PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 10/10/2019

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

SUBJECT: Application G- 17592 Supersedes review of April 15, 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: **Golden Rule Farms, Inc.** County: **Harney**

A1. Applicant(s) seek(s) 15.9 cfs from 8 well(s) in the Malheur Basin, S. Fork Malheur River subbasin

A2. Proposed use Irrigation (952 acres) Seasonality: **March 1 to October 31 (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	Briggs 10	Alluvium/Volcanics	2.67	27S/34E-20 SE-SE	660'N, 660'W fr SE cor S 20
2	Proposed	Briggs 11	Alluvium/Volcanics	2.67	27S/34E-20 SW-NE	2640'N, 1930'W fr SE cor, S 20
3	Proposed	Briggs 12	Alluvium/Volcanics	2.67	27S/34E-20 NW-NW	1320'S, 1320'E fr NW cor, S 20
4	Proposed	Briggs 13	Alluvium/Volcanics	2.67	27S/34E-19 NE-NE	1310'S, 1310'W fr NE cor, S 19
5	Proposed	Briggs 14	Alluvium/Volcanics	2.67	27S/34E-17 SW-SW	770'N, 135'E fr SW cor S 17
6	Proposed	Briggs 15	Alluvium/Volcanics	2.67	27S/34E-17 SW-NW	2600'S, 30'E fr NW cor S 17
7	Proposed	Briggs 16	Alluvium/Volcanics	2.67	27S/34E-18 NW-SE	1320'N, 2630'W fr SE cor, S 18
8	Proposed	Briggs 17	Alluvium/Volcanics	2.67	27S/34E-19 SE-NW	1400'S, 1075'E fr NW cor S19

* 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	4272	NA	NA	NA	TBD	TBD	TBD	TBD	TBD	NA	NA	NA
2	4271	NA	NA	NA	TBD	TBD	TBD	TBD	TBD	NA	NA	NA
3	4277	NA	NA	NA	TBD	TBD	TBD	TBD	TBD	NA	NA	NA
4	4304	NA	NA	NA	TBD	TBD	TBD	TBD	TBD	NA	NA	NA
5	4293	NA	NA	NA	TBD	TBD	TBD	TBD	TBD	NA	NA	NA
6	4302	NA	NA	NA	TBD	TBD	TBD	TBD	TBD	NA	NA	NA
7	4392	NA	NA	NA	TBD	TBD	TBD	TBD	TBD	NA	NA	NA
8	4348	NA	NA	NA	TBD	TBD	TBD	TBD	TBD	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** This re-review addresses requested changes to previously reviewed application G-17592. The applicant requested to limit proposed POA locations to those within the Malheur River administrative basin (removing those in the Malheur Lake basin), a reduction in rate to 15.9 cfs, and primary irrigation of 952 acres. As stated in previous reviews (M. Zwart, 2013, 2014), wells producing from alluvium or basalt in this area are not considered separate sources, as there is no documented evidence of hydraulic separation between these horizons. Therefore, despite a lack of proposed well construction, all POA wells on this application shall be considered to produce from the greater regional flow system. HARN 52517, drilled in 2016 within 1,000 feet of the proposed location for "Briggs 10" provides insight into the regional hydrogeologic framework, and the reviewer assumes it was constructed for this proposed use. Within this 655' borehole, horizons of clay, sandstone, basalt, pumice, and white rock (tuff?) were encountered during drilling, with no change in static elevation observed from where groundwater was first encountered at 172'.

A5. ☒ **Provisions of the** Malheur 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) _____;
   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 this application are within the Malheur administrative basin, however, all are between 0.5 and 2.5 miles from the Malheur Lake administrative basin and Greater Harney Valley Groundwater Area of Concern (GHVGAC) boundary. This is noteworthy not only because of significant, persistent groundwater declines within the GHVGAC and in neighboring areas, but also because of the similarities in the hydrogeologic setting. Additionally, evaluation of available water level data demonstrates that the surface water divide here does not serve as a groundwater divide, that the proposed wells are a part of the same groundwater flow system as portions of the GHVGAC, and that groundwater flows north- northeast through this area into Virginia Valley.

The hydrograph for wells in the area surrounding the proposed POA locations under G-17592 (see attached) displays general declines in groundwater elevations (locations on attached map). The steepest declines shown here are observed in the Virginia Valley immediately to the north. Declines are less severe in wells within the same WAB as the proposed POA wells, but are noteworthy because there are currently no active groundwater rights within its boundaries. This suggests, for one, that groundwater pumping has had impacts across basin boundaries and for two, that significantly increasing the burden of pumping on the aquifer system locally would likely lead to steeper declines within this WAB, and exacerbate further the declines observed in the Virginia Valley.

Issuance of a permit for the very significant amounts proposed here will likely result in water-level declines at the proposed wells that would exceed the limits set forth in permit condition 7N, which is typically recommended. Additionally, junior groundwater rights near the proposed POA locations have decline conditions that would be triggered earlier if the proposed additional use was approved.

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
All	**Alluvium and valley-fill sediments and/or underlying,**	☐	☒
	overlying or interbedded basalt, volcanic,	☐	☐
	sedimentary and volcaniclastic rocks.	☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The application proposes minimal casing and seal depth for all proposed wells. Therefore, the wells will very likely develop an unconfined aquifer where available.

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
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: No perennial surface waters are located within several miles of the proposed POA locations. The nearby creek is mapped as intermittent and is ephemeral within Adobe Flat, a small closed basin. It is not "tributary" in the usual sense to the South Fork Malheur River and I am therefore not considering it to be a surface water source for this review.

Water Availability Basin the well(s) are located within: S FK MALHEUR R > MALHEUR R - AB INDIAN CR

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
		%	%	%	%	%	%	%	%	%	%	%	%
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: This section does not apply.

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:**

If a permit is issued, the following conditions are recommended:

Special Permit Condition:
The permittee shall construct one (1) minimum six-inch diameter observation well to penetrate the same aquifer as the production wells. The well shall meet the Department's minimum well construction standards and shall be drilled, cased and sealed to the same depth as the production wells. The well shall be constructed at a location approved by the Department for the purpose of instrumentation with continuous water-level monitoring equipment. The landowner or permittee shall provide access to Department staff to install and maintain the monitoring equipment. The well shall not be used for any other purpose while the Department is monitoring water levels. The well shall be completed prior to water use under the terms of any permit issued.

7B: Interference Condition

7F: Proposed Well location Condition

7N: Annual Measurement and Decline Condition

7P: Well Tag Condition

7T: Dedicated Measuring Tube Condition for all POA wells

Flow meter condition: Use the water rights "large" permit condition requiring a totalizing flow meter and reporting

7K: The proposed wells shall each be constructed to develop groundwater from either the predominantly basin fill unit or the underlying predominantly volcanic/basalt bedrock unit, but not both.

If the wells are to develop groundwater from the predominantly volcanic/basalt bedrock unit, the wells shall be continuously cased and continuously sealed a minimum of five (5) feet into the predominantly volcanic/basalt bedrock beneath the predominantly basin fill unit. The wells may not be completed in such a manner that they allow ground water to be developed from the overlying basin fill. If during well construction, it becomes apparent that the wells can be constructed to eliminate interference with nearby shallow wells or hydraulically connected streams in a manner other than specified in this permit, the permittee can contact the Department Hydrogeologist for this permit or the Ground Water/Hydrology Section Manager to request approval of such construction. The request shall be in writing, and shall include a rough well log and a proposed construction design for approval by the Department. The request can be approved only if it is received and reviewed prior to placement of any permanent casing and sealing material. If the well is constructed first and then the request made, requested modification will not be approved. The new well depth and construction specifications will be incorporated into any certificate issued for this permit.

If the wells are to develop groundwater from the predominantly basin fill unit, they may not be completed in such a manner that they allow groundwater to be developed from the underlying predominantly volcanic/basalt bedrock unit. If, during the course of drilling, the well penetrates through the predominantly basin fill unit into the predominantly volcanic/basalt bedrock unit, the lower part of the well below the basin fill shall be properly abandoned (sealed).

References Used:

Greene, Walker, and Corcoran, 1972, Geologic Map of the Burns Quadrangle, Oregon, USGS Miscellaneous Geologic Investigations Map I-680

Original Groundwater Reviews for application G-17592 (Zwart, 2013, 2014)

Local well logs, OWRD GWIS groundwater database.

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

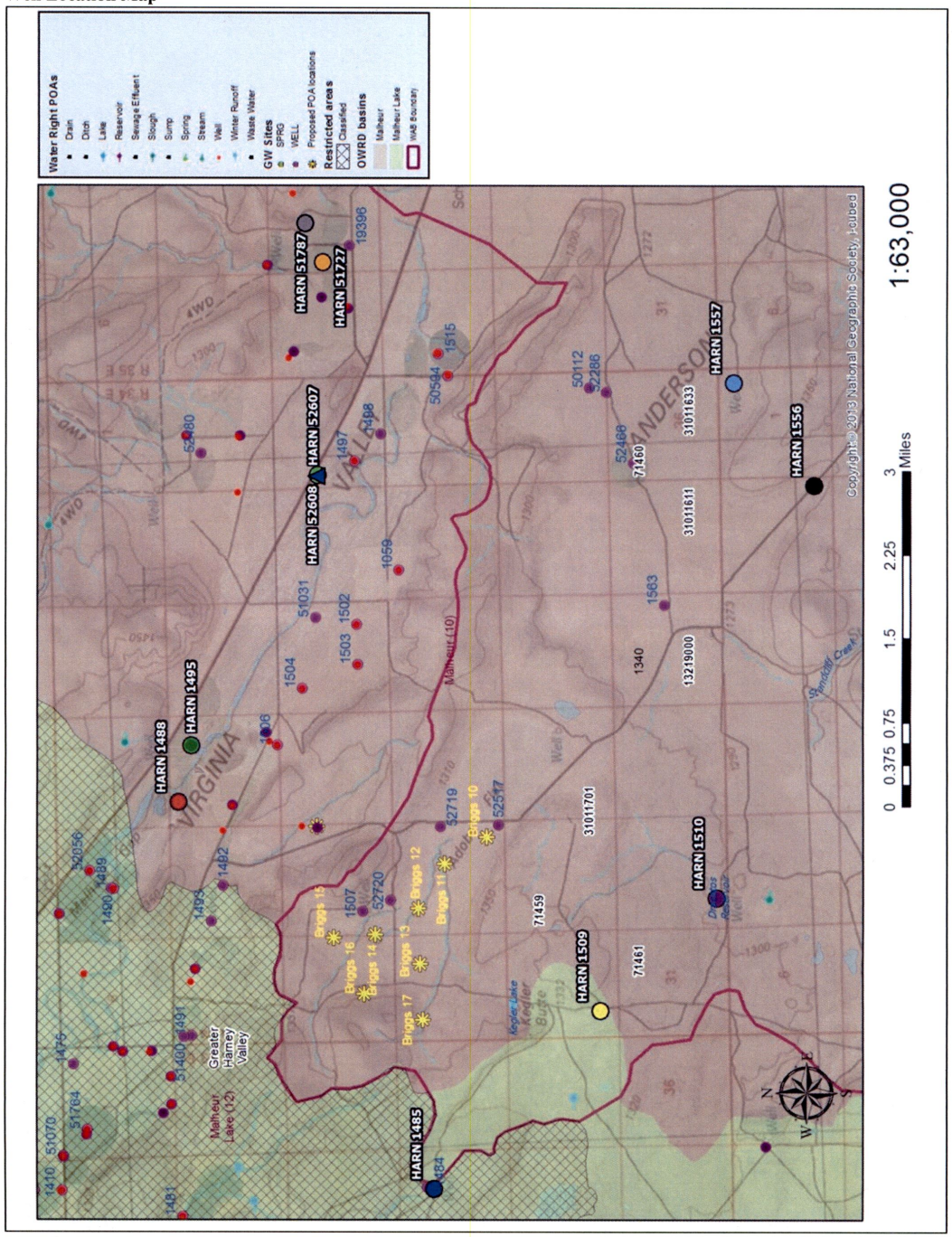
S FK MALHEUR R > MALHEUR R - AB INDIAN CR

Watershed ID #: 31011633 Basin: MALHEUR Exceedance Level: 80
Time: 11:03 AM Date: 04/15/2019

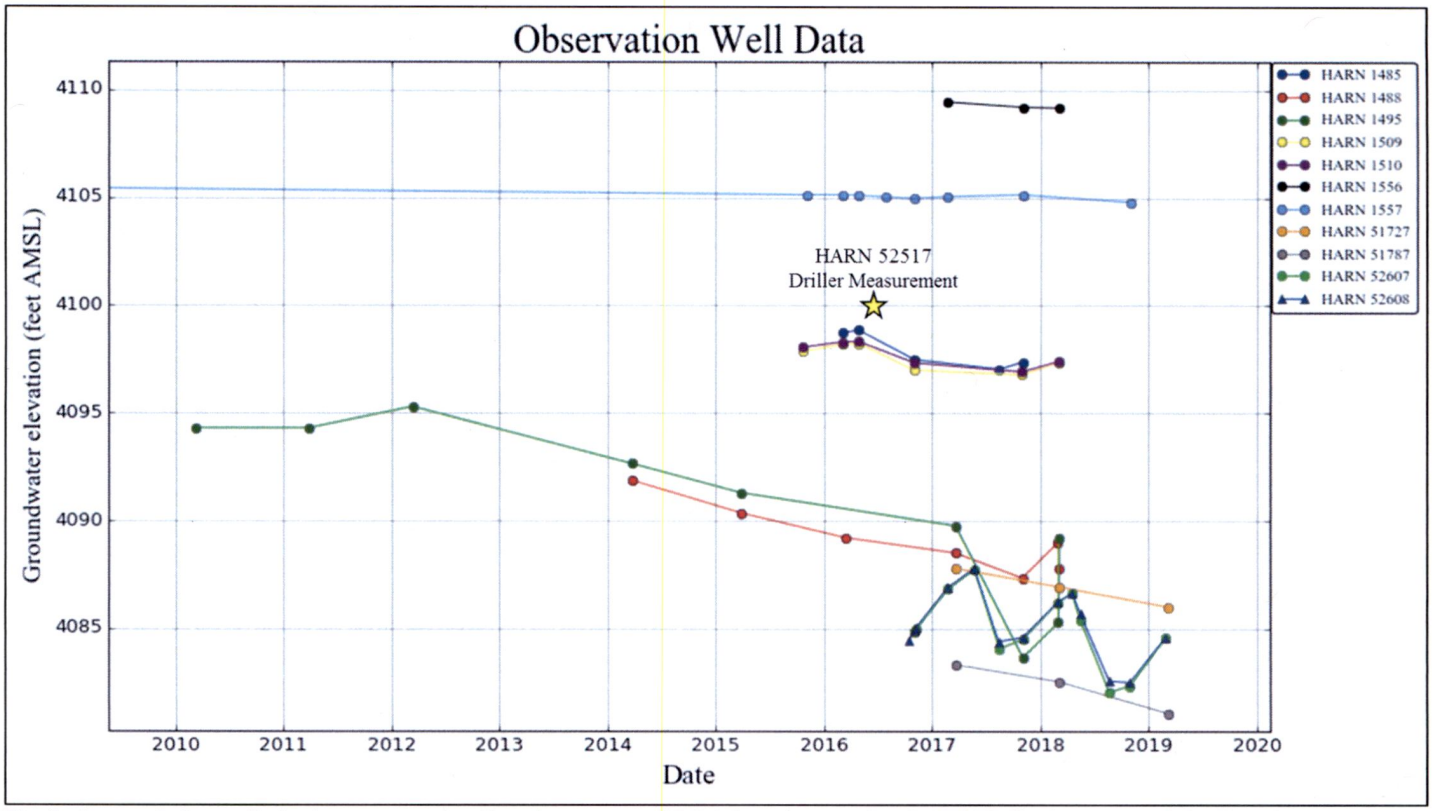
Monthly values are in cfs.
Storage is the annual amount at 50% exceedance in ac-ft.

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
JAN	0.75	0.02	0.73	0.00	0.00	0.73
FEB	1.64	0.07	1.57	0.00	0.00	1.57
MAR	3.62	0.15	3.47	0.00	0.00	3.47
APR	5.49	0.14	5.35	0.00	0.00	5.35
MAY	4.40	0.07	4.33	0.00	0.00	4.33
JUN	3.84	0.06	3.78	0.00	0.00	3.78
JUL	1.14	0.02	1.12	0.00	0.00	1.12
AUG	0.44	0.01	0.43	0.00	0.00	0.43
SEP	0.28	0.00	0.28	0.00	0.00	0.28
OCT	0.33	0.01	0.32	0.00	0.00	0.32
NOV	0.36	0.01	0.35	0.00	0.00	0.35
DEC	0.48	0.01	0.47	0.00	0.00	0.47
ANN	2,450	34	2,420	0	0	2,420

Well Location Map



Water-Level Trends in Nearby Wells



The hydrograph for wells in the area surrounding the proposed POA locations under G-17592 displays general declines in groundwater elevations (locations on map above). The steepest declines here are observed in the Virginia Valley to the north, where significant quantities of groundwater have been allocated. Declines are less severe in wells within the same WAB as the proposed POA wells (HARN 1485, HARN 1509, HARN 1510), but are noteworthy because there are currently no active groundwater rights within its boundaries.