Groundwater Application Review Summary Form

Application # G- 19221

GW Reviewer Phillip I. Marcy Date Review Completed: 04/19/2023

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 **_April 19, 2023_**

TO: **Application** G-**_19221_**

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 04/19/2023
FROM: Groundwater Section Phillip I. Marcy
Reviewer's Name
SUBJECT: Application G- **19221** 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: **Ben Norton** County: **Baker**

A1. Applicant(s) seek(s) 2.67 cfs from 2 well(s) in the Powder Basin, subbasin

A2. Proposed use Supplemental Irrigation (160.0 acres) Seasonality: March 1st – October 31st (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	1	Alluvium	2.67	8S/40E-29 SW-NW	2530'S, 250'E fr NW cor S 29
2	Proposed	2	Alluvium	2.67	8S/40E-29 SW-NW	2163'S, 36'E fr NW cor S 29
3						
4						

* 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	3362	NA	NA	NA	100	0-40	0-50	Unknown	Unknown	NA	NA	NA
2	3361	NA	NA	NA	100	0-40	0-50	Unknown	Unknown	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** The applicant proposes to develop two wells for production of groundwater from the alluvial aquifer for supplemental irrigation of 160 acres.

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 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; "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:** There is little groundwater data in the area surrounding the proposed POA wells. Data from wells completed into the valley-fill alluvium of the Baker Valley does not indicate or suggest excessive groundwater declines. Concerning injury, the proposed POA wells are not within one mile of any existing groundwater right and therefore seasonal impacts to senior right holders are anticipated to be insignificant.

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	**Alluvium**	☐	☒
2	**Alluvium**	☐	☒
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Typically, water levels in the central portion of the valley are very close to land surface, and little head difference is exhibited between shallow and deep wells in the alluvial aquifer, suggesting that despite the valley bottom being a discharge zone, there is little resistance to vertical migration of groundwater within the alluvial sequence.

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**	**Mink Creek**	**~3355**	**3349-3360***	**20**	☒	☐	☐	☒	☐
2	**1**	**Mink Creek**	**~3355**	**3349-3360***	**300**	☒	☐	☐	☒	☐
1	**2**	**Estes Slough**	**~3355**	**3352-3355***		☒	☐	☐	☐	☒
2	**2**	**Estes Slough**	**~3355**	**3352-3355***		☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: *Surface water elevations within1 mile of proposed POAs. Surface water in the area of the proposed POA locations exists as an expression of the groundwater system within the central Baker Valley. The persistence of streams, sloughs, and ponds commonly found within this portion of the valley are a function of the seasonal variation in groundwater elevations. Seasonal highs result in gaining streams and seasonal lows result in losing streams as groundwater and surface water behave as a single resource. Flow directions to and from the streambanks in this type of environment can change in short timeframes as a result of storm and runoff events, as well as pumping and rapid discharge (Winter, 1998).

Water Availability Basin the well(s) are located within: Powder R > Snake R – AB Rock Cr. (#309202327)

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**	☒	☐	**IS72191B**	**25.0**	☒	**12.6**	☒	**<25%**	☒
2	**1**	☒	☐	**IS72191B**	**25.0**	☒	**12.6**	☒	**<25%**	☒
1	**2**	☐	☐	**IS72191B**	**25.0**	☒	**12.6**	☒	**<25%**	☒
2	**2**	☐	☐	**IS72191B**	**25.0**	☒	**12.6**	☒	**<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: Due to hydraulic connection to nearby surface waters and their close proximity, the proposed us has triggered PSI under Division 9 rules. Interference with these surface waters is anticipated to be less than 25 percent of the pumping rate after 30 days of pumping due to the likely presence of lower permeability horizons above the water-bearing zones in the POA wells. However, the cumulative impacts of pumping throughout the season are likely to result in stream depletion equaling between 24-50 percent of the groundwater withdrawn near the end of the pumping season, and a greater cumulative impact in subsequent years as surface water capture increases to make up for losses in storage over time.

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:**

In respect to consideration of Mink Creek and Estes Slough as natural and perennial streams, the language in Division 9 (OAR 690-09-040(4)(c)) requires that the Department consider interference with **surface water sources** within one mile of the proposed POA well. Considering the function of these drainages as conveyances of water to and from the Powder River, it is logical to conclude that this is a surface water source to those rights that depend on this conveyance. In addition, our conceptual understanding of groundwater in this area includes the movement of groundwater to support flows in downstream reaches of the Powder River. It has been acknowledged by the local Watermaster (personal communication 10/13/2021) that diminished flows in the Powder River have led to it being regulated more often and earlier in the season in recent years. Continued allocation of hydraulically connected groundwater from the valley-fill alluvium in the Baker Valley is anticipated to further exacerbate this trend.

References Used: Application file G-19221, groundwater review for application G-19062.

Hunt, B., 2003, Unsteady Stream Depletion When Pumping from Semiconfined Aquifer: Journal of Hydrologic Engineering, January/February 2003.

Winter, W.C., Harvey, J.W., Franke, O.L, and Alley, W.M., 1998, Ground Water and Surface Water: A Single Resource: United States Geological Survey, Circular 1139.

GWIS groundwater database, groundwater level data, well lithology data from local well logs

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

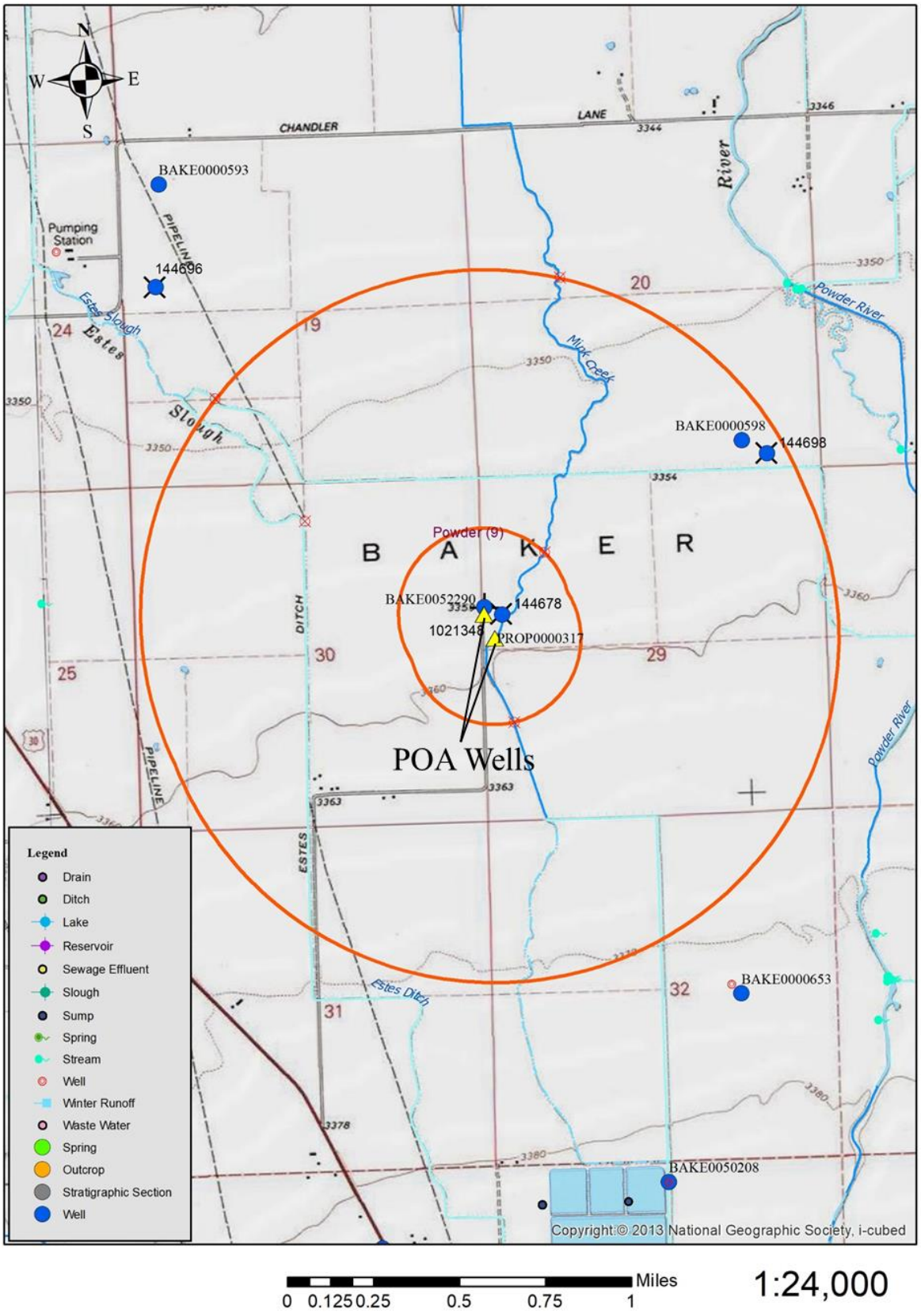
POWDER R > SNAKE R - AB ROCK CR

Watershed ID #: 30920327 Basin: POWDER Exceedance Level: 80

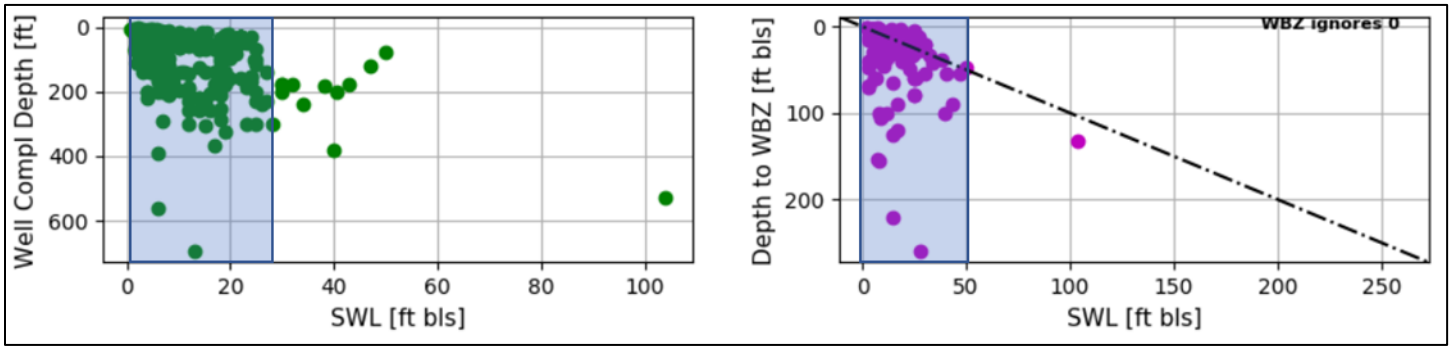
Time: 10:05 AM Date: 04/19/2023

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	36.90	79.20	-42.30	0.76	25.00	-68.00
FEB	58.70	94.90	-36.20	1.08	30.00	-67.30
MAR	99.80	168.00	-67.80	2.07	40.00	-110.00
APR	213.00	244.00	-30.70	34.20	40.00	-105.00
MAY	300.00	429.00	-129.00	9.07	40.00	-179.00
JUN	163.00	521.00	-358.00	0.00	40.00	-398.00
JUL	42.00	321.00	-279.00	0.00	25.00	-304.00
AUG	17.60	238.00	-220.00	0.00	25.00	-245.00
SEP	12.60	195.00	-183.00	0.00	25.00	-208.00
OCT	15.40	76.50	-61.10	0.26	25.00	-86.40
NOV	25.20	61.60	-36.40	0.40	25.00	-61.80
DEC	34.90	72.80	-37.90	0.58	25.00	-63.50
ANN	114,000	151,000	18,100	2,900	22,000	7,350

Well Location Map

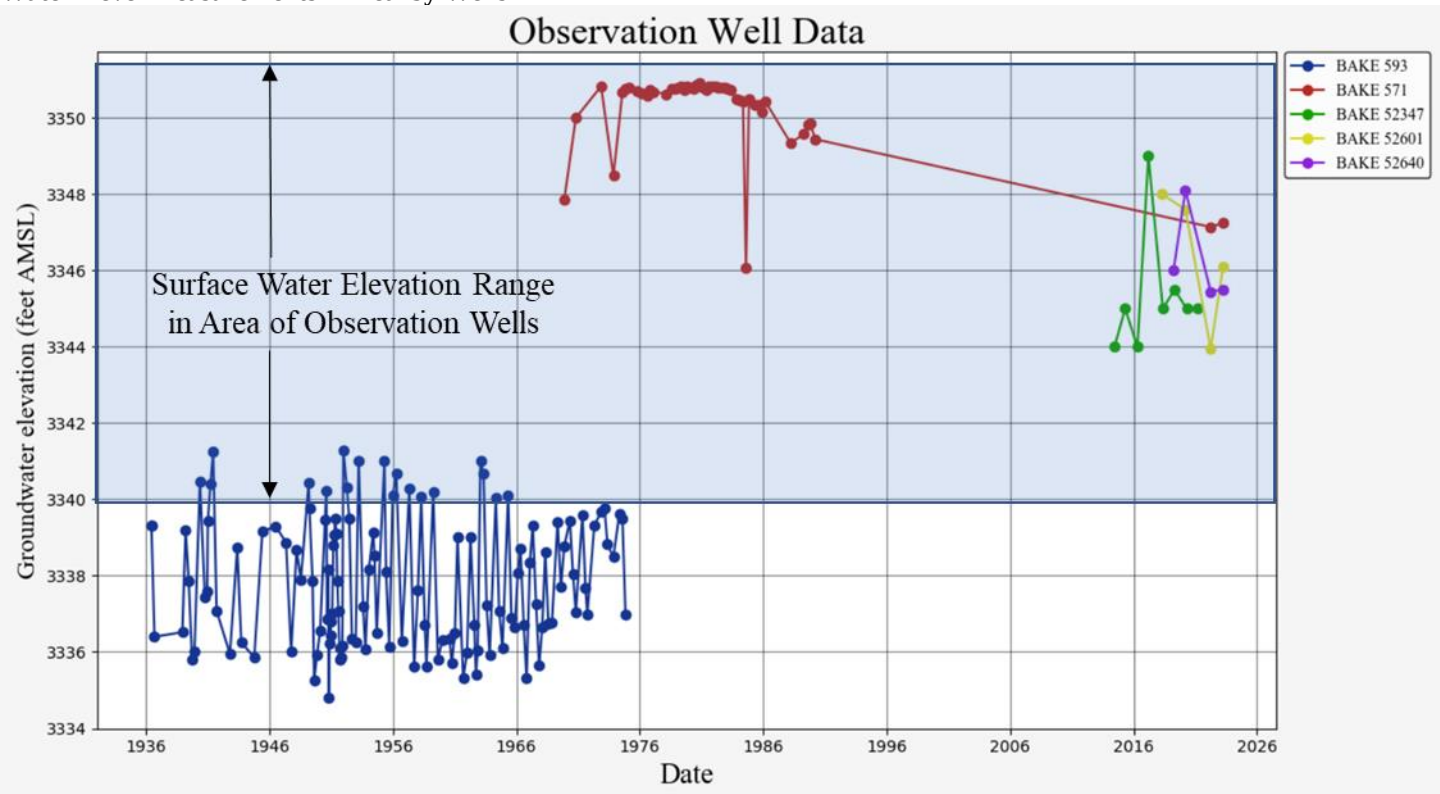


Well Statistics

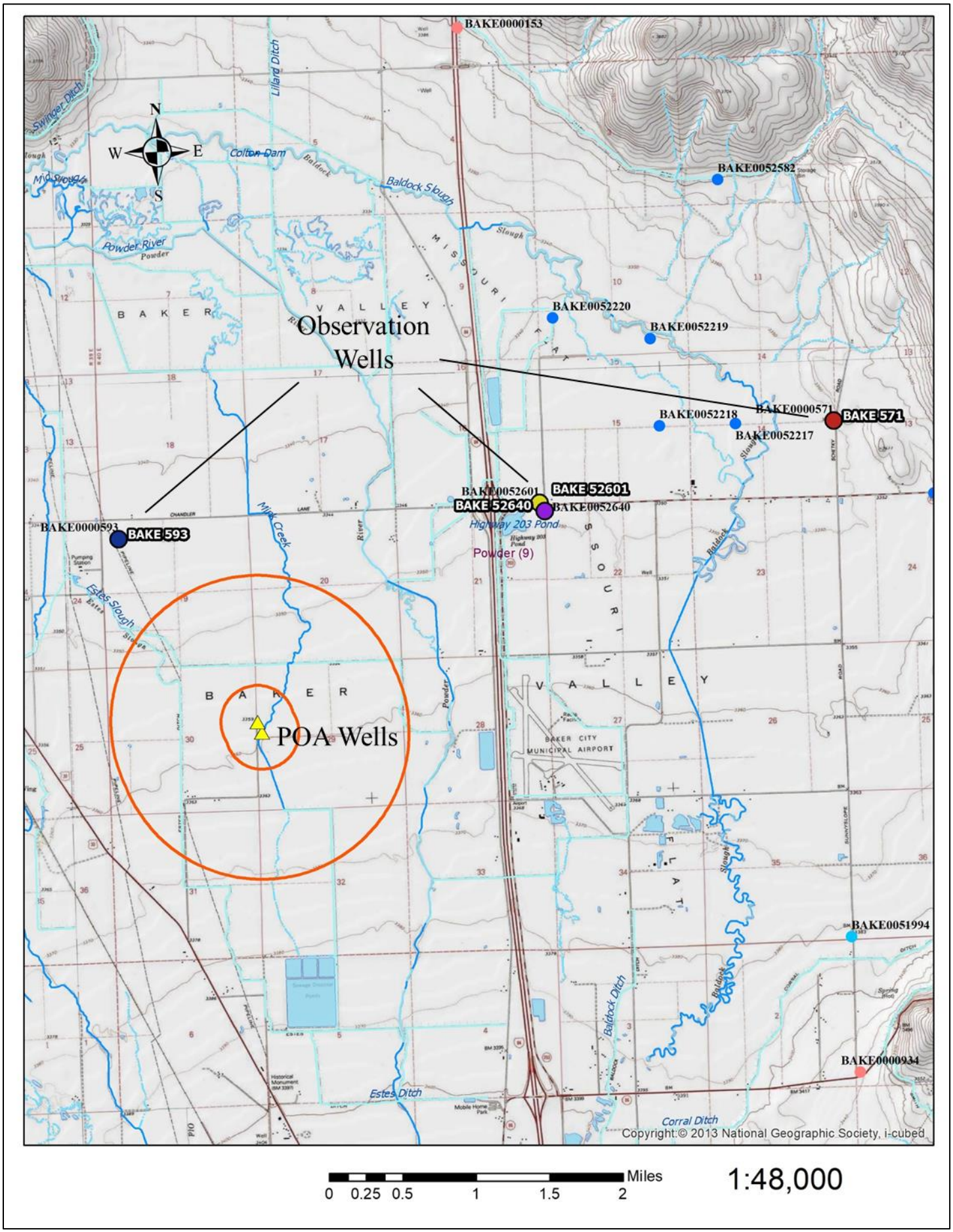


Statistics for wells in nearby section illustrate that in large part, resulting static water levels after well completion are independent of the depth of the well or the productive Water-Bearing Zone (WBZ).

Water-Level Measurements in Nearby Wells



Limited water level data are available for the area surrounding the proposed POA wells. Available data at distances greater than one mile are likely to be representative of the trends at the POA locations, which do not suggest excessive declines. Small decreases in head elevations in a poorly confined system, however, may have implications for surface water availability. See below map for well locations.


BAKE0000153
Lilland Ditch
Swingner Ditch
N
W
E
S
Colton Dam
Baldock
Baldock Slough
Mid Slough
Powder River
Powder
MISSOURI FLAT
BAKER VALLEY
Observation Wells
BAKE0052582
BAKE0052220
BAKE0052219
BAKE0052218
BAKE0000571
BAKE 571
BAKE0052217
BAKE0052601
BAKE 52601
BAKE 52640
BAKE0052640
Highway 203 Pond
Powder (9)
BAKE0000593
BAKE 593
Mill Creek
Estes Slough
POA Wells
BAKER CITY MUNICIPAL AIRPORT
BAKE0051994
BAKE0000934
Baldock Ditch
Estes Ditch
Corral Ditch
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0 0.25 0.5 1 1.5 2
Miles
1:48,000