

Groundwater Application Review Summary Form

Application # G- 19236

GW Reviewer Phillip I. Marcy Date Review Completed: 06/17/2024

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

06/17/2024

TO: **Application G- 19236**

FROM: **GW: Phillip I. Marcy**
 (Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

YES The source of appropriation is hydraulically connected to a State Scenic
 NO Waterway or its tributaries

YES
 NO Use the Scenic Waterway Condition (Condition 7J)

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 [Enter] 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

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 well is located in an area underlain by Mesozoic rocks, including Clover Creek Greenstone and granites of the Wallowa Terrane (Brooks, 1976). Outcrops of Miocene aged volcanic rocks of the Powder River Volcanics (PRV) are sparsely distributed at land surface but appear to extend beneath the sedimentary sequence, as interpreted from nearby driller's logs and produce moderate quantities of groundwater, owing to their typically thin flow interiors compared to the thickness of relatively more permeable interflow zones. In some locations, volcanic rocks are reported immediately above intrusive granites, resulting from an apparent erosional unconformity in the area (see attached cross-section). In the immediate area of the proposed well, it is unknown whether PRV exists above the Mesozoic sequence of greenstone and granite, both of which have typically poor yields with groundwater movement limited by the presence or absence of secondary fractures. It is unlikely that a single well completed into bedrock at this location will produce the requested rate based upon these factors.

Based upon available data and the resulting conceptual model of the local hydrogeologic framework described below, it is anticipated that permeable bedrock at this location will be in reasonably efficient connection with nearby surface water. Due to the increasing frequency of surface water regulation (personal communication with East Region staff, 2021), further appropriation of groundwater connected to surface water is expected to contribute to increased regulation as surface water availability dwindles.

Available water level data from nearby wells producing from granitic aquifers display vastly differing water level elevations and water level trends. Taken together, these observations suggest that in some areas the granitic aquifers are efficiently connected to the surrounding unconfined aquifer system and other places not. Wells that do not appear hydraulically connected to surface water, based upon steady observed declines, largely do not correspond in terms of elevation or decline

trends, which suggests that there is poor, if any, connection between wells producing from granite in the area of proposed development. Therefore, since locally observed declines cannot be positively tied to expected behavior at the proposed POA well, and therefore qualify as “same source”, it does not appear appropriate to reach a finding of “over-appropriated” for the proposed use. However, if the proposed POA achieves the result of producing exclusively from an unconnected portion of the granitic aquifer system, available data from nearby wells completed within granite suggest that declines may become excessive once use has begun, and therefore not within the capacity of the resource.

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	Powder Volcanics or Clover Ck. Greenstone	<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"/>

Basis for aquifer confinement evaluation: Wells of similar depth report static water level elevations on driller’s logs well above the elevations of the respective water-bearing 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	3250-3270	3242-3250	1520	<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"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: The geologic setting is largely composed of erosional remnants of Miocene volcanic rocks overlying low permeability Mesozoic metavolcanic and intrusive rocks. Miocene PRV rocks typically have reasonably high horizontal permeability and much lower vertical permeability, due to the presence of dense internal horizons in many flows. However, due to the highly eroded and incised nature of the remaining lavas, hydraulic connection to surrounding materials is anticipated due to truncation of any barrier to groundwater movement to or from nearby surface water sources.

Water Availability Basin the well(s) are located within: POWDER R > SNAKE R - AB UNN STR

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 (SW) source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that SW source, 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	1	<input type="checkbox"/>	<input type="checkbox"/>	IS72191A	25.0	<input checked="" type="checkbox"/>	70.3	<input checked="" type="checkbox"/>	<25%	<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"/>
		<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"/>

Comments: The limitations of instream water right IS7219 on this reach of the Powder River limit appropriations of hydraulically connected groundwater to 0.25 CFS between ¼ mile and 1 mile.

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													
(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:** If a permit is issued, the permit shall include a condition to collect cuttings during construction of the well whenever possible. The drill cuttings shall be collected at 10-foot intervals in addition to changes in lithology with each sample labeled with a well identifier and the depth collected from. A split of each sample shall be provided to the department upon completion of the POA well.

This proposed use has the Potential to Substantially Interfere (PSI) with local surface water sources due to the proposed well location and hydraulic connectivity between bedrock and the sedimentary sequence locally. The maximum allocation allowable at a distance of less than one mile from surface water is 0.2 CFS in the Water Availability Basin (WAB) where the proposed POA is located.

References Used: Local well logs, GWIS groundwater database

Brooks, H.C., McIntyre, J.R., Walker, G.W., 1976, Geology of the Oregon part of the Baker 1 degree by 2 degree quadrangle. Geologic Map Series GMS-7, Oregon Department of Geology and Mineral Industries, Portland, OR., map scale 1:250,000.

Iverson, J., 2023. Clarification of current policy for determining over-appropriation in section B1a of the PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS: Internal Memorandum to Groundwater Staff.

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:** _____

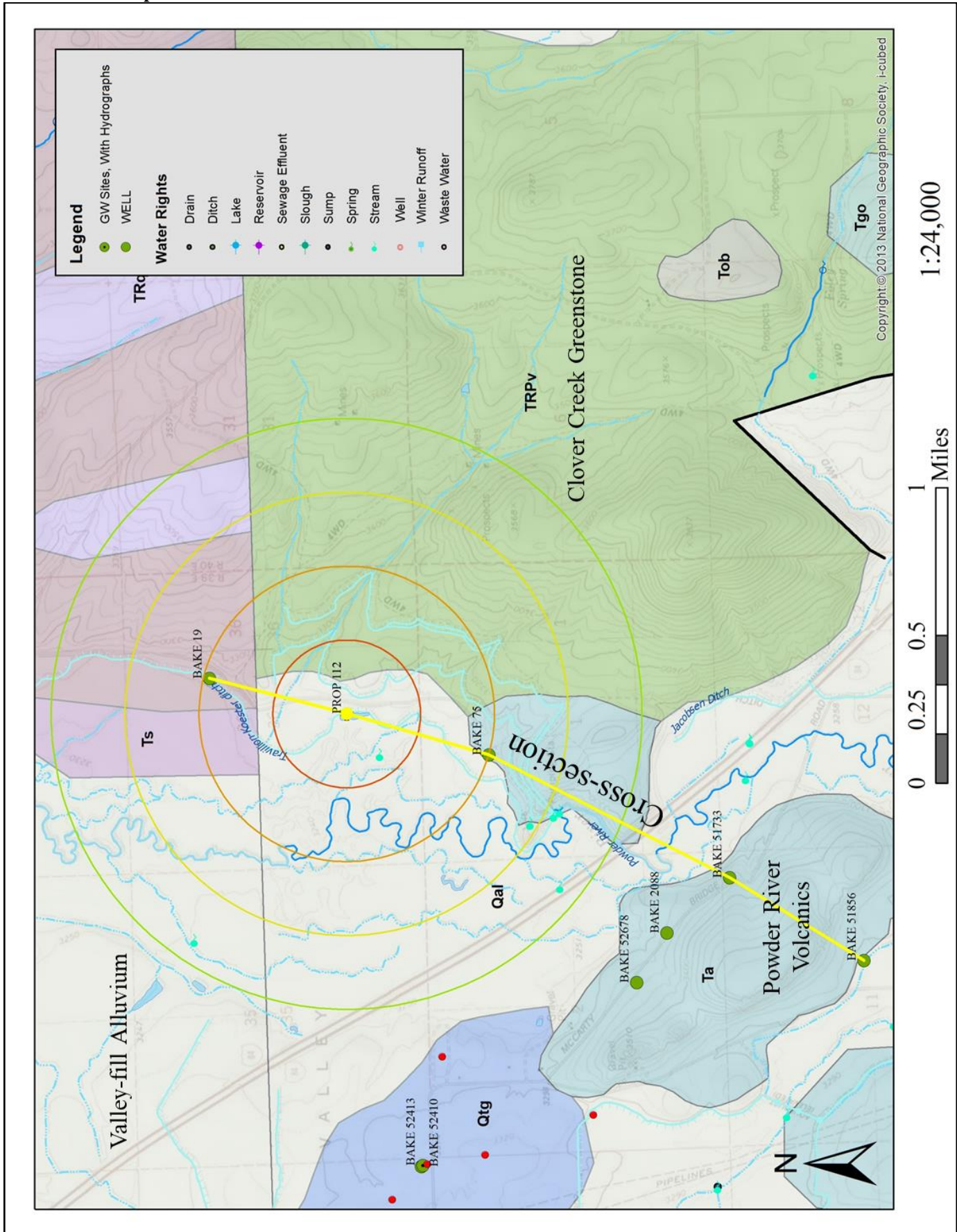
D4. **Route to the Well Construction and Compliance Section for a review of existing well construction.**

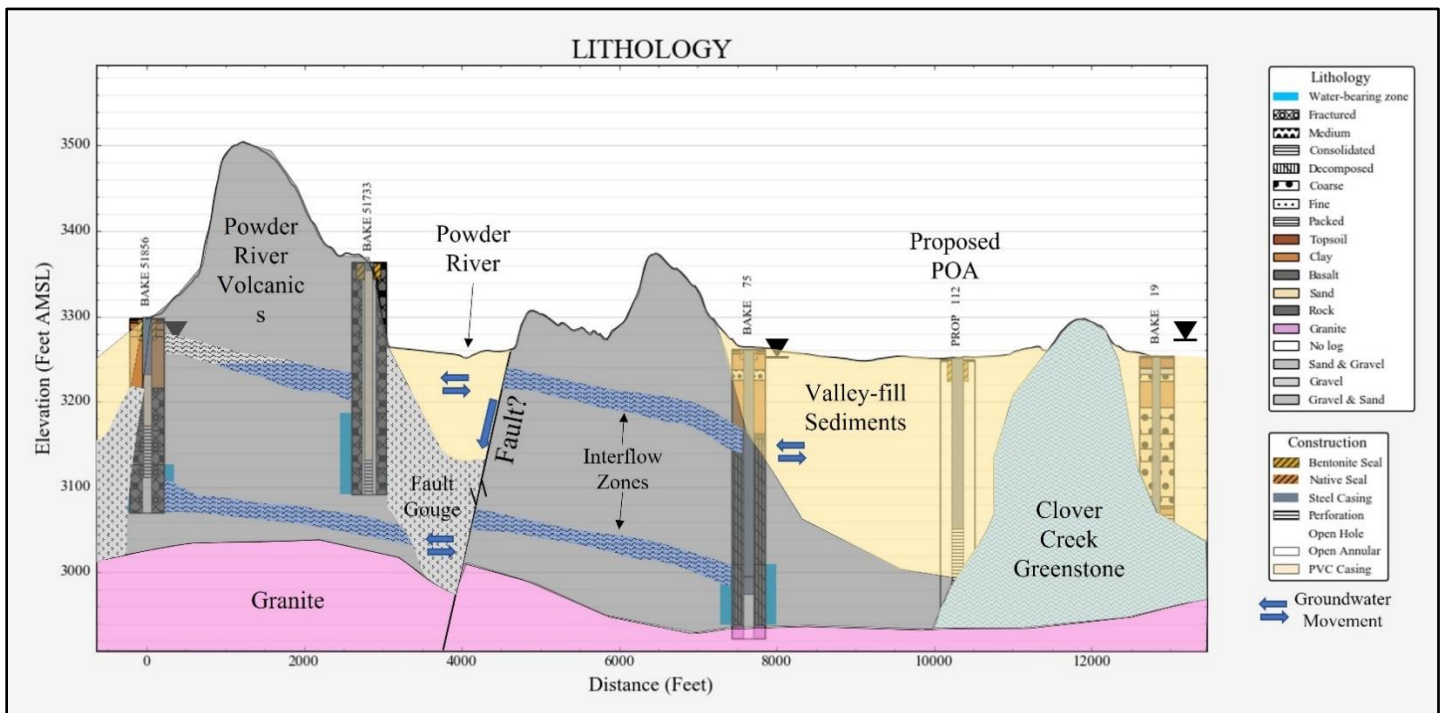
Water Availability Tables

POWDER R > SNAKE R - AB UNN STR						
Watershed ID #: 72191		Basin: POWDER			Exceedance Level: 80	
Time: 2:13 PM					Date: 01/11/2022	
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	65.90	89.00	-23.10	6.37	25.00	-54.50
FEB	103.00	108.00	-5.34	20.60	30.00	-56.00
MAR	203.00	193.00	10.20	61.60	40.00	-91.40
APR	456.00	353.00	103.00	251.00	40.00	-188.00
MAY	714.00	843.00	-129.00	140.00	40.00	-309.00
JUN	593.00	995.00	-402.00	0.00	40.00	-442.00
JUL	204.00	529.00	-325.00	0.00	25.00	-350.00
AUG	107.00	313.00	-206.00	0.00	25.00	-231.00
SEP	72.70	240.00	-167.00	0.00	25.00	-192.00
OCT	70.30	91.40	-21.10	4.67	25.00	-50.80
NOV	75.10	71.30	3.82	5.56	25.00	-26.70
DEC	77.90	82.90	-5.00	6.14	25.00	-36.10
ANN	241,000	236,000	47,000	29,900	22,000	5,290

DETAILED REPORT OF INSTREAM REQUIREMENTS													
POWDER R > SNAKE R - AB UNN STR												Basin: POWDER	
Watershed ID #: 72191												Date: 01/11/2022	
Time: 2:26 PM													
Application Number	Status	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Monthly values are in cfs.													
IS72191A	APPLICATION	25.0	30.0	40.0	40.0	40.0	40.0	25.0	25.0	25.0	25.0	25.00	25.0
MAXIMUM		25.0	30.0	40.0	40.0	40.0	40.0	25.0	25.0	25.0	25.0	25.0	25.0

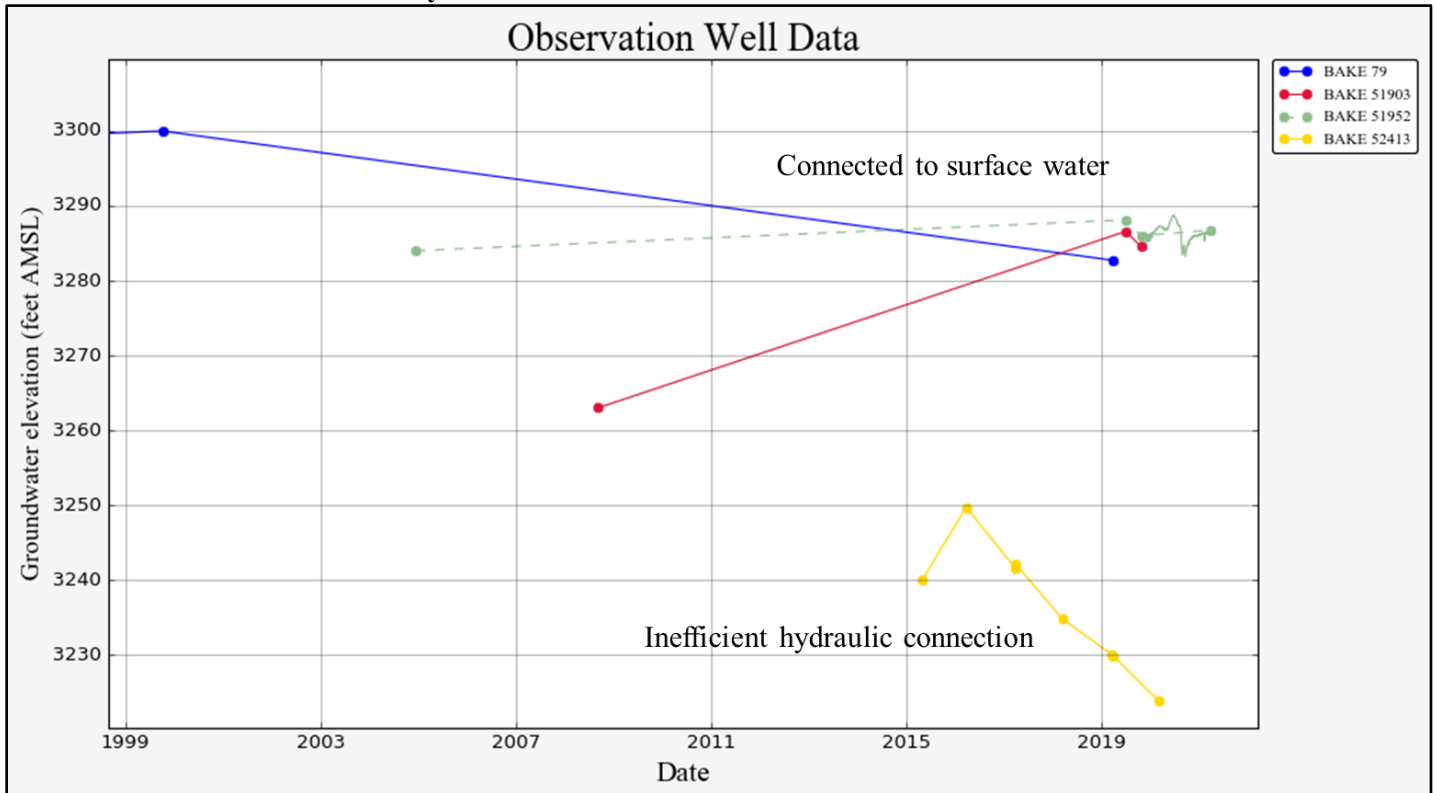
Well Location Map





Idealized cross-section for the area of proposed development depicts our conceptual model of the relationship between mapped lithologies (Brooks, 1976) and those reported on driller’s logs. Erosional remnants of Powder River Volcanics in places directly overlay granite, while in other locations is likely that “rock” or “basalt” are used interchangeably and may indicate either Miocene volcanic or Mesozoic metasedimentary rock (Clover Creek Greenstone). Interflow zones in volcanic flow rocks are relatively permeable and produce moderately high yields to nearby wells, while dense flow interiors have very low permeability. In cases where volcanic sequences are laterally extensive and the sequence remains intact, aquifers housed in interflow zones can display high degrees of isolation from surface water and adjacent aquifers, as evidenced by water level trends that diverge from both adjacent aquifers and seasonal patterns of surface recharge. Considering the available evidence, interflow zones within the volcanic sequence here are likely highly dissected by erosion and offset by faulting, in turn creating efficient pathways for groundwater to move to and from these aquifer zones and adjacent unconfined surficial aquifers.

Water-Level Measurements in Nearby Wells



Recent water level data are sparse for the area of interest, but two distinct trends illustrate the impact of hydraulic connection to surface water in addition to providing evidence that the degree of connectivity is largely controlled by local geologic structure. The three wells with water levels between 3,280 and 3,290 feet AMSL have remained fairly stable over the period of record and display seasonal changes in the continuous record of BAKE 51952 (below). Like BAKE 51952, BAKE 52413 is also constructed to produce from fractured zones within granite but displays much different behavior. The year-upon-year declines reported in this well illustrate limited recharge to this aquifer, thus lack of hydraulic connection to surface water. The difference between these two situations is likely the degree to which fractures in bedrock are connected to adjacent aquifer materials in the adjacent sedimentary sequence.

