

Approved by: 

MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager
From: Travis Kelly, Well Construction Program Coordinator
Subject: Review of Water Right Application G-18931
Date: July 28, 2020

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

Applicant's Well #1 (JACK 63759): Based on a review of the Well Report, Applicant's Well #1 seems to protect the groundwater resource.

The construction of Applicant's Well #1 may not satisfy hydraulic connection issues.

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

JACK 63759

WELL I.D. LABEL# L

133121

START CARD #

1042310

4/9/2019

ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name Last Name
Company MEDFORD SCHOOL DISTRICT 549C
Address 500 MONROE ST
City MEDFORD State OR Zip 97501

(2) TYPE OF WORK

[X] New Well [] Deepening [] Conversion
[] Alteration (complete 2a & 10) [] Abandonment (complete 5a)

(2a) PRE-ALTERATION

Casing: Dia + From To Gauge Stl Plstc Wld Thrd
Material From To Amt sacks/lbs
Seal:

(3) DRILL METHOD

[X] Rotary Air [] Rotary Mud [] Cable [] Auger [] Cable Mud
[] Reverse Rotary [] Other

(4) PROPOSED USE

[X] Domestic [] Irrigation [] Community
[] Industrial/ Commercial [] Livestock [] Dewatering
[] Thermal [] Injection [] Other

(5) BORE HOLE CONSTRUCTION

Special Standard [] (Attach copy)
Depth of Completed Well 240.00 ft.

Table with columns: Dia, From, To, Material, From, To, Amt, sacks/lbs. Includes rows for Bentonite Chips and Calculated values.

How was seal placed: Method [] A [] B [] C [] D [] E

[X] Other DRY POURED

Backfill placed from ft. to ft. Material

Filter pack from ft. to ft. Material Size

Explosives used: [] Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE

Proposed Amount Actual Amount

(6) CASING/LINER

Table with columns: Casing, Liner, Dia, +, From, To, Gauge, Stl, Plstc, Wld, Thrd. Includes rows for 6 inch and 4 inch casings.

Shoe [] Inside [X] Outside [] Other Location of shoe(s) 77.5

Temp casing [] Yes Dia From + To

(7) PERFORATIONS/SCREENS

Perforations Method LAZER CUT/SAWCUT

Screens Type Material

Table with columns: Perf/ Screen, Casing/ Liner, Dia, From, To, Scrn/slot width, Slot length, # of slots, Tele/ pipe size. Includes rows for 4 inch perforations.

(8) WELL TESTS: Minimum testing time is 1 hour

[] Pump [] Bailer [X] Air [] Flowing Artesian

Table with columns: Yield gal/min, Drawdown, Drill stem/Pump depth, Duration (hr). Includes row for 20 gal/min yield.

Temperature 53 °F Lab analysis [] Yes By

Water quality concerns? [] Yes (describe below) TDS amount 226 ppm

Table with columns: From, To, Description, Amount, Units.

(9) LOCATION OF WELL (legal description)

County JACKSON Twp 38.00 S N/S Range 3.00 W E/W WM
Sec 27 NE 1/4 of the SW 1/4 Tax Lot 200
Tax Map Number Lot
Lat " or 42.23480600 DMS or DD
Long " or -123.04498200 DMS or DD

[X] Street address of well [] Nearest address

156 UPPER APPLGATE RD. JACKSONVILLE, OR 97530

(10) STATIC WATER LEVEL

Table with columns: Existing Well / Pre-Alteration, Date, SWL(psi), +, SWL(ft). Includes row for 4/1/2019 with SWL of 23.

Flowing Artesian? [] Dry Hole? []

WATER BEARING ZONES

Depth water was first found 91.00

Table with columns: SWL Date, From, To, Est Flow, SWL(psi), +, SWL(ft). Includes rows for 4/1/2019 with various SWL values.

(11) WELL LOG

Ground Elevation

Table with columns: Material, From, To. Includes rows for BROWN CLAY & SMALL GRAVEL, BRN BASALT/SM GRAVEL, etc.

Date Started 4/1/2019

Completed 4/1/2019

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

License Number Date

Signed

(bonded) Water Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

License Number 1835 Date 4/9/2019

Signed KEVIN GILL (E-filed)

Contact Info (optional) CLOUSER DRILLING INC.

Groundwater Application Review Summary Form

Application # G- 18931

GW Reviewer Joe Kemper Date Review Completed: 7/24/2020

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

July 24th, 2020

TO: Application G- 18931

FROM: GW: Joe Kemper
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

YES The source of appropriation is hydraulically connected to a State Scenic Waterway or its tributaries

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 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 7/24/2020
 FROM: Groundwater Section Joe Kemper
Reviewer's Name
 SUBJECT: Application G- 18931 Supersedes review of na
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: Ruch Elementary School County: Josephine

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

A2. Proposed use Irrigation (2 acres) Seasonality: 3/1 to 10/31

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	JACK 63759	1	Bedrock	0.045	38S/3W-27 NE-SW	484' S & 515' W FR C1/4 COR, S27
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	1536	91	23	4/1/2019	240	0-60	0-77.5	0-207	207-240	20	217	Air

Use data from application for proposed wells.

A4. **Comments:** _____

A5. **Provisions of the** Rogue (OAR 690-515) 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 Rogue basin rules contain no such provisions.

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; 7J; Medium 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:** The applicant’s well accesses groundwater hosted in fractured bedrock of the Western Hayfork terrane. Bedrock at this site is overlain by ~50 feet of unconsolidated terrace sediments, which do not appear to be a source of water. Well yields in TRS 38S/3W-S27 are low (median = 10 gpm), and yields typically decrease with depths beyond 200-300 feet, both of which are typical for the fractured bedrock aquifers in the area. Water level trends in adjacent OWRD observation wells indicate that aquifer levels respond to both seasonal precipitation and year-to-year precipitation variation. Water level records do not span a long enough time period to conclude that the resource is or is not over appropriated.

This area has relatively high groundwater development; there are ~150 well logs filed in section 27 and 11 groundwater POAs within a mile of the applicant’s well. The Theis equation (1935) is used to estimate maximum well-to-well interference from the proposed use (5 AF total at 20 gpm for 56.6 days to the nearest tax lot, ~300 feet). The resulting drawdown is expected to be less than 10-15 feet. Water use, static water level, and interference conditions should be applied.

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	Fractured Bedrock of Western Hayfork Terrane	<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"/>

Basis for aquifer confinement evaluation: In fractured-bedrock aquifer systems, water is stored and transmitted primarily by discrete but connected fracture sets. These fractures generally extend to near the surface, so water within these fractures is likely under atmospheric pressure (unconfined) despite an overall low storage coefficient for the aquifer system as a whole and static water levels often reported above water-bearing zones on driller’s logs. Terrace sediments do overlie the bedrock system here, but available well logs and water level data suggest that they are saturated only seasonally and likely act as an extension of the underlying bedrock aquifer system as opposed to a confining unit.

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	Forest Creek	1513	1478	615	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	Applegate River	1513	1400	5900	<input checked="" type="checkbox"/>	<input 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"/>

Basis for aquifer hydraulic connection evaluation: Groundwater elevations are higher than adjacent surface water sources, indicating that groundwater is flowing towards and discharging to streams. Additionally, there are multiple mapped and permitted springs in the vicinity indicating that groundwater is discharging to the surface. Deeper groundwater flow paths also likely discharge to the Applegate River.

Water Availability Basin the well(s) are located within: FOREST CR > APPLGATE R - AT MOUTH; impacts also considered for APPLGATE R > ROGUE R - AB JOE G

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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	IS71614A	0.1	<input checked="" type="checkbox"/>	0.01	<input checked="" type="checkbox"/>	>50	<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"/>

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: Stream depletion is estimated using the Hunt (1999) analytical model using bulk aquifer parameters representative of local geology.

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
1	1	%	%	%	%	%	%	%	%	%	%	%	%
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 analysis is not completed as the proposed rate (0.045 cfs) is less than 1% the adopted minimum streamflow for the Applegate River (1% of 38.4 cfs or 0.384).

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 applicant's POA would produce water from an unconfined aquifer that is found to be hydraulically connected to Forest Creek and to the Applegate River. Because the well accesses an unconfined aquifer and is located within ¼ mile of Forest Creek, it is automatically assumed to be hydraulically connected to Forest Creek and to have the Potential for Substantial Interference (PSI) as per OAR 690-009.

Additionally, the proposed rate (0.045 cfs or 20 gpm) is greater than 1% of the adopted minimum streamflow (1% of 0.01 cfs or 0.0001 cfs) and is greater than 1% of the adjacent instream water right (1% of 0.10 cfs). The results of stream depletion modeling indicate that stream depletion would be greater than 25% after 30 days of pumping. These metrics also result in the assumption of PSI as per OAR 690-009. Because the well is within ¼ mile of Forest Creek, reducing the requested rate will not change the PSI finding.

References Used:

Donato, M.M., 1995, Preliminary geologic map of part of the Ruch quadrangle, Jackson County, Oregon: U.S. Geological Survey, Open-File Report OF-95-640, scale 1:24,000

Hunt, B. 1999. Unsteady Stream Depletion from Ground Water Pumping. Journal of Hydrologic Engineering, Vol 8(1), pp12-19

Jenks, M.D., Mertzman, S.A., Wiley, T.J., Staub, P.E., Drazba, Marina, Marina, Lina., Niewendorp, C.A., and Madin, I.P., 2007, Preliminary geologic compilation map of the southwest portion of Oregon: Oregon Department of Geology and Mineral Industries, Open-File Report O-07-16, scale 1:100,000

OWRD Groundwater Information System Database – Accessed 7/23/2020.

Theis, C.V., 1935. The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage, Am. Geophys. Union Trans., vol. 16, pp. 519-524.

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

Water Availability Analysis

Detailed Reports

FOREST CR > APPLGATE R - AT MOUTH
 ROGUE BASIN

Water Availability as of 7/23/2020

Watershed ID #: 71614 ([Map](#))

Exceedance Level: 80% ▾

Date: 7/23/2020

Time: 6:12 AM

Water Availability Calculation	Consumptive Uses and Storages	Instream Flow Requirements	Reservations
Water Rights	Watershed Characteristics		

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	3.47	0.03	3.44	0.00	9.39	-5.95
FEB	6.24	0.11	6.13	0.00	12.00	-5.87
MAR	7.45	0.05	7.40	0.00	12.00	-4.60
APR	7.02	0.33	6.69	0.00	11.30	-4.61
MAY	5.73	0.53	5.20	0.00	8.19	-2.99
JUN	2.04	0.74	1.30	0.00	5.40	-4.10
JUL	0.13	0.98	-0.85	0.00	0.92	-1.77
AUG	0.25	0.81	-0.56	0.00	0.12	-0.68
SEP	0.01	0.54	-0.53	0.00	0.10	-0.63
OCT	0.09	0.18	-0.09	0.00	0.82	-0.91
NOV	1.25	0.02	1.23	0.00	2.63	-1.40
DEC	2.46	0.02	2.44	0.00	5.66	-3.22
ANN	4,720.00	263.00	4,520.00	0.00	4,110.00	597.00

Water Availability Analysis Detailed Reports

APPLEGATE R > ROGUE R - AB JOE G
ROGUE BASIN

Water Availability as of 7/23/2020

Watershed ID #: 250 ([Map](#))

Exceedance Level:

Date: 7/23/2020

Time: 6:12 AM

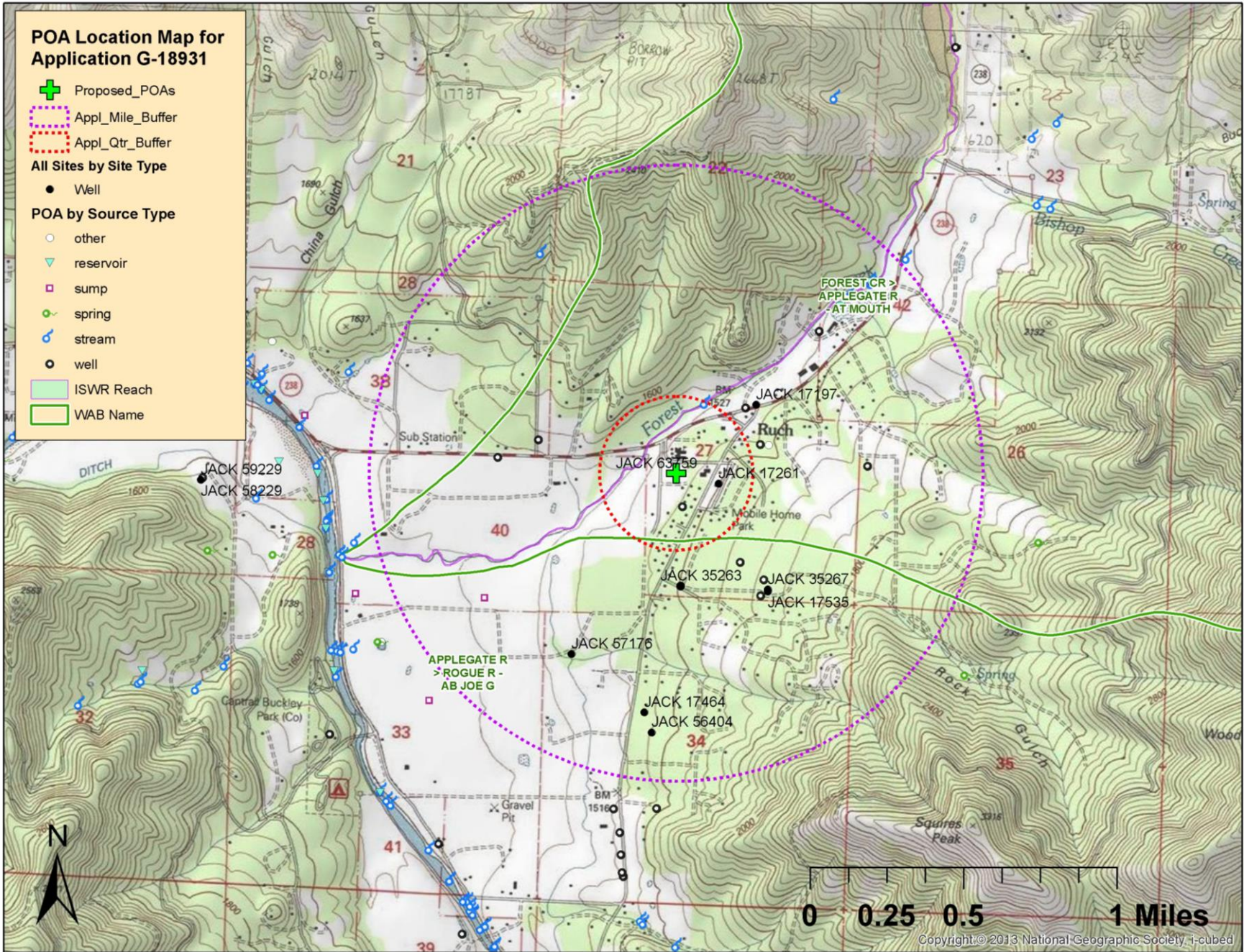
Water Availability Calculation	Consumptive Uses and Storages	Instream Flow Requirements	Reservations
	Water Rights		Watershed Characteristics

Water Availability Calculation

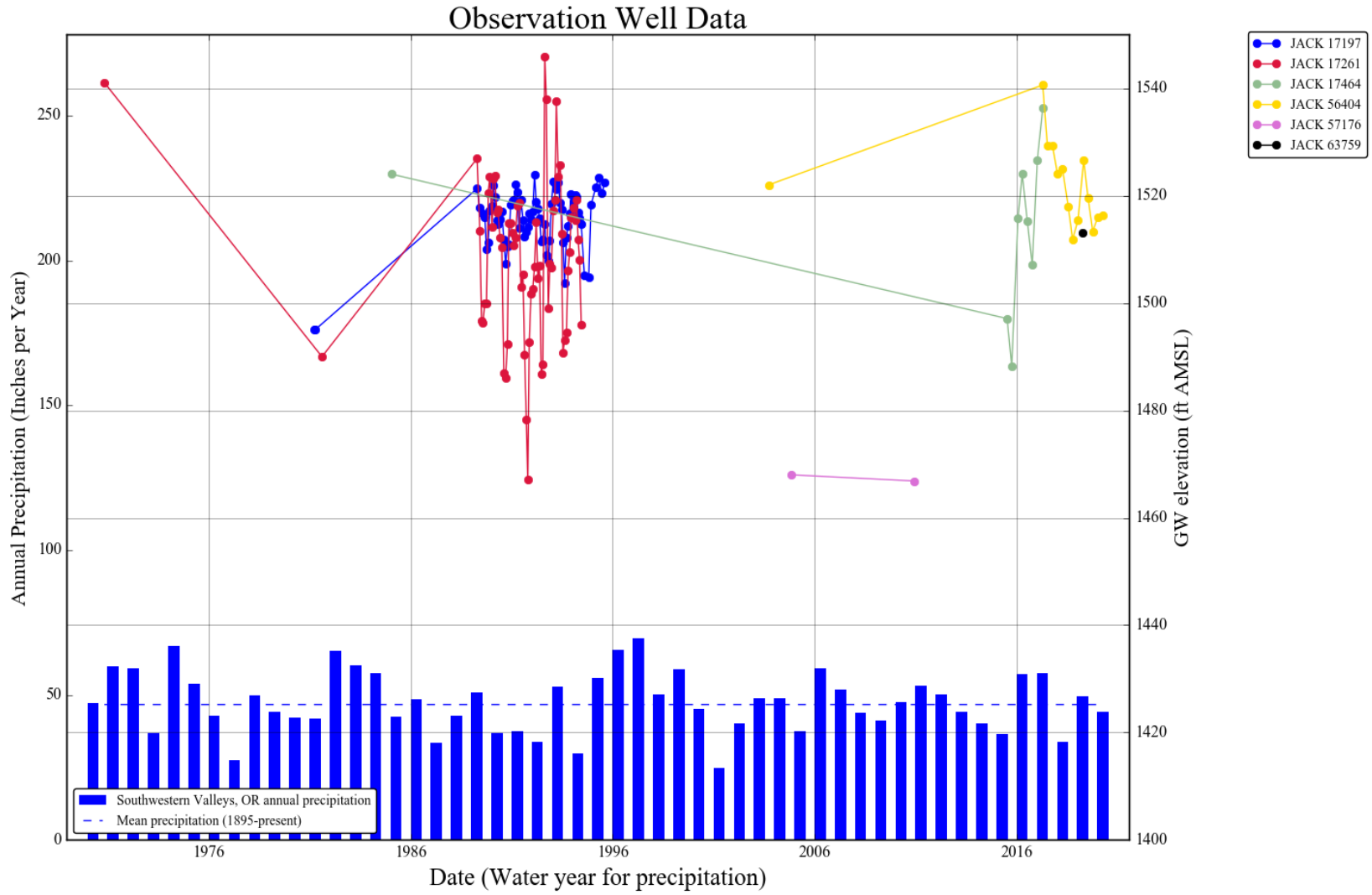
Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	204.00	2.39	202.00	0.00	200.00	1.61
FEB	378.00	436.00	-57.60	0.00	200.00	-258.00
MAR	463.00	435.00	28.00	0.00	265.00	-237.00
APR	481.00	450.00	30.50	0.00	265.00	-234.00
MAY	469.00	28.10	441.00	0.00	265.00	176.00
JUN	183.00	38.70	144.00	0.00	265.00	-121.00
JUL	70.90	51.40	19.50	0.00	230.00	-211.00
AUG	47.60	42.60	4.98	0.00	200.00	-195.00
SEP	38.40	28.30	10.10	0.00	200.00	-190.00
OCT	41.00	10.10	30.90	0.00	240.00	-209.00
NOV	85.80	1.82	84.00	0.00	240.00	-156.00
DEC	153.00	2.12	151.00	0.00	200.00	-49.10
ANN	279,000.00	90,500.00	188,000.00	0.00	167,000.00	69,500.00

Well Location Map



Water-Level Trends in Nearby Wells

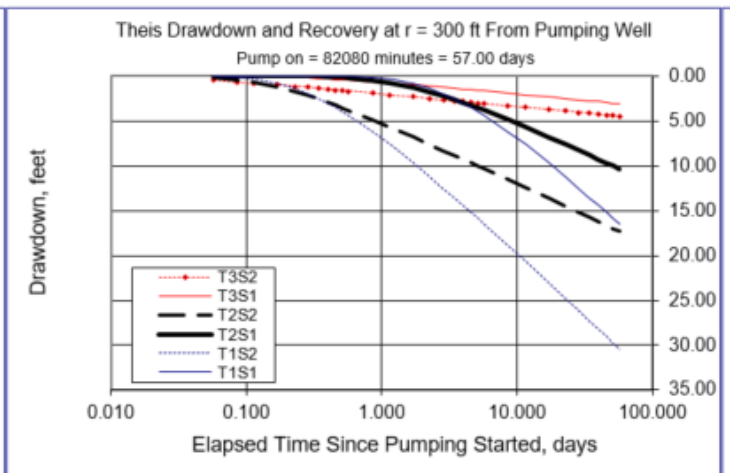
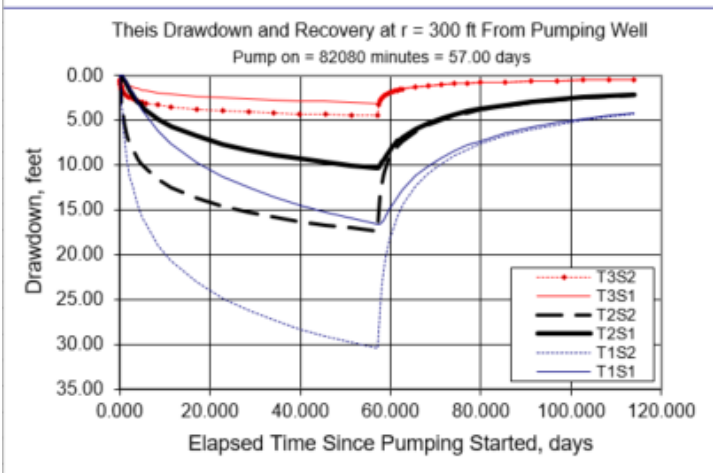
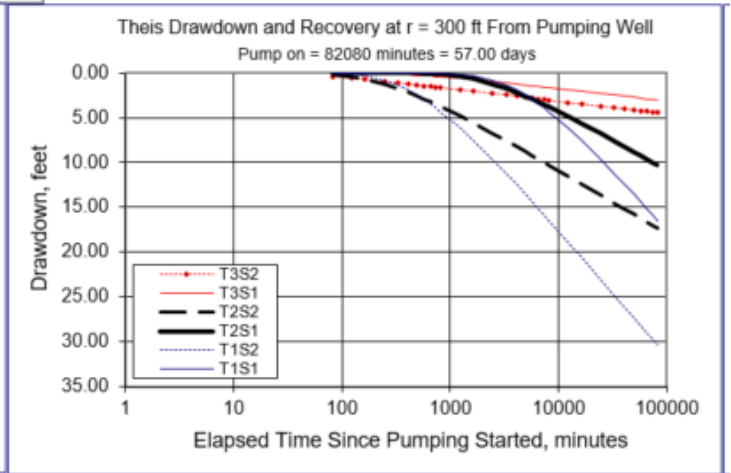
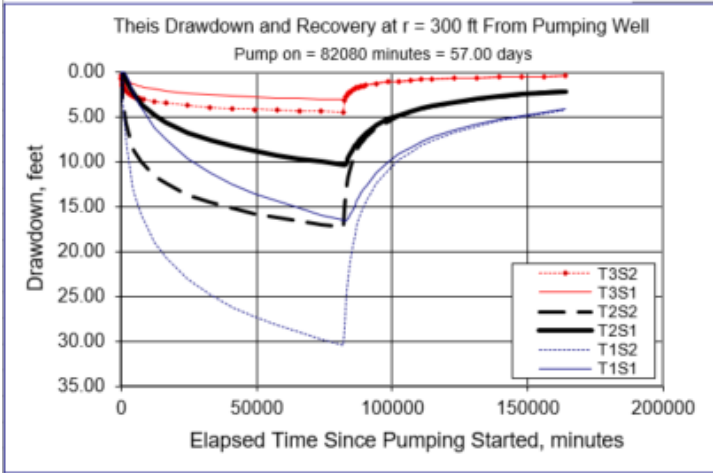


Theis (1935) Distance Drawdown Modeling Parameters and Results

Written by Karl C. Wozniak September 1992. Last modified December 30, 2014

Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units	
Total pumping time	t		57		d	
Radial distance from pumped well:	r		300.00		ft	Q conversions
Pumping rate	Q		20.000		gpm	20.00 gpm
Hydraulic conductivity	K	0.500	1.000	5.000	ft/day	0.04 cfs
Aquifer thickness	b		100		ft	2.67 cfm
Storativity	S_1		0.00500			3,850.27 cfd
	S_2		0.00050			0.09 af/d
Transmissivity Conversions	T_ft2pd	50	100	500	ft2/day	
	T_ft2pm	0.0347	0.0694	0.3472	ft2/min	
	T_gpdft	374	748	3,740	gpd/ft	

Recalculate Use the Recalculate button if recalculation is set to manual



Hunt (1999) Stream Depletion Model Parameters and Results

Application type:	G
Application number:	18931
Well number:	1
Stream Number:	1
Pumping rate (cfs):	0.045
Pumping duration (days):	244.0
Pumping start month number (3=March)	3.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	615	615	615	ft
Aquifer transmissivity	T	500	100	50	ft ² /day
Aquifer storativity	S	0.01	0.001	0.0001	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.05	0.1	ft/day
Not used		0	0	0	
Aquitard thickness below stream	babs	5	4	3	ft
Not used		0	0	0	
Stream width	ws	10	20	30	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270	300
Depletion (%)	38	12	9	59	69	74	78	80	81	83	84	29	17
Depletion (cfs)	0.02	0.01	0.00	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.01	0.01

