

Groundwater Application Review Summary Form

Application # G- 18402

GW Reviewer Phil Marcy Date Review Completed: 4/11/2017

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).

MEMO

April 11, 2017

TO: Application G- 18402

FROM: GW: Phil Maray
(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.

[illegible]

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 04/11/2017
 FROM: Groundwater Section Phillip I. Marcy
 SUBJECT: Application G- 18402 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: Kimberly R. Johnson and Reza Motameni County: Clackamas

A1. Applicant(s) seek(s) 0.045 cfs from 1 well(s) in the Willamette Basin,
Molalla subbasin

A2. Proposed use Irrigation (3.6 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	0.045	4S/2E-2 NE-NE	605'S, 965'W fr NE cor S 2
2						
3						

* 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	702	NA	NA	NA	200	0-100	0-200	TBD	TBD	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** The applicant proposes to construct a well to produce from alluvium, in this location likely Troutdale Formation of Madin (2009). In the Oregon City area, lithologies of the Troutdale Formation including sandstone (Tts), mudstone (Ttm), and conglomerate (Ttg), are complexly interbedded, and likely part of the same deposition system. Locally, these units overlie Columbia River Basalt, and are often overlain by lavas of the Boring Volcanic Field. At the location of the proposed POA, Boring Volcanics are absent, leaving Troutdale Formation rocks exposed at or near the surface.

A5. ☒ **Provisions of the** Willamette 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: The applicant's well is not located within 1/4 mile of the nearest surface water source, so the pertinent basin rules do not apply.

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;
 - 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:** A review of local well logs reveals that many of the deeper wells (> 200' deep) report encountering volcanic rocks at depths of less than 150' below land surface. This is not expected at the proposed POA location, as geologic mapping in this area does not report any lavas of the Boring Volcanic Field within 1/8 mile from the well site. Nearby wells CLAC 16323 and CLAC 57020 have seven years of water level data between 2002-2008, but show different trends from one another (see attached hydrograph). The complexity of the interbedded lavas and sediments at this location introduce uncertainty in targeting a specific water-bearing zone within the Troutdale Formation.
- _____
- _____
- _____
- _____
- _____
- _____
- _____

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	Interbedded sands and clays of the Troutdale Formation	☒	☐
		☐	☐

Basis for aquifer confinement evaluation: Local well logs typically report the presence of multiple stacked horizons of fine-grained lithologies, in addition to static water level elevations being significantly above the elevation of the productive water-bearing zone within the respective wells.

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	Buckner Creek	~570*	500-690	1500	☒	☐	☐	☐	☒
1	2	Unnamed Stream to West	~570*	500-700	2400	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Local streams within 1 mile of the proposed POA location are incised deeply into Troutdale Formation sediments and overlying Boring Lavas. Water-bearing units reported in local well logs fall well within the range of elevations to which the streams have incised. At these locations, it is expected that discharge occurs from water-bearing lithologies to the streams at a rate influenced primarily by the elevation of groundwater in the local aquifers.

*Groundwater elevation assumed from nearby well CLAC 71247, the applicant's domestic well drilled in 2015.

Water Availability Basin the well(s) are located within: Milk Creek > Molalla River – At Mouth (ID# 131)

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?
1	1	☐	☐			☐	8.92	☐	<25%	☐
1	2	☐	☐			☐	8.92	☐	<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: 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													
(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:** Impacts of pumping at the proposed POA location on nearby streams are likely to be much less than 25% at 30 days, based on calculations from the analytical Hunt (2003) model. Parameters for aquifer thickness and material were obtained from nearby well logs, with reference values used for transmissivity and storativity in mixed sand aquifers (Domenico and Schwartz, 1990).

References Used:

Gannett and Caldwell, 1998, Geologic framework of the Willamette lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A,

Hunt, B., 1999, Unsteady stream depletion from ground water pumping: *Ground Water*, v. 37, no. 1, p. 98-102.

Madin, I.P., Geologic Map of the Oregon City 7.5' Quadrangle, Clackamas County, Oregon. GMS-119, Oregon Department of Geology and Mineral Industries. 1:24,000.

Domenico, P.A. and Schwartz, F.W. (1990) Physical and chemical Hydrogeology. John Wiley and sons. New York. pp. 410-420.

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) _____

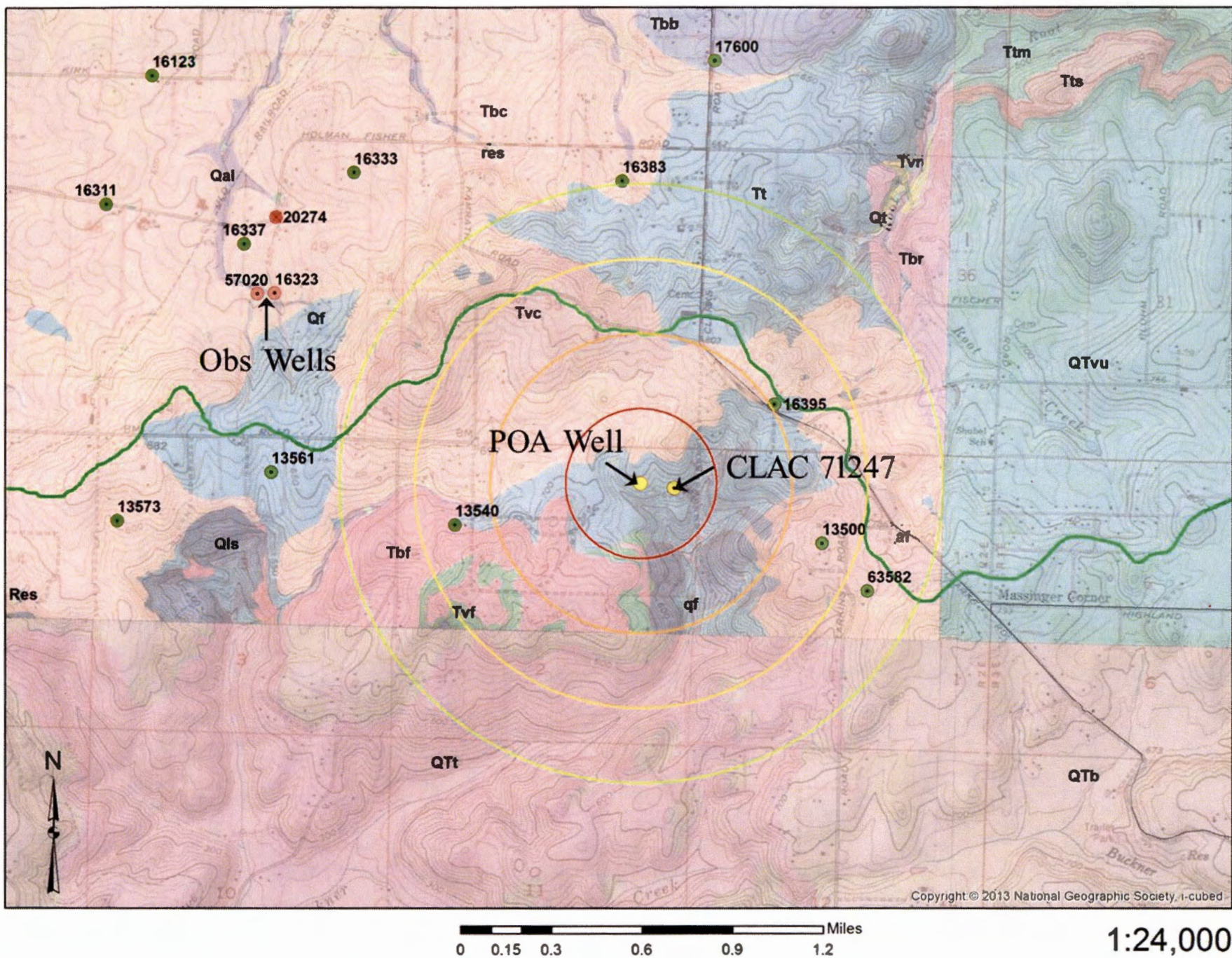
D3. **THE WELL construction deficiency or other comment is described as follows:** _____

 _____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**

Watershed ID #: 131 MILK CR > MOLALLA R - AT MOUTH Exceedance Level: 80
 Time: 11:53 AM Basin: WILLAMETTE Date: 04/11/2017

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	124.00	2.05	122.00	0.00	85.00	37.00
FEB	117.00	1.93	115.00	0.00	85.00	30.10
MAR	121.00	1.63	119.00	0.00	85.00	34.40
APR	91.50	1.87	89.60	0.00	85.00	4.63
MAY	59.20	5.02	54.20	0.00	85.00	-30.80
JUN	26.50	7.49	19.00	0.00	60.00	-41.00
JUL	10.00	12.70	-1.91	0.00	40.00	-41.90
AUG	8.92	10.50	-1.54	0.00	20.00	-21.50
SEP	8.95	4.64	4.31	0.00	20.00	-15.70
OCT	15.20	1.68	13.50	0.00	40.00	-26.50
NOV	32.20	1.53	30.70	0.00	85.00	-54.30
DEC	92.00	2.16	89.80	0.00	85.00	4.84
ANN	93,600	3,230	90,400	0	46,700	48,800

Well Location Map



Water-Level Trends in Nearby Wells

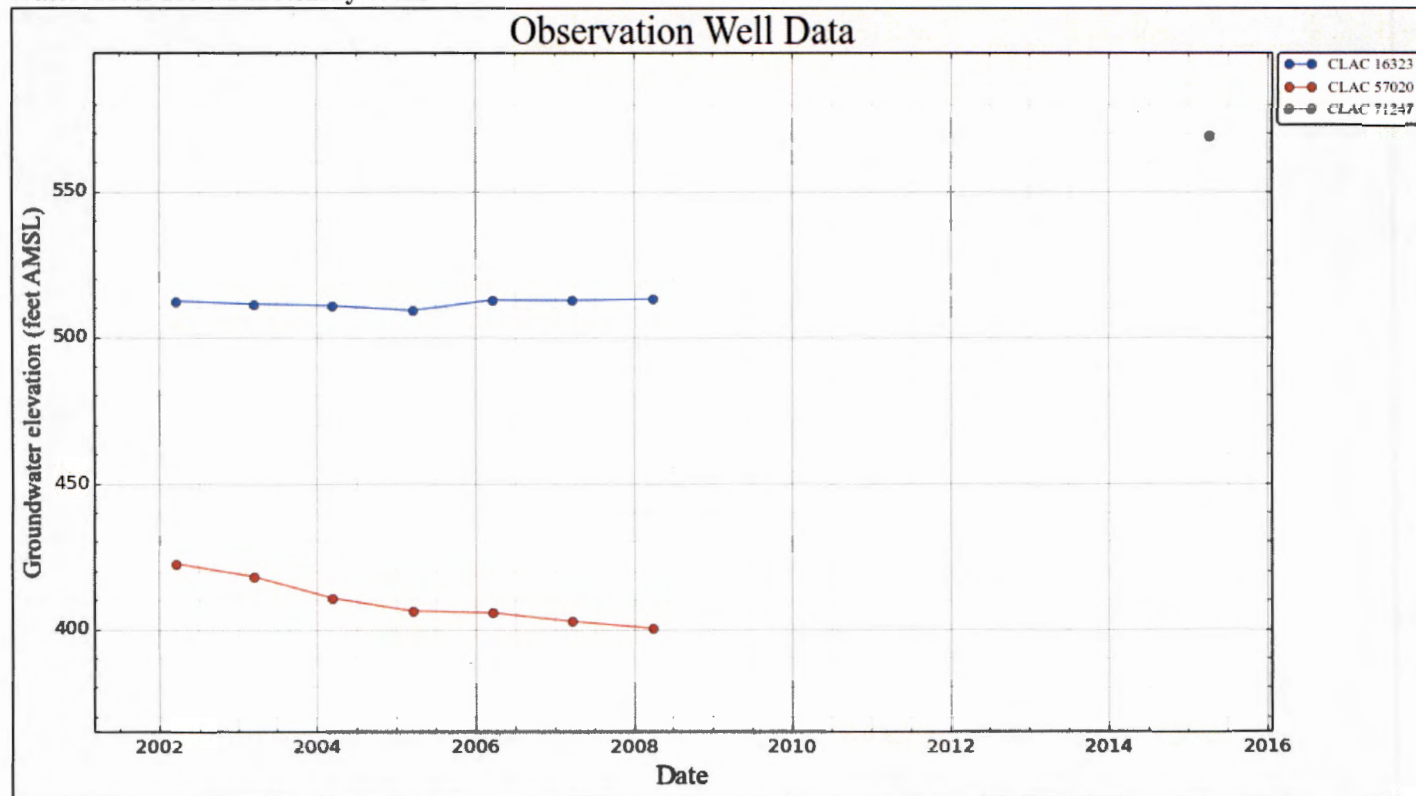


Figure 1: Nearby wells CLAC 57020 and CLAC 16323 show distinctly different trends, despite being only 300' apart. CLAC 16323 encounters a lava flow not reported on the driller's log for CLAC 57020, despite being the deeper of the two wells. CLAC 71247 is located about 300' east of the proposed POA location, and displays a significantly higher groundwater elevation.