Approved: 

MEMO

To: Kristopher Byrd, Well Construction Manager

From: Tommy Laird, Well Construction Program Coordinator

Subject: Review of Water Right Application G-18342

Date: May 29, 2024

The attached application was forwarded to the Well Construction Section by the Groundwater Section. Joe Kemper reviewed the application. Please see Joe's Groundwater Review.

Applicant's Well #1 (Proposed): Well #1 is a proposed well, therefore it cannot be reviewed for construction. Construction of this proposed well shall be completed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240. During construction of this well, specific attention should be paid to ensure sealing requirements are met and that the well does not commingle aquifers.

The construction of proposed Well #1 may not satisfy hydraulic connection issues.

Groundwater Application Review Summary Form

Application # G- _18342_

GW Reviewer _Joe Kemper_ Date Review Completed: _9/18/2023_

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 **_September 18, 2023_**

TO: **Application** G-**_18342_**

FROM: **GW: _Joe Kemper_**
(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 Rogue 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
0.083	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**	**0.083**

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date **9/18/2023**

FROM: Groundwater Section **Joe Kemper**
Reviewer's Name

SUBJECT: Application G- **18342** Supersedes review of **9/7/2016**
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: **Louis Liu, He He Properties of America** County: **Jackson**

A1. Applicant(s) seek(s) **0.167** cfs from **1** well(s) in the **Rogue** Basin, _____ subbasin

A2. Proposed use **Nursery** Seasonality: **year-round**

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	Bedrock	0.167	35S/1W-27 SW ¼ NW ¼	1527' S, 392' E fr NW cor S 27
2						
3						
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	1420	108*	15.67*	3/19/2014*	134*	0-21*	0-21*	n/a	n/a	100*	89*	Air*

Use data from application for proposed wells.

A4. **Comments:** The nearest located well (JACK 2932) was used to estimate the well description. No well construction details (well depth, well seal, casing depth) are provided in the application. Well construction conditions are recommended in Section B2 to address this uncertainty.

A5. ☐ **Provisions of the** Rogue 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: N/A

A6. ☐ **Well(s) #** _____ , _____ , _____ , _____ , _____ , tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: _____
Comments: N/A

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) **7N (as modified below), 7J, 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 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): N/A

B3. **Groundwater availability remarks:** The applicant requests the use of 0.167 cfs (75 gpm) from a single proposed well for 30 acres of nursery use. The applicant's well would access an aquifer hosted in the secondary porosity (fractures and joints) within early Western Cascades volcanics (Wiley and Smith, 1993) (Hladky, 1992). Water levels in adjacent observation wells indicate moderate seasonal fluctuations (10-15 feet) with larger drawdown (>50 feet) resulting from well-to-well interference. Water level records do not indicate any year-on-year declines at this time so the resource does not appear to be over-appropriated as per current understanding of pertinent rule and statute. However, the target aquifer has relatively low storage and is constrained by the extent and interconnection of water bearing fractures, making the target aquifer prone to persistent seasonal declines and well-to-well interference.

OFR 2021-05 (Kemper, 2021, available at https://www.oregon.gov/owrd/wrdreports/OFR_2021_05_report.pdf) documents the results of a pumping test conducted by OWRD staff in April 2020, in which well XP-7 (JACK 30158) was pumped for 8 hours at 142 GPM causing 14.6 feet of drawdown at XP-5 (JACK 2909) and 7.6 feet of drawdown at Harrington-2 (JACK 62926 under permit G-16926). This report shows that the target aquifer consists of a heterogenous fracture network that functions as a single aquifer but has interconnected fractures that propagate pressure quickly between wells that share that fracture system. To assess injury from this application, Theis distance drawdown modeling with aquifer parameters from OFR 2021-05 estimates that pumping from the proposed well location at the requested rate (0.1671 cfs) would cause 25-85 feet of drawdown at JACK 62926 within 1-5 days. This would trigger decline conditions for JACK 62926 and for this application and require regulation of the proposed well. In addition, groundwater in the target aquifer flows primarily through fractures, so full penetration of senior groundwater users is not necessarily required for a finding of injury (OAR 690-008-0001(8). Considering the hydrogeologic context and high magnitude of interference, the requested use is determined to injure JACK 62926 and is not within the capacity of the resource.

Considering the heterogeneous fractured target aquifer, it is possible that the applicant could drill a well into a fracture network that has poor hydraulic connection with adjacent wells. The applicant could overcome the injury and capacity of the resource finding if they drilled a well and conducted an interference test which showed that any well-to-well interference would not exceed thresholds listed in permit 7N above and decline conditions listed on permit G-16926. That report must be submitted to the OWRD Groundwater Section and approved before these findings are changed

Interference Test Requirements: If the applicant would like to overcome the injury and capacity of the resource findings in this review, it must be demonstrated to the Department that a potential permitted well would not trigger permit decline conditions through a well-to-well interference test with adjacent senior groundwater users as was documented in OFR 2021-05. This may be demonstrated by permitting Department staff access to conduct an interference test on site, or by hiring a qualified individual (as per OAR 690-217-0050) to conduct an interference test. This test shall pump from the proposed well for at least 8 hours while documenting a response in at least one adjacent senior POA. The permittee shall provide notice to the Regional Watermaster's Office at least two weeks prior to the test, and the test results and data shall be submitted to the Department's Groundwater Section in a reasonable format. A formal aquifer test report is not required. Specific details not described herein shall conform to Pump-Testing Rules OAR 690-217. If test quality is not sufficient to demonstrate well-to-well interference or lack thereof, it will not be accepted as satisfying this requirement.

If this application is amended to the satisfaction of the Department and a permit is issued, it should include the conditions indicated above in B1.d.iii and detailed below:

B1(d), 7N Modification: The standard Static Water Level Condition shall be modified in the following way: *The Department requires the water user to measure and report static water levels for each well on the permit twice annually. The static water level shall be measured in the month of March and October. Reports shall be submitted to the Department within 30 days of measurement.*

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	**Volcaniclastic rocks of the Western Cascades**	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Nearby well log JACK 2932 reports the water level rises above the water-bearing zone, indicating the aquifer is more confined than unconfined.

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**	**Hog Creek**	**1424**	**1400**	**4040**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Groundwater elevation at the well is above surface water. Groundwater likely discharges to surface water down-gradient, indicating hydraulic connection.

Water Availability Basin the well(s) are located within: Watershed ID #: 270 ROGUE R > PACIFIC OCEAN - AB CURRY G AT GAGE 14359000

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**	☐	☐	**n/a**	**n/a**	☐	**1130**	☐	*****	☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: * Interference at 30 days could not be estimated because the terrain (high-relief slopes) and geology (fractured bedrock aquifer) do not meet model assumptions of the widely accepted techniques for determining stream depletion (e.g., Hunt 1999, 2003).

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													
		%	%	%	%	%	%	%	%	%	%	%	%
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: N/A

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:** Under OAR 690-009 the proposed use does not produce the finding of potential for substantial interference with nearby surface water.

References Used:

Beaulieu, J.D., Hughes, P.W. 1977 Land Use Geology of Central Jackson County, Oregon. State of Oregon Department of Geology and Mineral Industries Bulletin 94, 87 p.

Hunt, B. 1999. Unsteady Stream Depletion from Ground Water Pumping. Journal of Hydrologic Engineering, Vol 8(1), pp 12-19

Hunt, B. 2003. Unsteady Stream Depletion when Pumping from a Semiconfined Aquifer. Journal of Hydrologic Engineering. Vol 8(1), pp 12-19.

U.S. Geological Survey topographic map, Shady Cove and Eagle Point Quadrangles.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #**: _____ **Logid: this section does not apply**

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

Water Availability Analysis

Detailed Reports

ROGUE R > PACIFIC OCEAN - AB CURRY G AT GAGE 14359000

ROGUE BASIN

Water Availability as of 9/7/2016

Watershed ID #: 270 (Map) Exceedance Level:80%

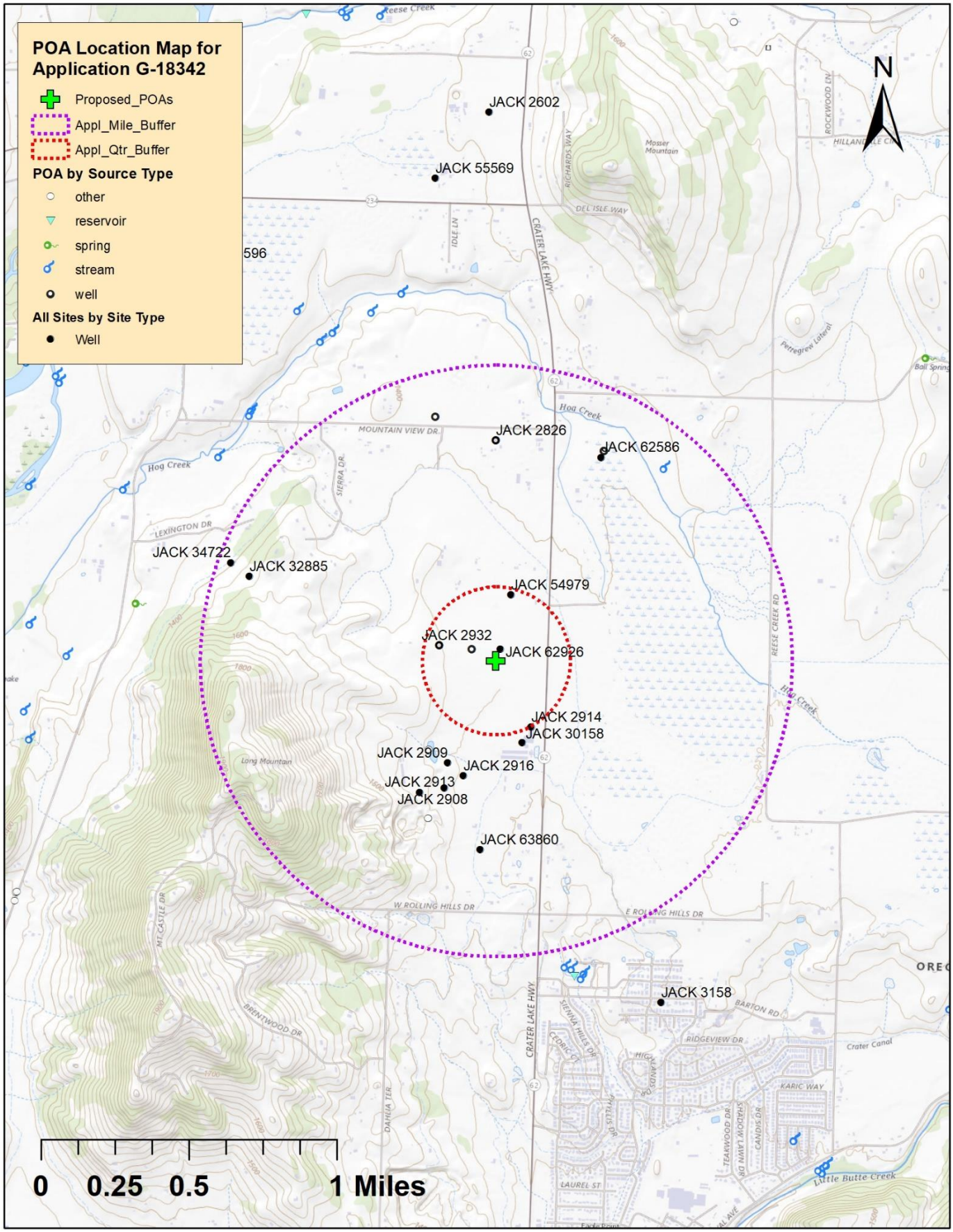
Date: 9/7/2016 Time: 11:41 AM

Water Availability Calculation

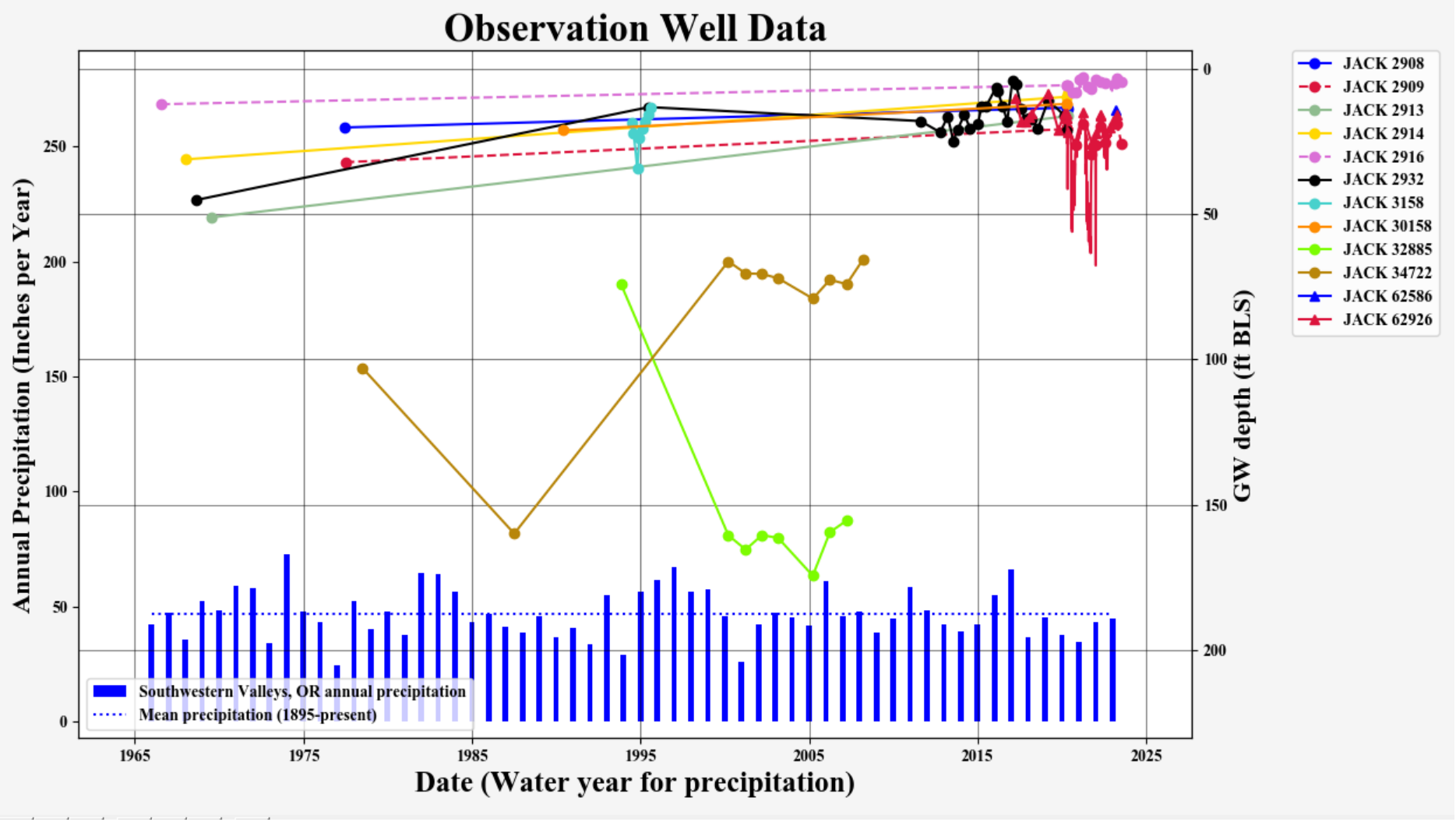
Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	2,180.00	1,130.00	1,050.00	0.00	1,200.00	-147.00
FEB	2,710.00	2,040.00	666.00	0.00	1,200.00	-534.00
MAR	2,750.00	1,820.00	934.00	0.00	1,200.00	-266.00
APR	2,810.00	1,030.00	1,780.00	0.00	1,200.00	576.00
MAY	2,750.00	367.00	2,380.00	0.00	1,200.00	1,180.00
JUN	1,760.00	343.00	1,420.00	0.00	1,200.00	217.00
JUL	1,330.00	368.00	962.00	0.00	1,200.00	-238.00
AUG	1,160.00	330.00	830.00	0.00	1,200.00	-370.00
SEP	1,130.00	275.00	855.00	0.00	1,200.00	-345.00
OCT	1,160.00	227.00	933.00	0.00	1,200.00	-267.00
NOV	1,370.00	344.00	1,030.00	0.00	1,200.00	-174.00
DEC	1,810.00	561.00	1,250.00	0.00	1,200.00	49.00
ANN	1,900,000.00	528,000.00	1,370,000.00	0.00	869,000.00	533,000.00

Well Location Map



Water-Level Trends in Nearby Wells



Theis (1935) Distance Drawdown Modeling

Theis Time-Drawdown Worksheet v.5.00

Calculates Theis nonequilibrium drawdown and recovery at any arbitrary radial distance, r, from a pumping well for 3 different T values and radial distance, r, from a pumping well for 3 different T values and 2 different S values.

Written by Karl C. Wozniak September 1992. Last modified December 17, 2019

Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units	
Total pumping time	t		5		d	
Radial distance from pumped well:	r		225		ft	**Q conversions**
Pumping rate	Q		0.167		cfs	74.95 gpm
Hydraulic conductivity	K	1	1.8	3	ft/day	0.17 cfs
Aquifer thickness	b		100		ft	10.02 cfm
Storativity	S_1		0.00001			14,428.80 cfd
	S_2		0.00005			0.33 af/d
Transmissivity Conversions	T_f2pd	100	180	300	ft2/day	
	T_ft2pm	0.069444	0.125	0.208333	ft2/min	Recalculate
	T_gpdpft	748	1346.4	2244	gpd/ft	

Use the Recalculate button if recalculation is set to manual