

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 12/17/2015
 FROM: Groundwater Section Phillip I. Marcy / Ivan K. Gall
 SUBJECT: Application G- 18127 Reviewer's Name
 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: Randy Rupp County: Baker

A1. Applicant(s) seek(s) 4.7 cfs from 3 well(s) in the Powder Basin,
 _____ subbasin

A2. Proposed use Primary Irrigation (282 acres); Supplemental Irrigation (282 acres)
 Seasonality: Primary: October 2-October 31; Supplemental: March 1-October 1

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	Basalt	4.7	7S/39E-15 SW-NE	3565'N, 3250'E fr SE cor S 15
2	PROPOSED	2	Basalt	4.7	7S/39E-16	1320'N, 2640'W fr SE cor S 15
3	PROPOSED	3	Basalt	4.7	7S/39E-21 NE-NW	490'S, 3245'W fr SE cor S 15
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	3322	NA	83	06/11/2013	±400	0-18.75-80	0-80	?	150-400	?	?	NA
2	3340	NA	101	06/11/2013	±400	0-18.75-80	0-80	?	150-400	?	?	NA
3	3322	NA	83	06/11/2013	±400	0-18.75-80	0-80	?	150-400	?	?	NA

Use data from application for proposed wells.

A4. **Comments:** Wells 2 and 3 may not encounter basalt at their proposed locations, as nearby logs encounter only Mesozoic granite at depth (BAKE 51805, 0.25 miles to west; BAKE 95, 0.5 miles to the south). Local wells producing from granite tend to have low yield (10-15 GPM). Well logs within 1 mile, and to the east of the proposed location of Well 1 report the occurrence of basalt at elevations from 3130 to 3247 feet AMSL, but other nearby logs encounter granite without reporting basalt. Static water levels provided are from nearby BAKE 52275, completed into the same proposed basalt aquifer system.

A5. **Provisions of the** Powder (690-509) 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) **7C: "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:** Wells 2 and 3 are likely to encounter granite at very shallow depths, as shown by nearby well logs (BAKE 51805, BAKE 95), and geologic maps of the area (Brooks and others, 1976). Wells producing from granite aquifers in the area have stated yields of between 12 and 300 GPM, with the most productive wells reporting "decomposed granite sand". Few highly productive local wells to the north of the proposed POA locations report basalt at depth, both above and beneath granite (BAKE 52412, BAKE 52413). This may indicate the presence of a reverse fault to explain the superposition of intrusive Mesozoic granite above basalt, but this relationship would only likely be encountered very near the strike of the possible thrust fault.

Special Conditions:

1. Best management practices shall be used to maximize the efficiency of water use.
2. If a permit is issued, proposed POA wells shall only produce from the basalt aquifer, and shall be constructed with continuous case and continuous seal at least 10 feet into basalt. Wells shall not be constructed to produce from, or allow hydraulic connection to, the shallow alluvial or granite aquifer systems.
3. A dedicated water-level measuring tube shall be installed in the production well. The measuring tube shall meet the standards described in OAR 690-215-0060. When requested, access to the well shall be provided to Departmental staff in order to make water-level measurements.
4. Whenever possible, cuttings shall be collected at intervals of 10' in addition to depths at which a change in lithology is noted. These samples shall then be provided to the groundwater section upon completion of the well.

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	Basalt (Tab of Brooks and others, 1976)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Basalt (Tab of Brooks and others, 1976)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Basalt (Tab of Brooks and others, 1976)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: Although unconfined ground water occurs near the surface of the basalts, most water occurs in confined aquifers that occupy thin rubble zones (interflow zones) that occur at the contacts between lava flows. The thick interiors of the basalt flows generally have very low porosity and permeability and act as confining beds.

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	3239	3278	130	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Powder River	3239	3278	3060	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	1	Powder River	3239	3278	1720	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	2	Muddy Creek	3239	3304	4070	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	2	Muddy Creek	3239	3304	2340	<input type="checkbox"/>	<input checked="" 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"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: Effective hydraulic connection between competent basalt and the shallow alluvial aquifer system (units Qal and Qtg of Brooks and others, 1976), and therefore to surface water is likely quite inefficient. Effects from pumping from within or beneath laterally extensive lava flows are typically limited to wells with similar construction, or locations in which the stratigraphy has been incised to the extent that springs and streams emerge at the land surface. Any effects of pumping from the basalt aquifer system at this location are not likely to be observed on surface water within 1 mile. The lack of an efficient hydraulic connection with nearby streams can also be demonstrated by the lack of correspondence between groundwater elevation in local basalt wells and nearby surface waters (Figure 2).

Water Availability Basin the well(s) are located within: Powder River > Snake River – Above Eagle Creek (#72193)

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?
		<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"/>
		<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"/>
			<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: 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													
(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:** See section B3.

References Used:

OWRD Ground Water Report #6.

Ground Water Resources of Baker Valley, Baker County, Oregon, by Frederick D. Trauger.

Brooks, H.C., McIntyre, J.R., and Walker, G.W. Geologic Map of the Oregon Part of the Baker 1 degree by 2 degree Quadrangle/GMS 7. Scale 1:250,000. State of Oregon Department of Geology and Mineral Industries, 1976.

Local well log reports, application G-18127.

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

POWDER R > SNAKE R - AB EAGLE CR
Basin: POWDER

Watershed ID #: 72193
Time: 1:33 PM

Exceedance Level: 80
Date: 12/17/2015

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	89.20	119.00	-30.20	6.37	60.00	-96.60
FEB	157.00	142.00	14.90	31.40	70.00	-86.50
MAR	303.00	224.00	78.80	81.60	80.00	-82.80
APR	674.00	432.00	242.00	281.00	80.00	-118.00
MAY	857.00	1,040.00	-184.00	147.00	80.00	-411.00
JUN	644.00	1,080.00	-434.00	0.00	80.00	-514.00
JUL	220.00	583.00	-363.00	0.00	60.00	-423.00
AUG	115.00	359.00	-244.00	0.00	60.00	-304.00
SEP	80.90	277.00	-196.00	0.00	60.00	-256.00
OCT	78.80	95.80	-17.00	4.67	60.00	-81.70
NOV	86.80	73.70	13.10	5.56	60.00	-52.50
DEC	95.00	133.00	-38.30	6.14	60.00	-104.00
ANN	327,000	276,000	98,300	33,900	48,900	40,100

Well Location Map

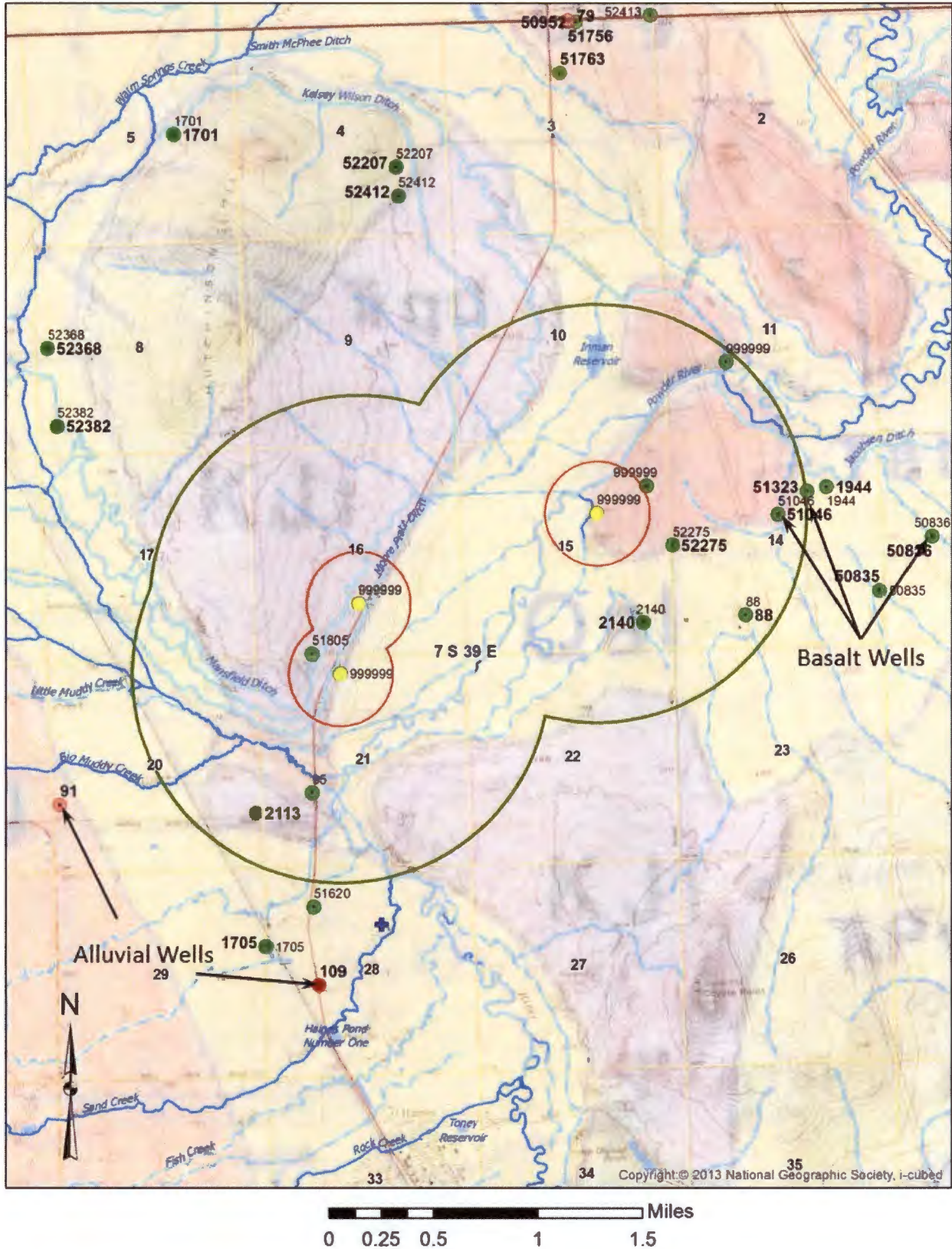


Figure 1: Proposed POA locations in context with area streams and observation wells. The geologic map of Brooks and others (1976) shows proposed locations for wells 2 and 3 directly above an intrusive granite body (KJi, purple), whereas the location for well 1 is adjacent to basalt and andesite flows (Tab, orange-red).

Water-Level Trends in Nearby Wells

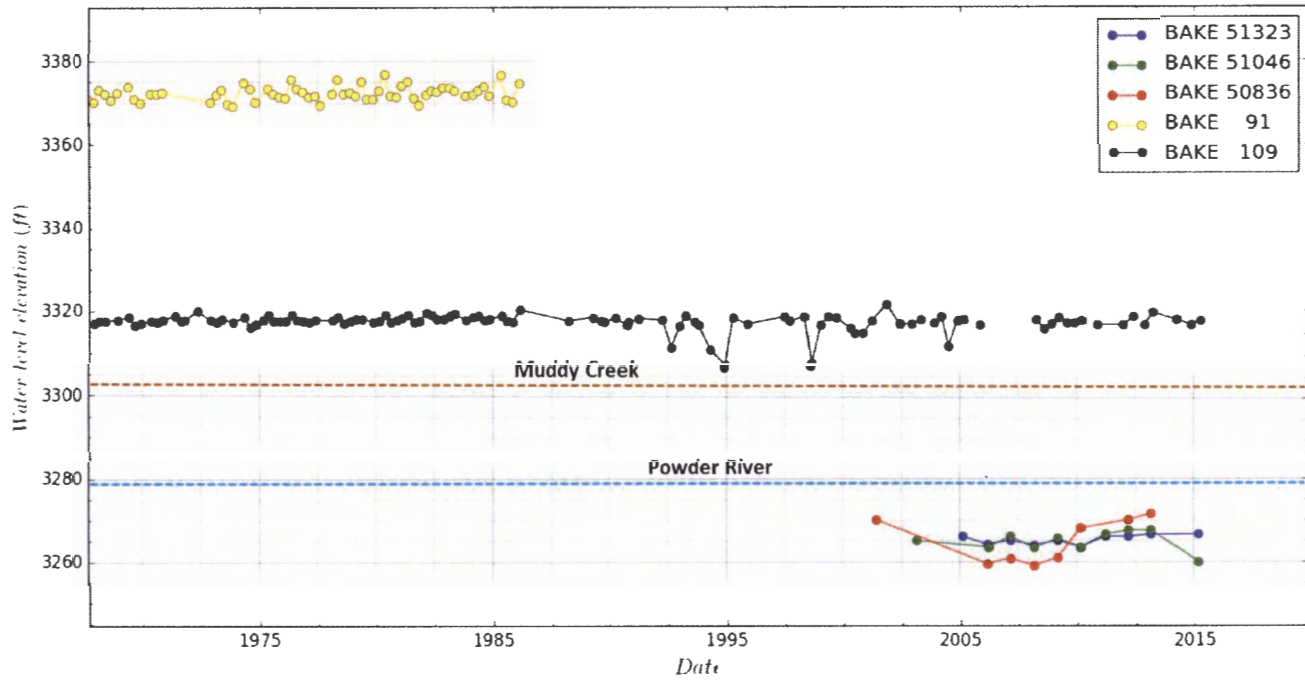


Figure 2: Nearby wells completed into basalt (BAKE 51323, BAKE 51046, BAKE 50836) show similar groundwater elevations, below that of surface streams in the area.