

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 6/15/2020
 FROM: Groundwater Section Benjamin Scandella, Jen Woody
Reviewer's Name
 SUBJECT: Application G-18757 Supersedes review of 3/22/2019, 10/18/2019
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: **TOUCHMARK HEIGHTS LLC** County: **WASHINGTON**

A1. Applicant(s) seek(s) 0.134 CUBIC FOOT PER SECOND from 1 well(s) in the Willamette Basin, Tualatin subbasin

A2. Proposed use **AGRICULTURE USES, IRRIGATION** Seasonality: Agriculture uses: **JANUARY 1 THROUGH DECEMBER 31**, Irrigation: **MARCH 1 THROUGH 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		Volcanic/Volcaniclastic	0.134	1S/1W-1 NE-NW	377' W, 392' S fr N cor S 1

* 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	850	Un-known	382*	Aug. 1951*	420	0-200	0-200	TBD	TBD	60*	0	Un-known

Use data from application for proposed wells.

A4. **Comments:** The applicant's proposed well is located in the west foothills of the Tualatin mountains, about 1 mile northwest of Sylvan. The application suggests that the source aquifer would be "BEDROCK," but geologic analysis suggests that the well is completed into the Quaternary-Late Tertiary Volcanic and Volcaniclastic Aquifer System.
*water level and yield are estimated based on WASH 8638, which is adjacent to the proposed well.

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: 690-502-0240 classifies use from unconfined alluvial aquifers within ¼ mile of a stream or surface water source. The only such surface water source within ¼ mile is Golf Creek, which is ephemeral and does not have any special classification in 690-502-130 for the Tualatin River Subbasin.

A6. **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
 Name of administrative area: _____
 Comments: N/A

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 (Annual Measurement), 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 a single aquifer within the Quaternary-Late Tertiary Volcanic and Volcaniclastic Aquifer System 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 applicant's proposed well is located on the west slope of the Tualatin Mountains, which consist primarily of uplifted Columbia River Basalts. Overlying the basalts on the west slope are undifferentiated Valley Fill sediments and a discontinuous surficial layer of Boring Lava (Conlon, 2005; Hart and Newcomb, 1965; Woodward *et al.*, 1998). Each of these hydrogeologic units appear on nearby well logs, and mapped faulting in the region juxtaposes these hydrogeologic units and may provide vertical connectivity between them. This varied lithology suggests that the aquifer system accessed by the well is within the Quaternary-Late Tertiary Volcanic and Volcaniclastic (QLTV) Aquifer System.

In the original GW review, the QLTV Aquifer System was found to be connected with the Columbia River Basalt Group (CRBG) Aquifer System based on coincidence of water levels between WASH 8638 and MULT 901. Given the best available information at that time, water levels over 200 feet higher in MULT 901 in the 1970s and 1980s indicated excessive declines, such that further extraction would have been beyond the capacity of the aquifer. A field visit and measurements collected by OWRD staff on 10/11/2019 suggested that the high water levels originally reported in MULT 901 were likely measured in a different well. Therefore, the subject well and MULT 901 show a relatively stable water level trend over the period of record. Recent divergence of water levels in MULT 901 and WASH 89 suggest that those wells access different aquifers. Considering this more recent information, the original finding, that water is not available within capacity of the resource, was reversed. The lack of water level data in the QLTV in the vicinity of WASH 8638 warrants including the permit conditions indicated in section B1di above to monitor the resource and protect existing users.

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	Volcanic/Volcaniclastic aquifer	<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"/>

Basis for aquifer confinement evaluation: Nearly all of the wells in this area show water levels below or coincident with the top of the water-bearing zone, indicating that the aquifer is not confined.

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	Johnson Creek	470	360	8200	<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 nearest perennial stream reach is Johnson Creek, more than 1.5 miles away. Due to the distance and low hydraulic conductivity of the alluvial aquifer system in this area, it is possible that WASH 8638 is hydraulically connected with Johnson creek despite the 110' difference in water elevations. There is a surface water POD about 800' to the SE, but this uses winter runoff in ephemeral Golf Creek to fill 4 reservoirs. Golf Creek is presumed to be dry during the irrigation season.

Water Availability Basin the well(s) are located within: ROCK CR > TUALATIN R - AT MOUTH (WID 73545), FANNO CR > TUALATIN R - AT MOUTH (WID 73543)

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"/>
		<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: N/A

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													
(A) = Total Interf.													
(B) = 80 % Nat. Q		105	141	115	60	23	12.3	2.58	2.72	3.68	4.57	4.02	47.4
(C) = 1 % Nat. Q		1.050	1.410	1.150	0.600	0.230	0.123	0.026	0.027	0.037	0.046	0.040	0.474
(D) = (A) > (C)													
(E) = (A / B) x 100		<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%

(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: Depletion of Johnson Creek was modeled using the Hunt (1999) analytical stream depletion model assuming constant pumping at the maximum rate and using published aquifer parameter ranges (see screenshot of model results below) (Conlon, 2005). The stream depletion values are not indicated in the table above due to the large range of plausible results, but under the most likely parameter values (Scenario 2), stream depletion remains well below 1% of the 80% natural flow in all months so that PSI is not triggered per OAR 690-009-0040.

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:

Conlon, T.D., 2005. Ground-Water Hydrology of the Willamette Basin, Oregon. Reston, Va.: U.S. Dept. of the Interior, U.S. Geological Survey. <http://purl.access.gpo.gov/GPO/LPS100769>. Accessed 7 Jun 2018.

Hart, D.H. and R.C. Newcomb, 1965. Geology and Ground Water of the Tualatin Valley, Oregon. USGS Numbered Series, U.S. G.P.O., <http://pubs.er.usgs.gov/publication/wsp1697>. Accessed 26 Feb 2019.

Hunt, B., 1999. Unsteady Stream Depletion from Ground Water Pumping. Groundwater 37:98–102.

Woodward, D.G., M.W. Gannett, and J.J. Vaccaro, 1998. Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington. U.S. G.P.O. ; For sale by U.S. Geological Survey, Information Services, Washington : Denver, CO.

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.**

Figure 1: Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

ROCK CR > TUALATIN R - AT MOUTH
Basin: WILLAMETTE

Watershed ID #: 73545 Exceedance Level: 80
Time: 2:29 PM Date: 02/26/2019

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	105.00	1.31	104.00	0.00	2.50	101.00
FEB	141.00	1.62	139.00	0.00	2.50	137.00
MAR	115.00	0.91	114.00	0.00	2.50	112.00
APR	60.10	0.73	59.40	0.00	2.50	56.90
MAY	23.80	2.84	21.00	0.00	2.50	18.50
JUN	12.30	3.52	8.78	0.00	2.50	6.28
JUL	2.58	4.93	-2.35	0.00	2.50	-4.85
AUG	2.72	4.22	-1.50	0.00	2.50	-4.00
SEP	3.68	2.21	1.47	0.00	2.50	-1.03
OCT	4.57	0.23	4.34	0.00	2.50	1.84
NOV	4.02	0.48	3.54	0.00	2.50	1.04
DEC	47.40	1.31	46.10	0.00	2.50	43.60
ANN	81,500	1,470	80,100	0	1,810	78,400

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

FANNO CR > TUALATIN R - AT MOUTH
Basin: WILLAMETTE

Watershed ID #: 73543 Exceedance Level: 80
Time: 2:30 PM Date: 02/26/2019

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	49.50	28.50	21.00	0.00	2.50	18.50
FEB	55.80	28.50	27.30	0.00	2.50	24.80
MAR	44.30	28.40	15.90	0.00	2.50	13.40
APR	26.30	28.40	-2.07	0.00	2.50	-4.57
MAY	13.20	29.30	-16.10	0.00	2.50	-18.60
JUN	7.00	29.50	-22.50	0.00	2.50	-25.00
JUL	4.72	30.00	-25.30	0.00	2.50	-27.80
AUG	3.83	29.80	-25.90	0.00	2.50	-28.40
SEP	3.41	29.00	-25.60	0.00	2.50	-28.10
OCT	3.31	28.30	-25.00	0.00	2.50	-27.50
NOV	9.11	28.30	-19.20	0.00	2.50	-21.70
DEC	32.90	28.50	4.44	0.00	2.50	1.94
ANN	30,300	20,900	17,100	0	1,810	16,300

Figure 2: Well Location Map

G-18757 (Touchmark Heights LLC). T1S/R1W - S1

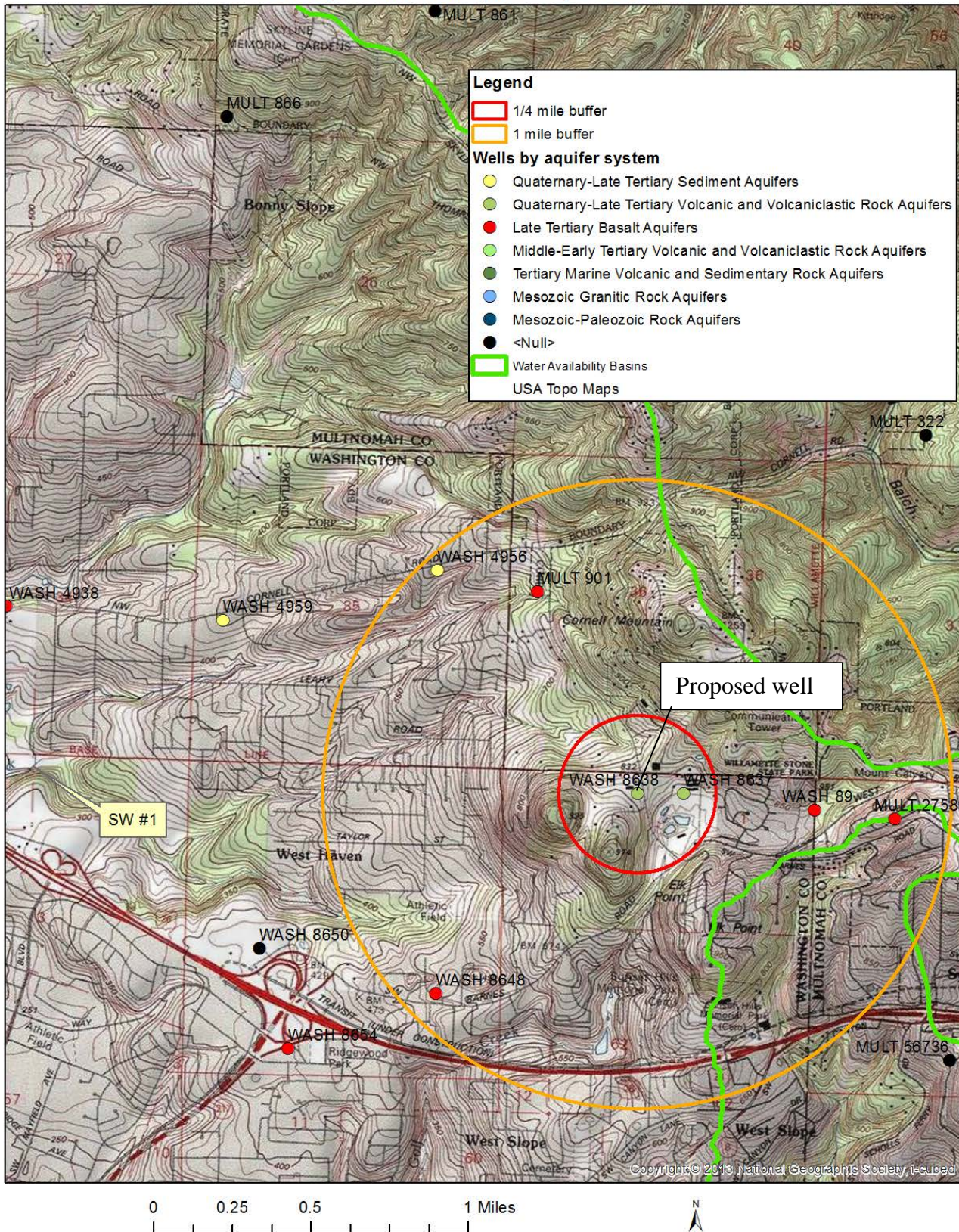


Figure 3: Hydrograph of Water Levels in Nearby Wells

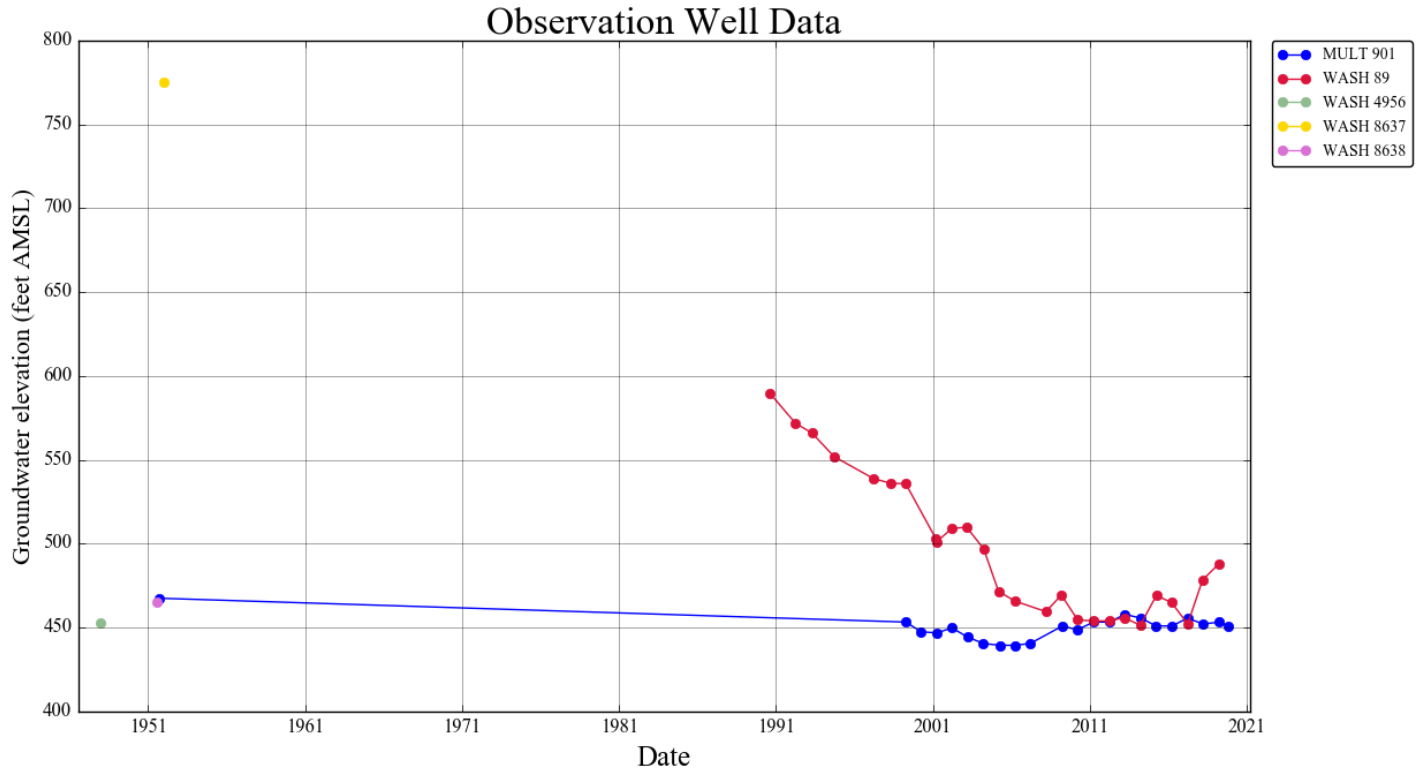


Figure 4: Results of stream depletion modeling

Application type:	G
Application number:	18757
Well number:	1
Stream Number:	1
Pumping rate (cfs):	0.134
Pumping duration (days):	100.0
Pumping start month number (3=March)	3.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	8200.0	8200.0	8200.0	ft
Aquifer transmissivity	T	100.0	1000.0	10000.0	ft ² /day
Aquifer storativity	S	0.1	0.05	0.01	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.1	1.0	ft/day
Not used		20.0	20.0	20.0	
Aquitard thickness below stream	babs	5.0	3.0	1.0	ft
Not used		0.2	0.2	0.2	
Stream width	ws	5.0	10.0	20.0	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	330
Depletion (%)	0	0	0	0	0	0	0	0	0	0	0	0
Depletion (cfs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

