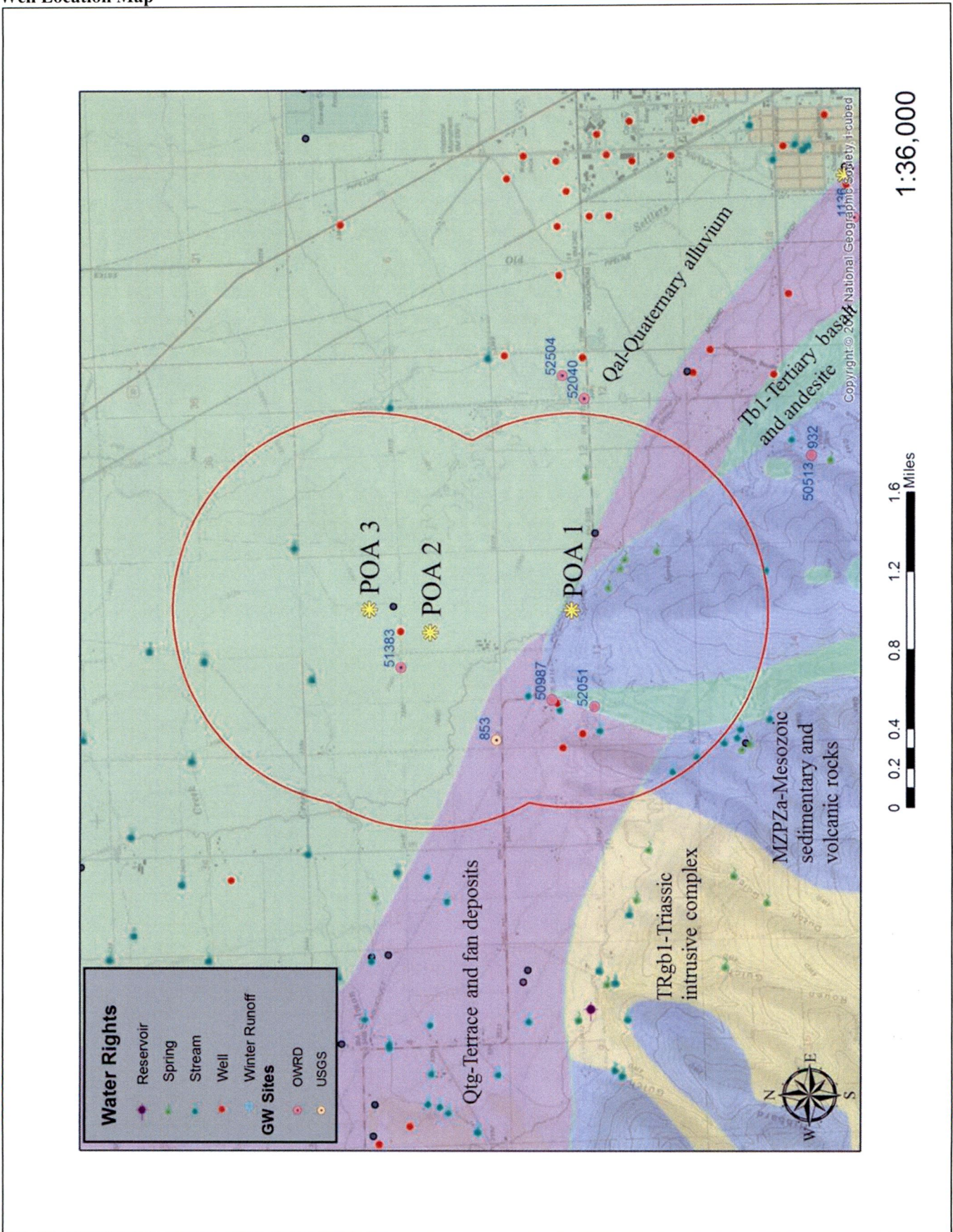
Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

Brooks, H.C., McIntyre, J.R., and Walker, G.W. Geologic Map of the Oregon Part of the Baker 1 degree by 2 degree Quadrangle/GMS 7. Scale 1:250,000. State of Oregon Department of Geology and Mineral Industries, 1976.

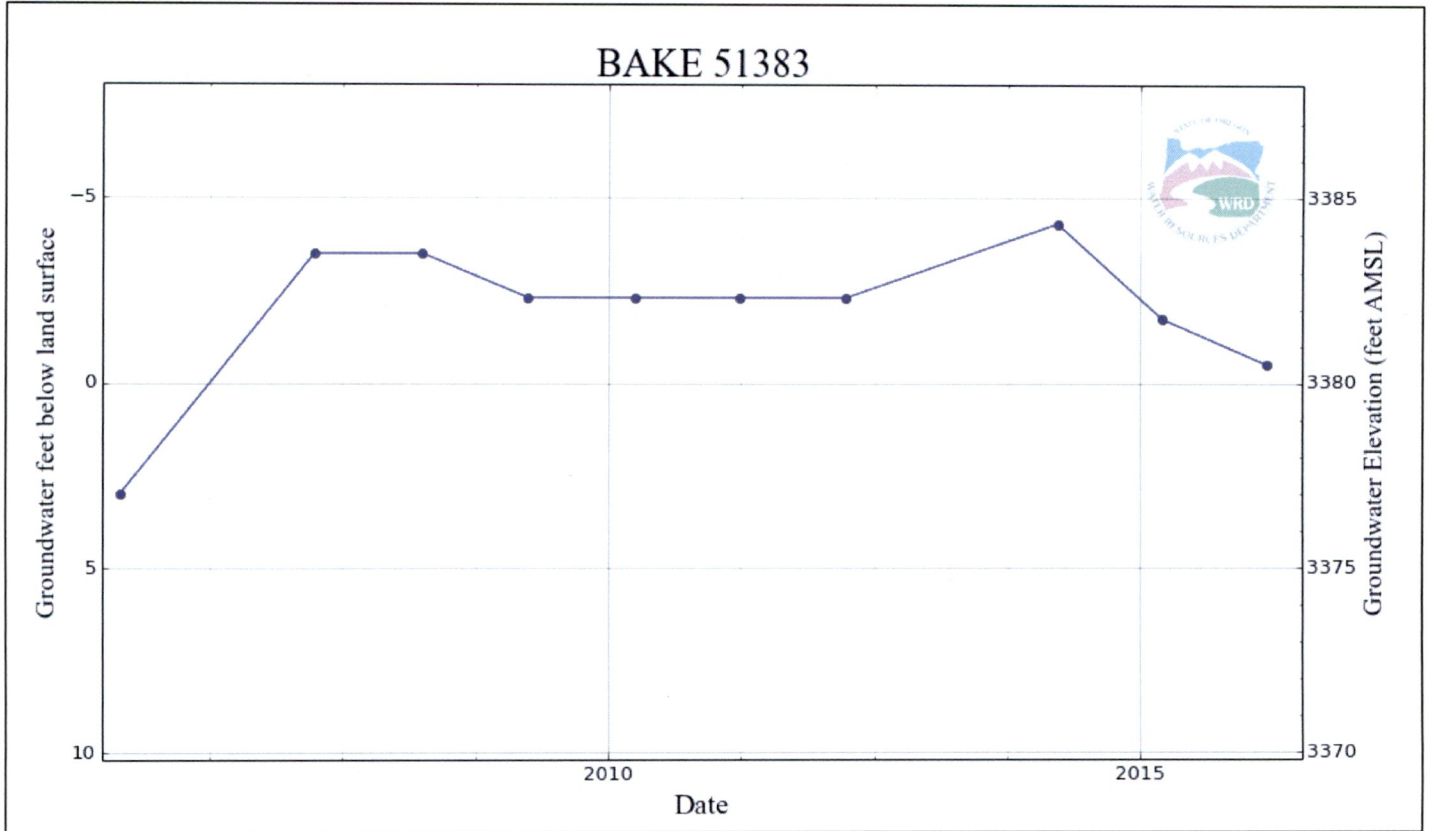
Local well logs, local pump tests, application file G18320.



### Well Location Map

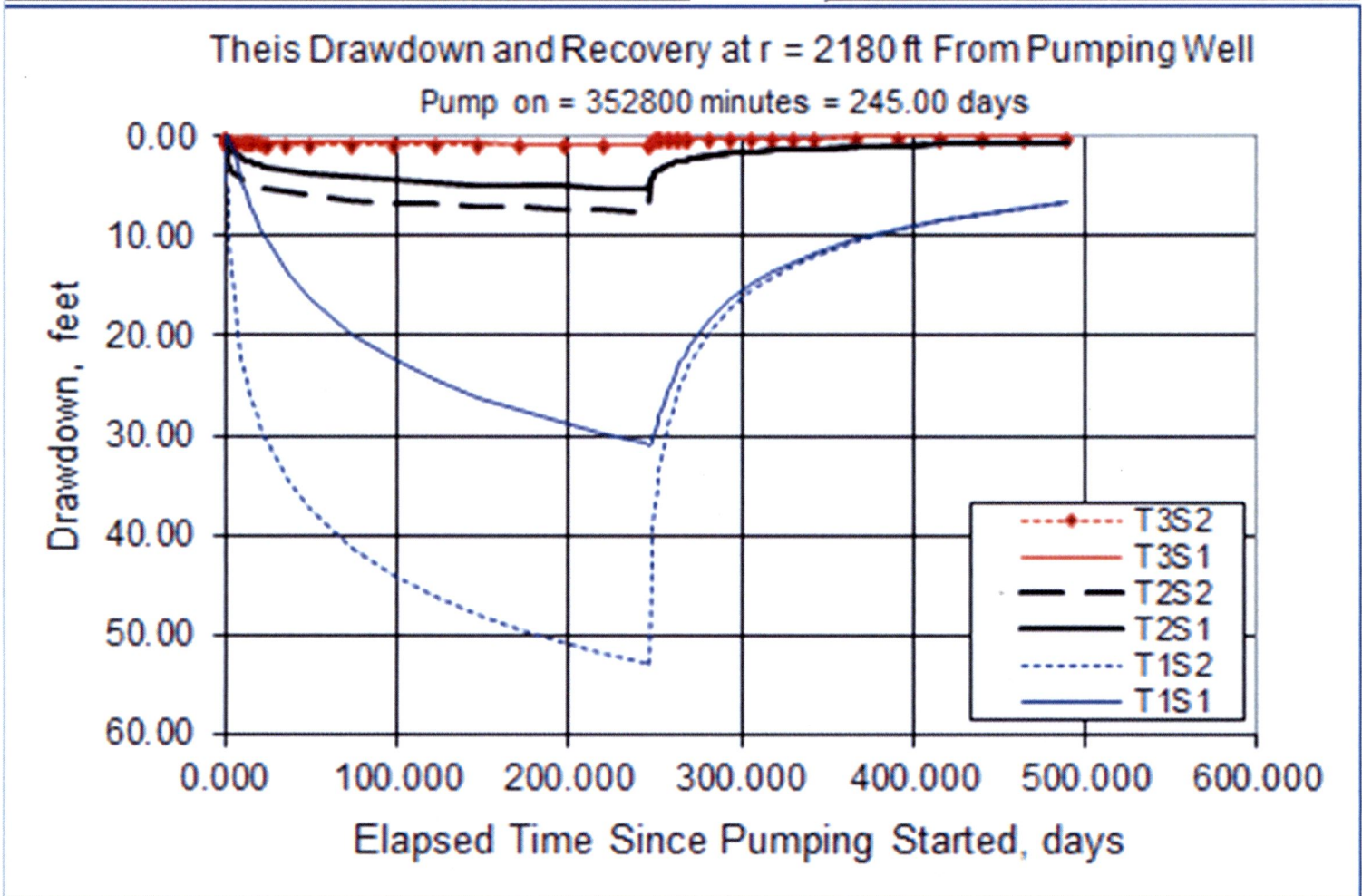


Water-Level Trends in Nearby Wells





Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units	
Total pumping time	t		245		d	
Radial distance from pumped well:	r		2180.00		ft	<b>Q conversions</b>
Pumping rate	Q		2.9		cfs	1,301.52 gpm
Hydraulic conductivity	K	41	413	4,130	ft/day	2.90 cfs
Aquifer thickness	b		50		ft	174.00 cfm
Storativity	S 1		0.01000			250,560.00 cfd
	S 2		0.00100			5.75 af/d
Transmissivity Conversions	T f2pd	2,065	20,650	206,500	ft <sup>2</sup> /day	
	T ft2pm	1.4340	14.3403	143.4028	ft <sup>2</sup> /min	
	T gpdpft	15,446	154,462	1,544,620	gpd/ft	



The most likely scenario for drawdown at the nearest POA from the proposed use is that depicted by the solid black line (T2S2), using aquifer parameters that fall within the range of sand and gravel aquifers and those of nearby pump tests.