Groundwater Application Review Summary Form

Application # G- 19408

GW Reviewer Phillip I. Marcy Date Review Completed: 01/12/2024

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 **_January 12, 2024_**

TO: **Application** G-**_19408_**

FROM: **GW:** **_Phillip I. Marcy_**
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ **YES**
☒ **NO** The source of appropriation is hydraulically connected to a State Scenic 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

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 01/12/2024

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

SUBJECT: Application G- **19408** 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: **Dyke Properties, LLC** County: **Baker**

A1. Applicant(s) seek(s) 2.5 cfs from 2 well(s) in the Powder Basin, _____ subbasin

A2. Proposed use Supplemental Irrigation (563 acres) Seasonality: March 1st – September 30th (214 days)

A3. Well and aquifer data **(attach and number logs for existing wells; mark proposed wells as such under logid)**:

POA 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	2.50	7S/38E-11 NW-SE	1090'S, 1265'E fr C1/4 cor S 11
2	Proposed	2	Alluvium	2.50	7S/38E-11 NW-SE	1110'S, 1204'E fr C1/4 cor S 11
3						
4						

* Alluvium, CRB, Bedrock

POA Well	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Drawdown (ft)	Test Type
1	300	0-150	0-150	Unknown	150-300	NA	NA	None
2	300	0-150	0-150	Unknown	150-300	NA	NA	None
3								
4								

POA Well	Land Surface Elevation at Well (ft amsl)	Depth of First Water (ft bls)	SWL (ft bls)	SWL Date	Reference Level (ft bls)	Reference Level Date
1	3486	NA	NA	NA	NA	NA
2	3488	NA	NA	NA	NA	NA
3						
4						

Use data from application for proposed wells.

A4. **Comments:** The applicant proposes to develop groundwater from deeper portions of the alluvial sequence for purposes of supplemental irrigation of 563 acres authorized under Certificates 73997 (40 acres) and 73998 (523 acres). If a permit is issued, reference levels should be set at the groundwater elevation measured before use of either well begins.

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) **7RLN; 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:** Permit condition measurements from nearby wells indicate relatively small declines in recent years (see attached hydrograph and map). The position of these and the proposed POA wells in this application are on the bajada along the western side of the Baker Valley, producing from coalescing alluvial fan materials. Hydraulic connection to nearby wells located along the slope of the fan may be highly variable, depending on the orientation and geometry of coarse-grained channel facies at depth, and is typically limited while impacts are inevitably felt downgradient as groundwater that would inevitably reach the valley floor is intercepted by pumping at these locations. Therefore, excessive interference with nearby groundwater rights in not anticipated.

Notable in the observation well data is that wells higher on the alluvial fan display greater declines year upon year than wells near the valley floor. This indicates that the gradient, and thus the volume of groundwater flowing toward the valley has been reduced in recent years according to our conceptual model. While the current dataset may not be sufficient to establish the cause of these declines or the period over which they have occurred, it does establish a need for caution going forward, as once all rights issued in this area are developed, declines are likely to increase and groundwater shortages are likely to be exacerbated.

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	**Alluvial Fan Sediments**	☐	☒
2	**Alluvial Fan Sediments**	☐	☒
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Nearby wells at similar positions across the alluvial fan deposits report water level elevations similar to that where groundwater was first encountered within the borehole.

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**	**~3450**	**3416**	**5175**	☒	☐	☐	☐	☒
2	**1**	**Warm Springs Creek**	**~3450**	**3416**	**5230**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Groundwater elevations in the vicinity of the proposed development roughly mimic surface topography, and as the water table approaches the valley floor the hydrologic gradient shallows and groundwater begins to discharge where the piezometric surface intercepts land surface. Due to the nature of alluvial fan deposits, there are no known laterally continuous barriers to groundwater migration toward land surface.

Water Availability Basin the well(s) are located within: POWDER R > SNAKE R - AB UNN STR (ID # 72191)

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**	☐	☐	**IS72191 A**	**25.0**	☒	**70.3**	☒	**<<25%**	☒
2	**1**	☐	☐	**IS72191 A**	**25.0**	☒	**70.3**	☒	**<<25%**	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: The proposed maximum rate is greater than 1% of the instream water right IS72191A and greater than 1% of the 80% exceedance rate in the given WAB, therefore triggering Potential to Substantially Interfere (PSI) with surface water within one mile. The highest rate permitted within one mile of surface water at the proposed location is 0.25 CFS. Interference with surface water after 30 days is anticipated to be much less than 25% of the total pumping rate, due to the distance of nearly one mile, the depth of the proposed open interval in the proposed POA wells, and the relatively high storativity anticipated within the unconfined aquifer. Despite the minimal effects to surface water in the short-term, however, long-term continued pumping from the materials within the alluvial fan sequence will directly reduce the volume of groundwater moving toward the valley floor and the Powder River, as the gradient toward the valley continues to shallow.

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:** The nature of the alluvial fan deposits proposed for development is heterogeneous at small scales, with fine and coarse materials randomly distributed as a result of frequently migrating stream channels across the face of the alluvial fans. The result of this geometry is that groundwater follows preferential flow paths downslope in lenses and stringers of coarse-grained material whose locations are not detectable at land surface. In wells in the higher portions of these fan deposits, groundwater is either at or below the elevation at which water-bearing lithologies are encountered within boreholes, indicating that these are generally recharge zones with downward movement of groundwater and that any streams located at these elevations are losing reaches. Closer to the bottom of the alluvial fans, groundwater typically begins to discharge at the surface due to the head elevation being higher than land surface, and surface water drainages here become gaining reaches, often perennial streams. Seeps and springs are observed in this discharge zone where preferential flow paths meet the fan surface. The complete picture therefore is one where water entering the system from the bedrock surface marking the valley wall is inevitably discharged at or near the bottom of the alluvial fan through a complex network of interconnected paleochannels over variable lengths of time, depending on the geometry and relationships between these paleochannels. Therefore, though groundwater pumped from higher portions of the alluvial fan may not be directly connected to surface water in the area of the well, any water produced here is intercepted from what would inevitably discharge downslope to the valley-fill sequence and surface water bodies occupying the valley floor.

References Used:

OWRD Ground Water Report #6; Ground Water Resources of Baker Valley, Baker County, Oregon, by Frederick D. Trauger, 1951.

Brooks, Geology of the Oregon Part of the Baker 1º by 2º Quad, 1976.

Spearing, D.A., Alluvial Fan Deposits. Geological Society of America Summary Sheets of Sedimentary Deposits, sheet 1, 1974.

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: 10:08 AM Date: 01/10/2024

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	-5.35	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

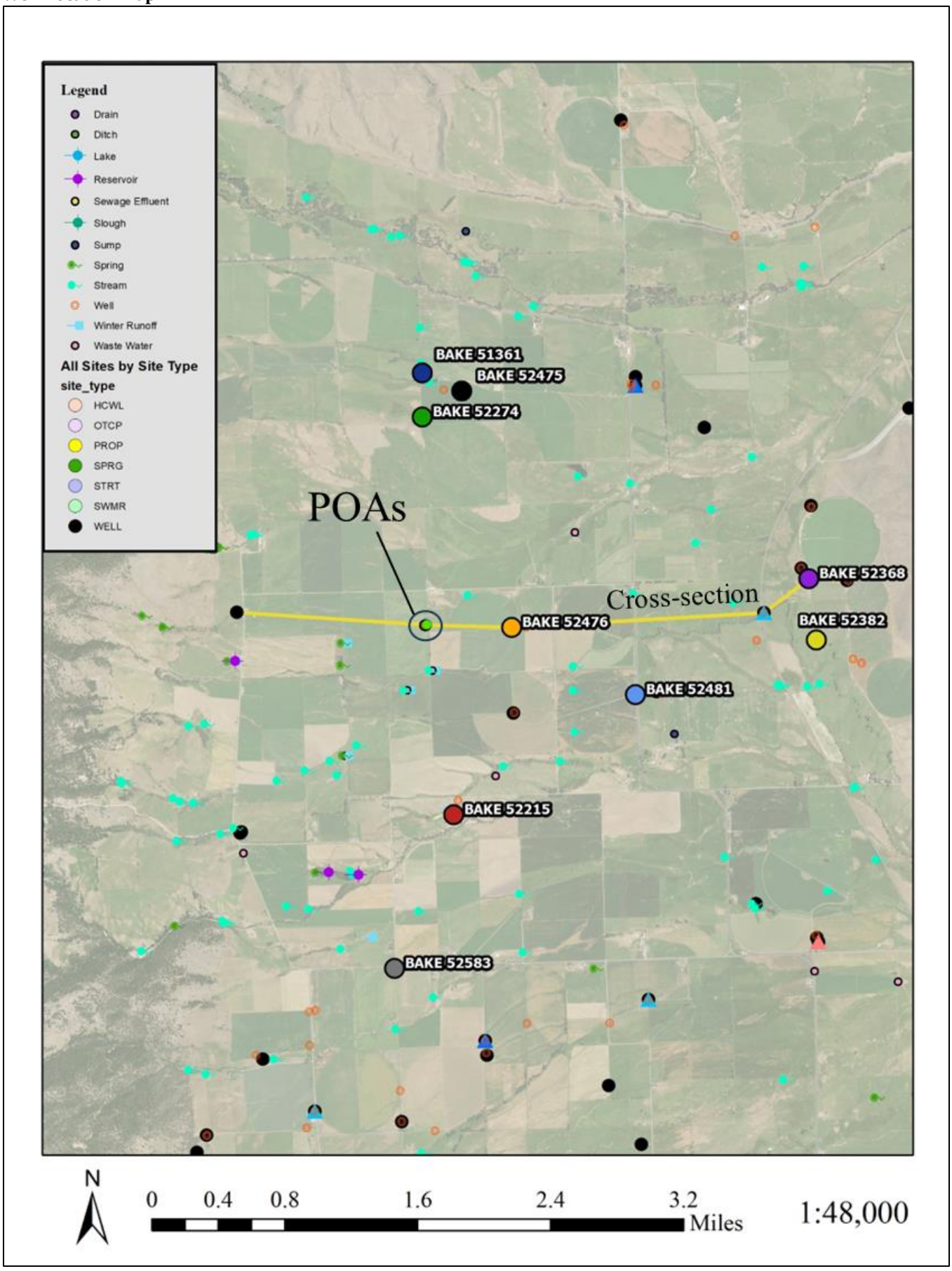
POWDER R > SNAKE R - AB UNN STR

Watershed ID #: 72191 Basin: POWDER

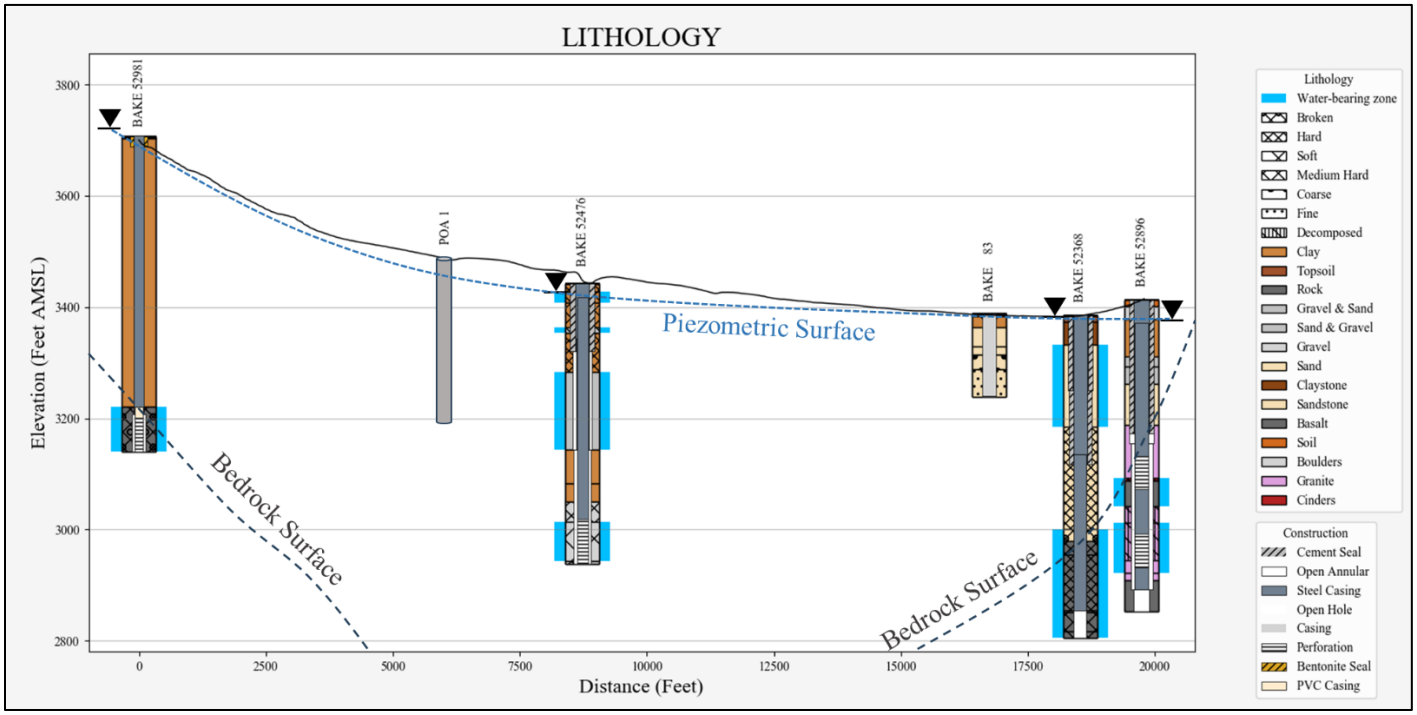
Time: 10:09 AM Date: 01/10/2024

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



Cross-Section



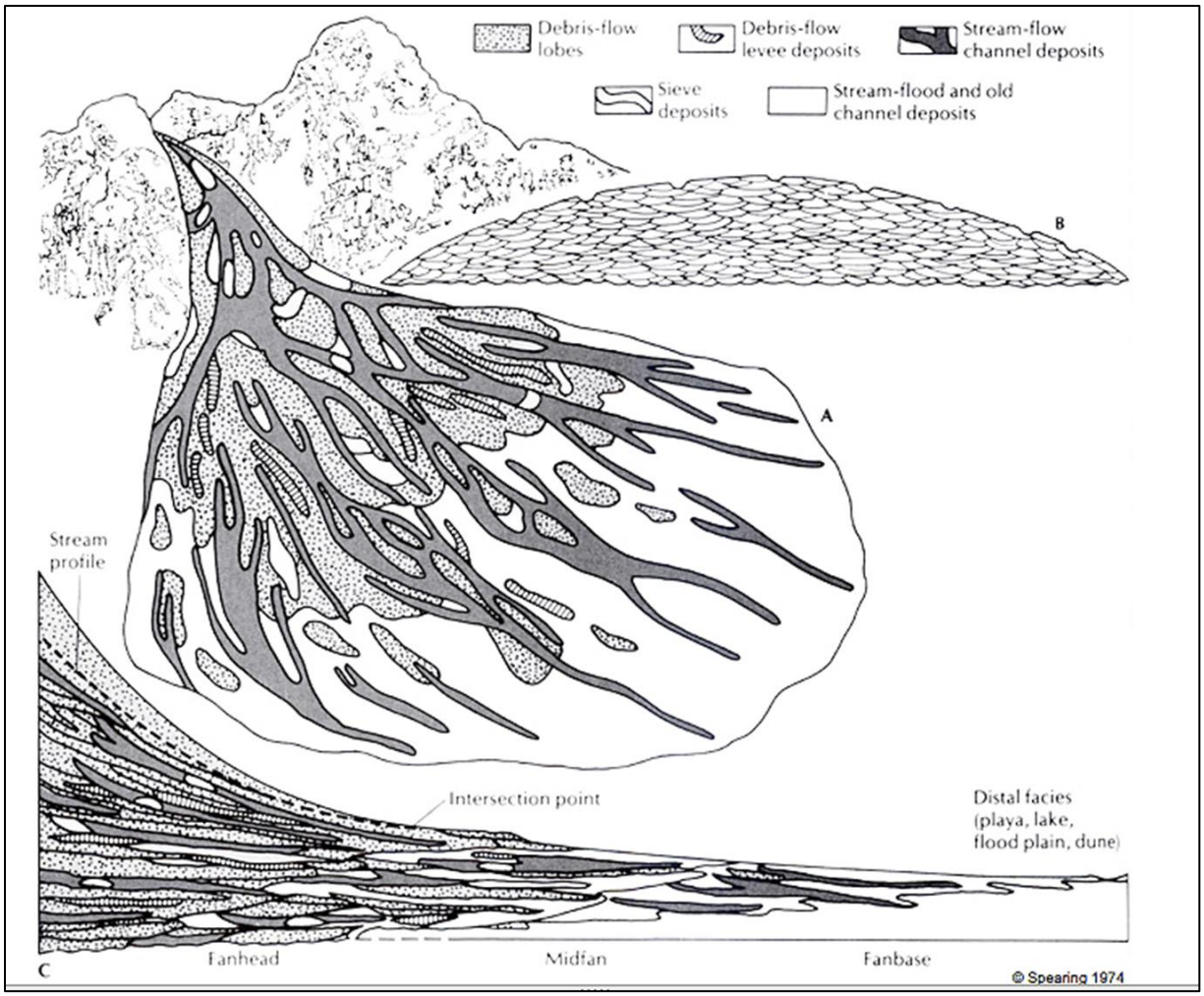
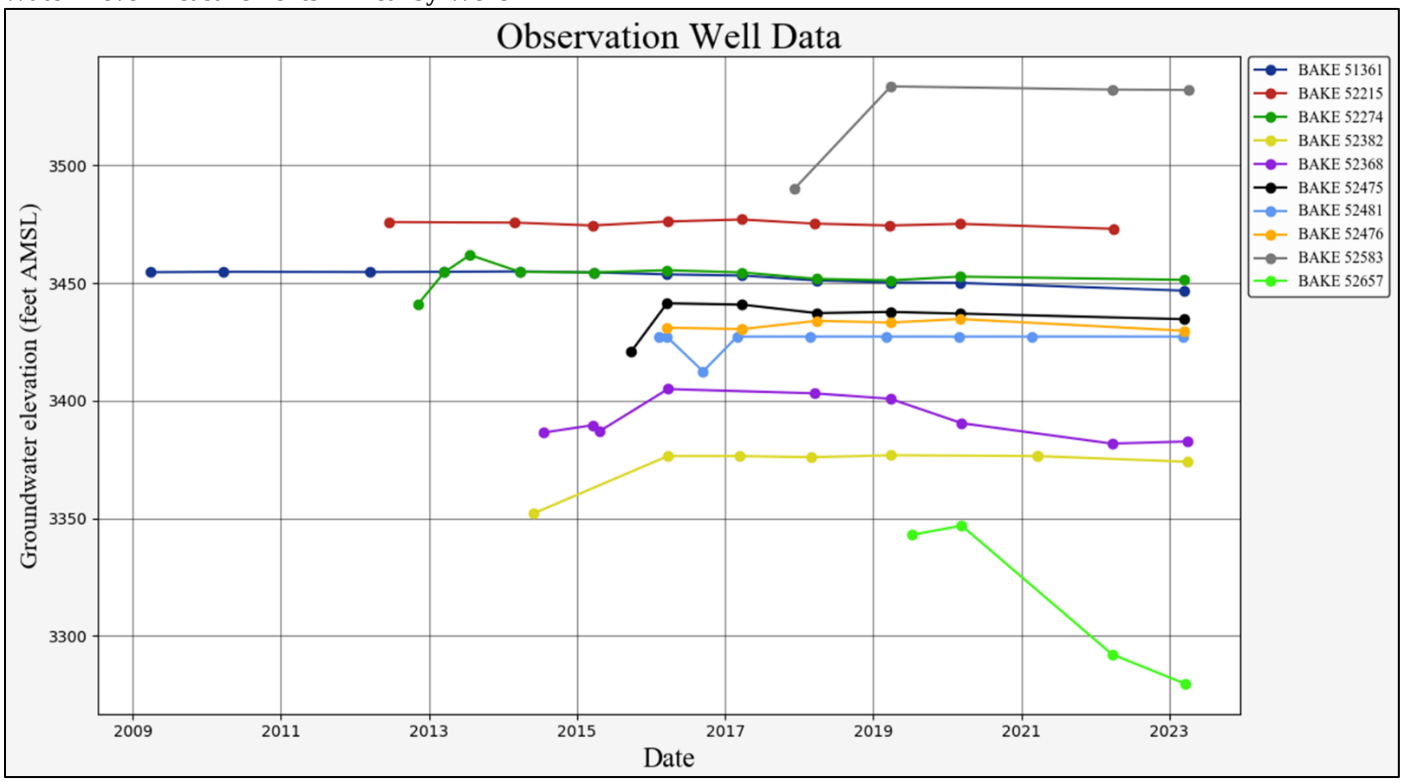
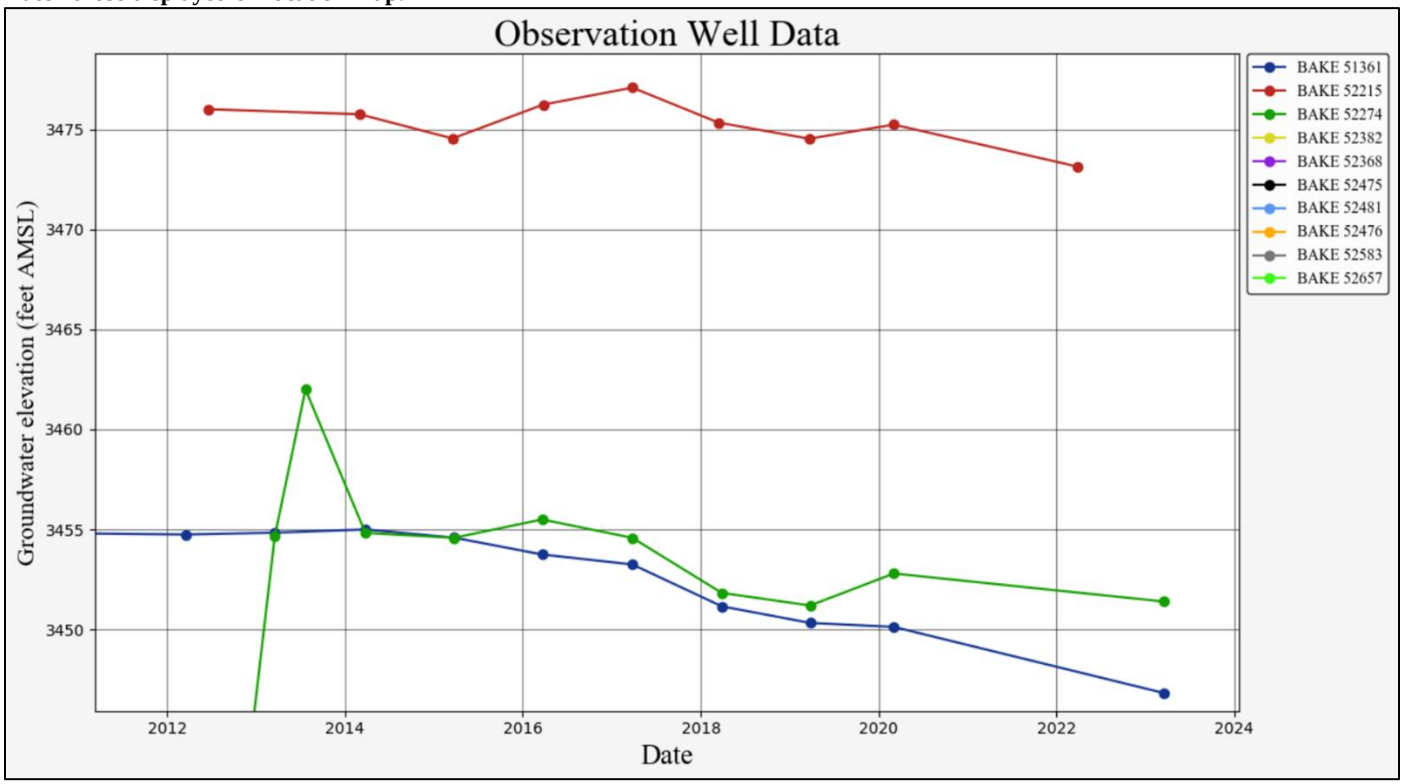


Diagram of typical alluvial fan geometry and resulting heterogeneity of materials controlling movement of groundwater. Cross-section (top) illustrates anticipated relationship to bedrock on valley margin and topographic versus piezometric surface down axis of fan.

Water-Level Measurements in Nearby Wells



Water levels near the proposed POA locations generally mimic surface topography and do not display steep declines. Hydrograph colors match those displayed on location map.



Wells at similar elevations to the proposed POA wells report moderate declines since 2014.