Groundwater Application Review Summary Form

Application # G- 18753

GW Reviewer Phil Marcy **Date Review Completed:** 11/20/2018

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 20 ,2018

TO: **Application** G- 18753

FROM: **GW:** Phil Mauer
(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 11/20/2018

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

SUBJECT: Application G- 18753 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: **Otis Creek Ranch, LLC** County: **Harney**

A1. Applicant(s) seek(s) 3.91 cfs from 2 well(s) in the Malheur Basin, Otis Creek subbasin

A2. Proposed use Irrigation (172.3 acres); Supplemental Irrigation (141.0 acres) Seasonality: March 1st – October 1st (215 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	Jack Well	Bedrock	3.91	20S/36E-8 NW-NE	1030'S, 870'E fr N ¼ cor S 8
2	Proposed	Conley Well	Bedrock	3.91	19S/36E-31 NW-NW	260'S, 510'E fr NW cor S 31
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	3570	NA	NA	NA	720	0-476	0-476	Unknown	Unknown	NA	NA	NA
2	3669	NA	NA	NA	720	0-476	0-476	Unknown	Unknown	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** Nearby HARN 51953 appears to be the model for the proposed well construction of each of the proposed POAs (see attached chart), and has been measured under permit condition from 2015-2017. The most recent measurement on 11/28/2017 produced a water level elevation of 3683.79' AMSL.

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) **"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 **Fractured Bedrock** groundwater reservoir between approximately **450** ft. and **750** 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:** Considering available data, water levels do not show considerable, sustained declines. In the attached hydrograph, HARN 51953 (identical to proposed POA wells) reports stable water level elevations.

HARN 19, authorized under Certificate 44691, is the nearest groundwater POA to either proposed POA location, just over one mile to the northeast of proposed POA 2. This well also produces from volcanic deposits, but at much shallower depths, and is constructed with a seal extending only 20' below land surface, and communication between this and the proposed wells with a deep (476') case and seal is likely very inefficient.

Special Condition: A dedicated observation well shall be constructed and maintained by the permittee to assess the impacts of use of the permitted wells. When possible, drill cuttings for each production well drilled under this permit shall be collected at 10 foot intervals and at changes in lithology in the well, and a labeled split of each sampled interval shall be provided to the Department. The observation well shall be drilled at least 500 feet from either production well, shall be at least 6 inches in diameter, and shall be constructed to the same specifications and completed in the same aquifer as the production well. After the observation well is completed, Department staff shall be allowed access to the well to run video and geophysical logs, and to install and maintain automatic water level monitoring equipment.

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	**Fractured basalt and granite**	☒	☐
2	**Fractured basalt and granite**	☒	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Static water level elevations are hundreds of feet above the elevation of the water-bearing zone in the prototype well, HARN 51953, in addition to many nearby wells producing from volcanics beneath a thick succession of fine-grained sediment.

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**	**Warm Springs Creek**	**~3685**	**3544-3594**	**885**	☐	☒	☐	☐	☒
1	**1**	**Cottonwood Creek**	**~3685**	**3588-3602**	**3850**	☐	☒	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: Well 2 is not within one mile of perennial surface water. The elevation of groundwater in the deep, confined target aquifer is ~100' higher than land surface within one mile, with no mapped springs in the area.

Water Availability Basin the well(s) are located within: Otis Cr > Malheur R – At Mouth (POA 1); Otis Cr > Malheur R – AB Cottonwood Cr (POA 2)

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, POA wells shall be constructed to produce from only the fractured rock aquifer present at depths greater than 400' in most locations in this area, with continuous casing and seal placed through the overlying sedimentary sequence.

References Used:

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

Application review G-17669. Local well logs, OWRD water level reporting 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

OTIS CR > MALHEUR R - AT MOUTH

Watershed ID #: 31011637 Basin: MALHEUR Exceedance Level: 80
Time: 4:46 PM Date: 11/19/2018

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	1.13	2.25	-1.12	0.00	0.00	-1.12
FEB	6.32	7.42	-1.10	0.00	0.00	-1.10
MAR	20.00	19.20	0.79	0.00	0.00	0.79
APR	35.40	27.80	7.60	0.00	0.00	7.60
MAY	12.60	25.90	-13.30	0.00	0.00	-13.30
JUN	6.20	17.10	-10.90	0.00	0.00	-10.90
JUL	1.09	5.28	-4.19	0.00	0.00	-4.19
AUG	0.31	2.08	-1.77	0.00	0.00	-1.77
SEP	0.20	1.06	-0.86	0.00	0.00	-0.86
OCT	0.19	0.62	-0.43	0.00	0.00	-0.43
NOV	0.45	0.44	0.01	0.00	0.00	0.01
DEC	0.86	0.97	-0.11	0.00	0.00	-0.11
ANN	11,900	6,640	6,000	0	0	6,000

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

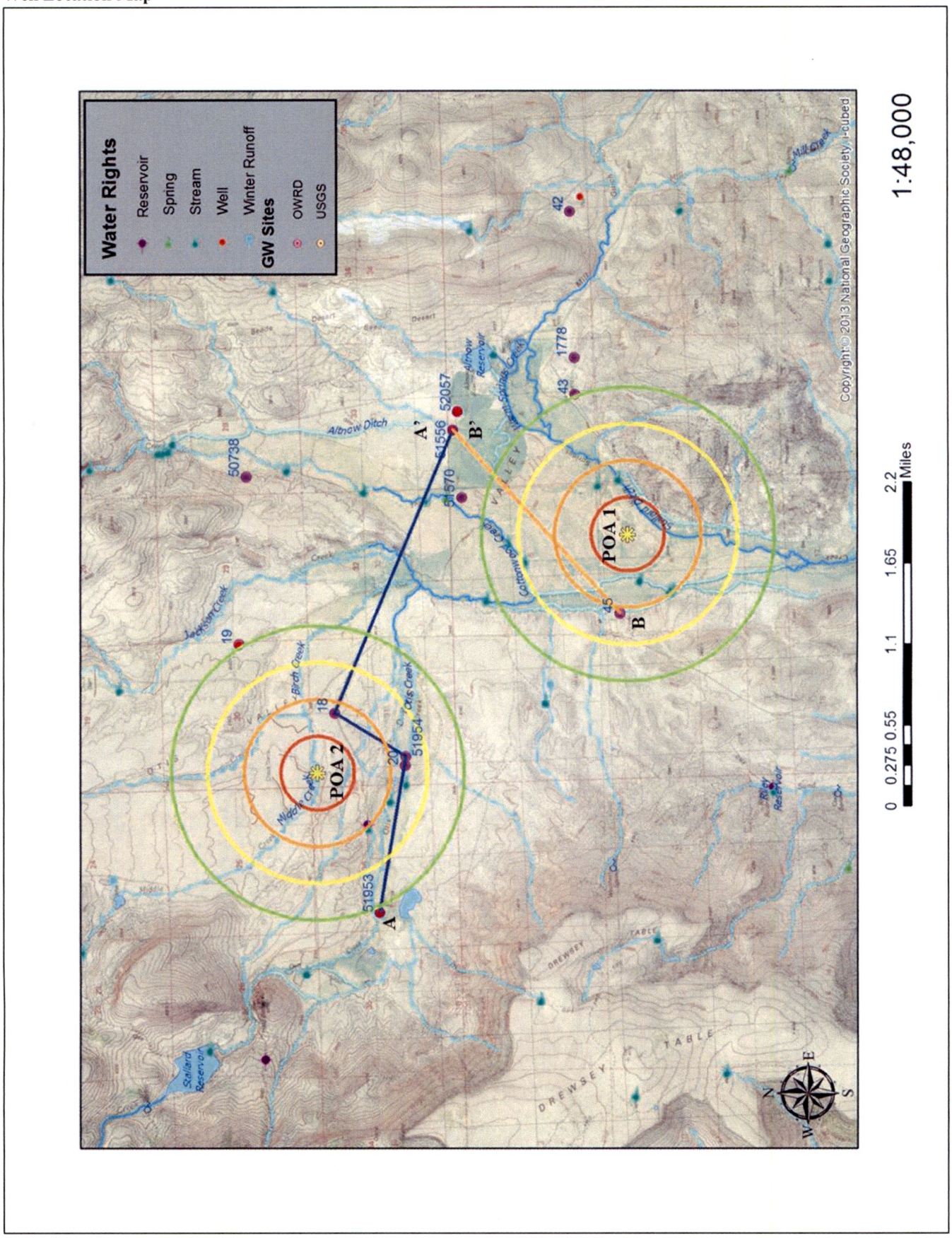
OTIS CR > MALHEUR R - AB COTTONWOOD CR

Watershed ID #: 31011640 Basin: MALHEUR Exceedance Level: 80
Time: 4:47 PM Date: 11/19/2018

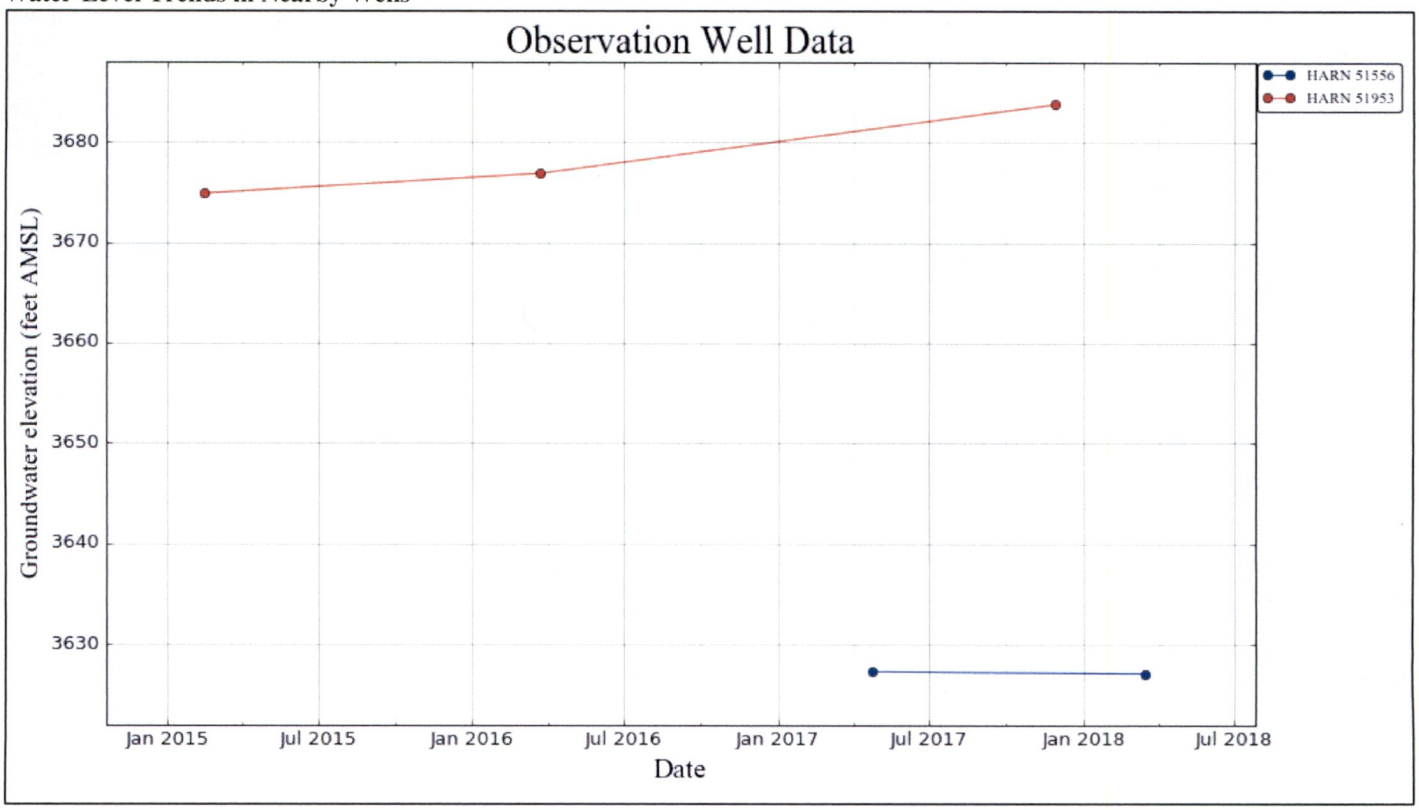
Monthly values are in cfs.
Storage is the annual amount at 50% exceedance in ac-ft.

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
JAN	0.60	0.07	0.53	0.00	0.00	0.53
FEB	2.15	0.18	1.97	0.00	0.00	1.97
MAR	3.54	0.74	2.80	0.00	0.00	2.80
APR	4.60	2.41	2.19	0.00	0.00	2.19
MAY	3.49	5.68	-2.19	0.00	0.00	-2.19
JUN	2.06	4.57	-2.51	0.00	0.00	-2.51
JUL	0.41	1.52	-1.11	0.00	0.00	-1.11
AUG	0.13	0.62	-0.49	0.00	0.00	-0.49
SEP	0.07	0.32	-0.25	0.00	0.00	-0.25
OCT	0.06	0.16	-0.10	0.00	0.00	-0.10
NOV	0.22	0.02	0.20	0.00	0.00	0.20
DEC	0.45	0.04	0.41	0.00	0.00	0.41
ANN	2,690	989	1,860	0	0	1,860

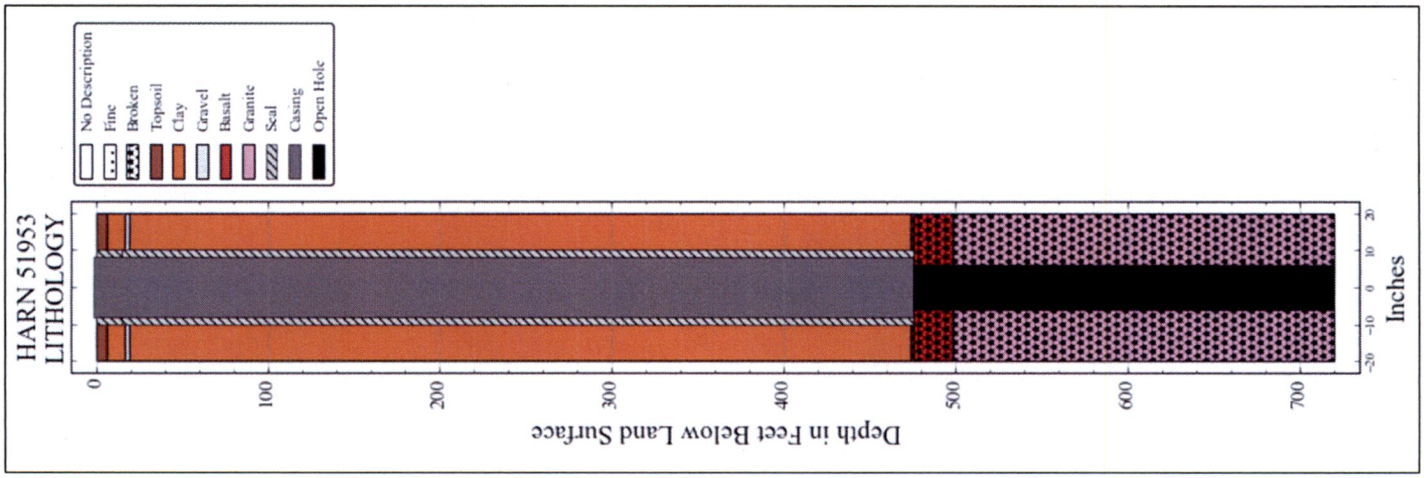
Well Location Map



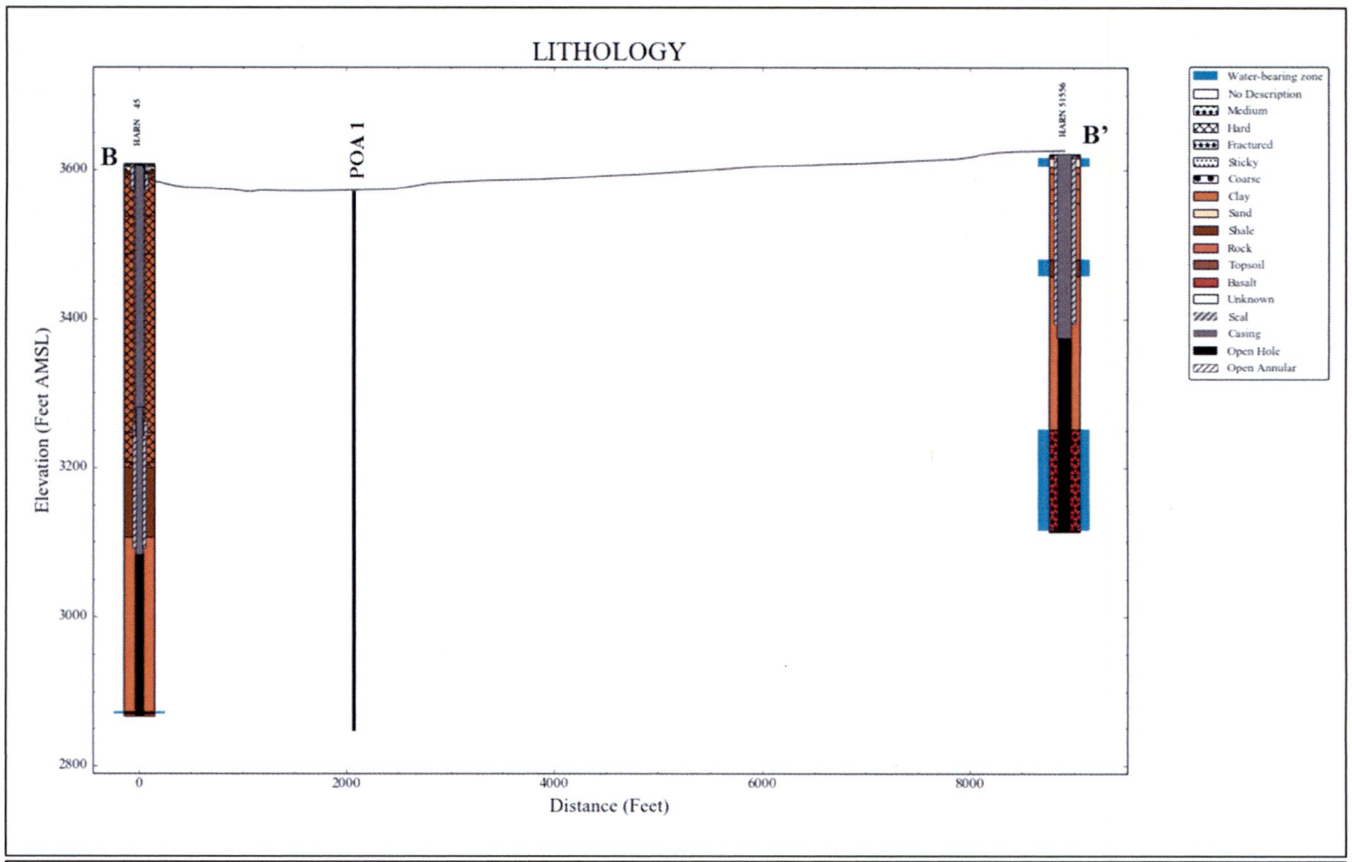
Water-Level Trends in Nearby Wells

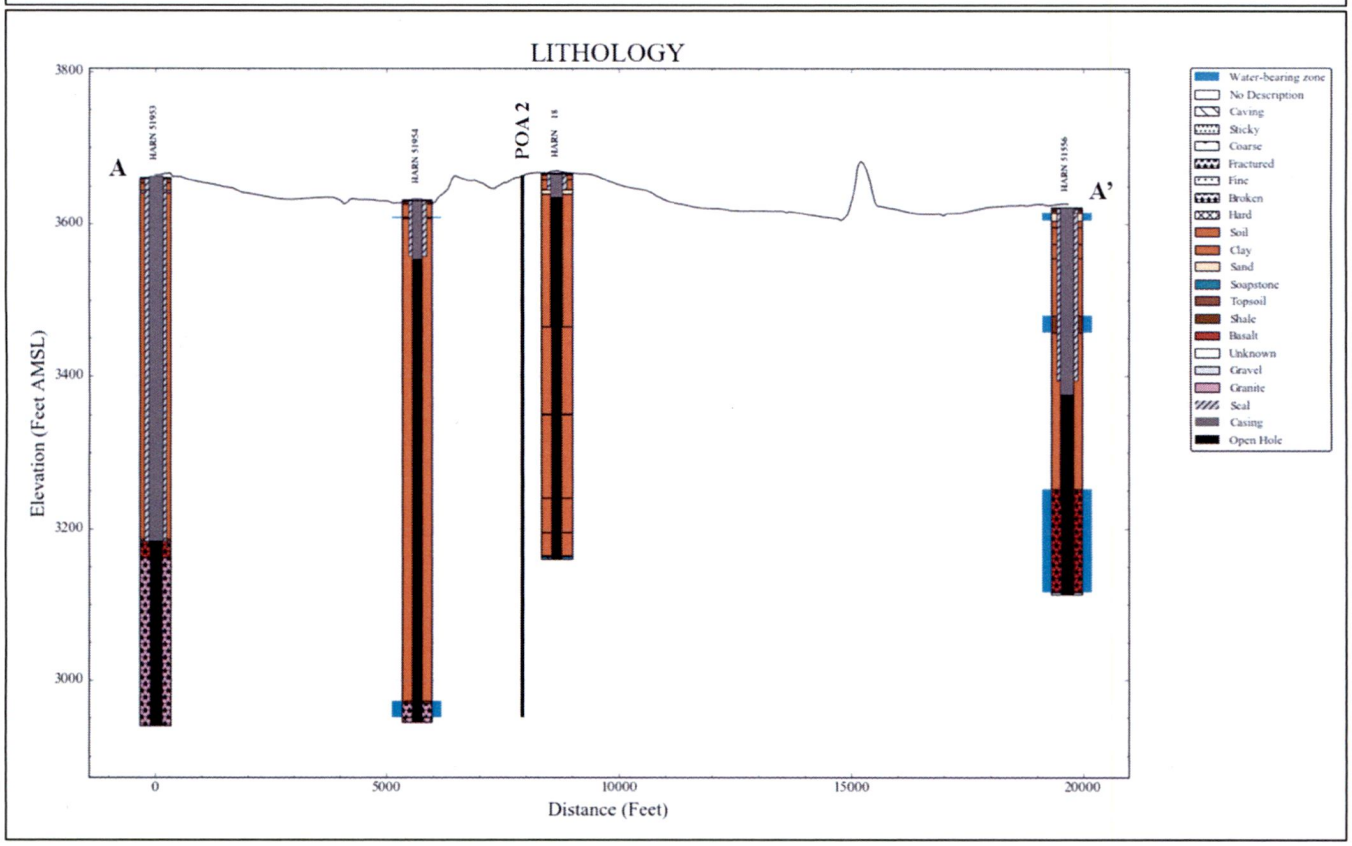


Nearby wells producing from deep water-bearing zones display stable water levels, but the record is very short.



HARN 51953 reported lithology and construction diagram. Well is constructed to produce only from fractured basalt and intrusive volcanic rock at depth, with continuous case and seal through sedimentary sequence. Both POA wells on this application propose construction that is identical to this well.


LITHOLOGY
B
B'
POA 1
HARN 45
HARN 51556
Elevation (Feet AMSL)
3600
3400
3200
3000
2800
0
2000
4000
6000
8000
Distance (Feet)
Water-bearing zone
No Description
Medium
Hard
Fractured
Sticky
Coarse
Clay
Sand
Shale
Rock
Topsoil
Basalt
Unknown
Seal
Casing
Open Hole
Open Annular


LITHOLOGY
A
A'
POA 2
HARN 51953
HARN 51954
HARN 18
HARN 51556
Elevation (Feet AMSL)
3800
3600
3400
3200
3000
0
5000
10000
15000
20000
Distance (Feet)
Water-bearing zone
No Description
Caving
Sticky
Coarse
Fractured
Fine
Broken
Hard
Soil
Clay
Sand
Soapstone
Topsoil
Shale
Basalt
Unknown
Gravel
Granite
Seal
Casing
Open Hole