WATER RESOURCES DEPARTMENT

MEMO 8/17 /,2018

TO: **Application G-** 18541

FROM: **GW:** Joe Kemper
(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 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

MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager

From: Joel Jeffery, Well Construction Program Coordinator

Subject: Review of Water Right Application G-18541

Date: August 20, 2018

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

Applicant's Well #1 (JACK 16452): Based on a review of the Well Report, Applicant's Well #1 seems to protect the groundwater resource.

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

STATE OF OREGON

WATER WELL REPORT

(as required by ORS 537.765)

OCT 0 2 1989

WATER RESOURCES DEPT.
SALEM, OREGON

Jack 16452

38s/2w/12

(START CARD) # 12842

(1) OWNER:

Well Number:

Name BOBBIE ROSS

Address 1627 SKYVIEW DRIVE

City MEDFORD State OR Zip 97501

(2) TYPE OF WORK:

XX New Well ☐ Deepen ☐ Recondition ☐ Abandon

(3) DRILL METHOD

XX Rotary Air ☐ Rotary Mud ☐ Cable

☐ Other

(4) PROPOSED USE:

XX Domestic ☐ Community ☐ Industrial ☐ Irrigation

☐ Thermal ☐ Injection ☐ Other

(5) BORE HOLE CONSTRUCTION:

Special Construction approval Yes ☐ No XX Depth of Completed Well 365 ft.

Explosives used Yes ☐ No XX Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
10"	0	39	CEMENT	0	39	10SACKS
6"	39	365				

How was seal placed: Method ☐ A ☐ B XX C ☐ D ☐ E

☐ Other

Backfill placed from ft. to ft. Material

Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6"	+1	39	.250	XX	☐	XX	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s)

(7) PERFORATIONS/SCREENS:

☐ Perforations Method

☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

☐ Pump ☐ Bailer XX Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
20GPM	125	365	1 hr.

Temperature of water Depth Artesian Flow Found

Was a water analysis done? ☐ Yes By whom

Did any strata contain water not suitable for intended use? ☐ Too little

☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other

Depth of strata:

(9) LOCATION OF WELL by legal description:

County JACKSON Latitude ' " Longitude ' "

Township 38N N or S, Range 2W E or W, WM.

Section 12 ¼ ¼

Tax Lot 5403 Lot Block Subdivision

Street Address of Well (or nearest address) SAME AS #1

(10) STATIC WATER LEVEL:

240 ft. below land surface. Date 8-29-89

Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:

Depth at which water was first found 338

From	To	Estimated Flow Rate	SWL
338	352	20 GPM	240

(12) WELL LOG:

Ground elevation

Material	From	To	SWL
SOIL, BROWN	0	2	
CLAY, BROWN	2	12	
CLAYSTONE, BROWN	12	26	
CLAYSTONE, BLUE	26	230	
SANDSTONE, BLUE	230	365	240

Date started 8-28-89 Completed 8-29-89

(unbonded) Water Well Constructor Certification:

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

WWC Number

Signed MEDINA WELL DRILLING 3286 Hanley Rd Central Point OR 97502 Date

(bonded) Water Well Constructor Certification:

I accept responsibility for the construction, 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 well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 1207

Signed Joaquin Medina Date 8-29-89

ORIGINAL & FIRST COPY - WATER RESOURCES DEPARTMENT SECOND COPY - CONTRUCTOR THIRD COPY - CUSTOMER 9809C 3/88

UPPER BORE

		Depth	0	ft				
6.5	*inches*		39	ft		10	*inches*	
0.541667	*feet*		39	ft		0.833333333	*feet*	
WELL CASING						**BORE HOLE**		
DIA	0.541667	ft				DIA	0.833333	ft
RADI	0.270833	ft				RADI	0.416667	ft
RADI^2	0.073351	ft				RADI^2	0.173611	ft
DEPTH	39	ft				DEPTH	39	ft
PI	3.141					PI	3.141	
	8.985387	ft^3					21.26719	ft^3
	67.21069	gal					159.0786	gal
	560.5372	lbs					1326.715	lbs

ANNULS

Total Vol	12.2818	ft^3
Total Gal	91.86787	gal

TOTAL ANNULS

12.2818	ft^3
91.86787	gal

CEMENT Sacks (Lbs) required @

4	gal	16.81	lbs/gal	12.41	lbs/gal minus water	1139.897	lbs	**12.12656**
4.5	gal	16.28	lbs/gal	11.64	lbs/gal minus water	1069.342	lbs	**11.37598**
5	gal	15.82	lbs/gal	10.96	lbs/gal minus water	1006.964	lbs	**10.71238**
5.2	gal	15.65	lbs/gal	10.71	lbs/gal minus water	983.9968	lbs	**10.46805**
5.5	gal	15.41	lbs/gal	10.36	lbs/gal minus water	951.4755	lbs	**10.12208**
6	gal	15.04	lbs/gal	9.82	lbs/gal minus water	901.775	lbs	**9.593351**
6.5	gal	14.71	lbs/gal	9.33	lbs/gal minus water	857.0354	lbs	**9.117397**
7	gal	14.40	lbs/gal	8.89	lbs/gal minus water	816.5216	lbs	8.6864
7.5	gal	14.13	lbs/gal	8.49	lbs/gal minus water	779.6826	lbs	8.294496
8	gal	13.88	lbs/gal	8.12	lbs/gal minus water	745.9671	lbs	7.93582
8.5	gal	13.65	lbs/gal	7.78	lbs/gal minus water	715.0995	lbs	7.607441

CEMENT Sacks (Lbs) w/5% bentonite required @

Groundwater Application Review Summary Form

Application # G- 18541

GW Reviewer Joe Kemper **Date Review Completed:** 8/17/2018

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:

[X] 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.
JK 8/17/18

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).

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 8/17/2018

FROM: Groundwater Section Joe Kemper
Reviewer's Name

SUBJECT: Application G- 18541 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: **Tim Simpson** County: **Jackson**

A1. Applicant(s) seek(s) 0.1114 cfs from 2 well(s) in the Rogue Basin, Bear Creek subbasin

A2. Proposed use Irrigations (12.84 acres) Seasonality: April 1st to October 31st

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 16452	1	Bedrock	0.0557	38S/2W-S12 NW-NW	810' S, 844' E FR NW cor, S12
2	Proposed	2	Bedrock	0.0557	38S/2W-S12 NW-NW	31' S, 872' E FR NW cor, S12
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	1637	338	240*	8/29/1989	365	0-39	0-39	NA	NA	20	125	Air
2	1725	NA	NA*	NA	350	0-20	0-25	*	*	*	*	*

Use data from application for proposed wells.

A4. **Comments:** *The applicant's wells would access a bedrock aquifer where water is typically hosted in the upper weathered and fractured zones. SWLs are usually quite shallow. Figure 3 shows summary statistics of well log reports for adjacent wells; approximately 90% of SWLs measurements are less than 100 feet BLS. Additionally, when low yield wells are tested, water levels can take several days to recover fully. If depth to water is measured soon after a well test, the measurement is often much deeper than actual aquifer conditions. Considering these lines of evidence, this review will assume that SWLs in the target aquifer will be shallower than 100 feet.

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 provision.

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 (7-yr SWL); 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:** Well yields are typically low in this aquifer system; the median reported yield for wells in the adjacent 4 sections is 7 gpm (see Figure 3). There are very few SWL measurements within a mile of the proposed POA to identify long-term trends. Thus, there is not a preponderance of evidence to determine whether the resource is or is not over appropriated.

There are approximately 5 valid POAs within 1 mile of the applicant's wells, posing the risk of injury to senior users. However, tax lot density (as a proxy for domestic well development) is relatively high, and the Department is currently unaware of interference issues in the areas. As such, it is unlikely that the proposed use would cause significant injury to senior users.

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	**Bedrock of Hornbrook Fm**	☒	☐
2	**Bedrock of Hornbrook Fm**	☒	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The well log for Well 1 indicates "First Water" at 338 feet BLS and a SWL of 240 feet BLS (and is assumed to be shallower). The proposed well is likely to access similar conditions. Figure 3 also shows that nearby wells encounter similar confined conditions.

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	**Griffin Creek**	**>1537***	**1595**	**4290**	☒	☐	☐	☐	☒
2	1	**Griffin Creek**	**>1625***	**1605**	**4240**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: GW elevations are coincident with or higher than SW elevations, indicating that water is able to move between surface water and groundwater.

Note: the Talent Irrigation District reports that they use Crooked Creek as a conveyance to deliver appropriated water to customers downstream. As such, Crooked Creek is not considered in this review as a surface water source as per OAR 690-009.

*As per comments in section A4, this review assumes that SWLs in the aquifer are less than 100 feet BLS. The GW elevations in section C2 are calculated based on this assumption.

Water Availability Basin the well(s) are located within: BEAR CR > ROGUE R - AT MOUTH; also evaluated in GRIFFIN CR > BEAR CR - AT MOUTH

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	☐	☐	**IS71200A**	**0.40**	☒	**0.31**	☒	**<1%**	☒
2	1	☐	☐	**IS71200A**	**0.40**	☒	**0.31**	☒	**<1%**	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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?
	1		☐	**IS71200A**	**0.40**	☒	**0.31**	☒	**<1%**	☒
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: Pumping effects on adjacent surface water sources are evaluated using the Hunt (2003) stream depletion model with aquifer parameters representative of the local geology. Model parameters and results for the closest well-surface water source combination are presented in Figure 4.

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													
(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: Stream depletion was not evaluated for streams beyond 1 mile from the proposed POAs.

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 wells would produce from an aquifer system that has been determined to be hydraulically connected with surface water. The well specific rates (0.0557 cfs) and total proposed rate (0.1114 cfs) are greater than 1% of both the 80% exceedance flow (0.31 cfs) and the instream water right (0.40 cfs) in Griffin Creek. As such, the proposed use at the proposed rate is assumed to have the potential for substantial interference (PSI) as per OAR 690-009. The applicant could avoid triggering an assumption of PSI by reducing their well specific AND total rate to less than 0.0031 cfs or 1.39 gpm.

References Used:

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

OWRD Groundwater Site Information System Database – Accessed 8/17/2018.

Wiley, T. J., J. D. McClaughry, and J. A. D'Allura. 2011. *Geologic Database and Generalized Geologic Map of Bear Creek Valley, Jackson County, Oregon.* Oregon Dept. of Geology and Mineral Industries. OFR O-11-11.

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.**

Figure 1. Water Availability Tables

BEAR CR > ROGUE R - AT MOUTH
ROGUE BASIN

Water Availability as of 8/8/2018

Watershed ID #: 70993 (Map) Exceedance Level: 80%
Date: 8/8/2018 Time: 11:40 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	107.00	192.00	-85.40	0.00	170.00	-255.00
FEB	129.00	235.00	-106.00	0.00	170.00	-276.00
MAR	129.00	214.00	-85.20	0.00	170.00	-255.00
APR	105.00	31.00	74.00	0.00	170.00	-96.00
MAY	84.20	47.20	37.00	0.00	170.00	-133.00
JUN	61.60	73.40	-11.80	0.00	100.00	-112.00
JUL	28.10	94.20	-66.10	0.00	40.00	-106.00
AUG	19.30	79.80	-60.50	0.00	24.00	-84.50
SEP	17.10	56.50	-39.40	0.00	20.00	-59.40
OCT	18.30	18.10	0.17	0.00	24.00	-23.80
NOV	30.90	57.90	-27.00	0.00	62.00	-89.00
DEC	65.30	138.00	-72.30	0.00	153.00	-225.00
ANN	89,800.00	74,400.00	24,400.00	0.00	76,600.00	0.00

GRIFFIN CR > BEAR CR - AT MOUTH
ROGUE BASIN

Water Availability as of 8/13/2018

Watershed ID #: 71200 (Map) Exceedance Level: 80%
Date: 8/13/2018 Time: 10:35 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	4.60	0.03	4.57	0.00	10.00	-5.43
FEB	5.79	0.04	5.75	0.00	13.00	-7.25
MAR	5.43	0.03	5.40	0.00	11.00	-5.60
APR	3.64	0.14	3.50	0.00	7.00	-3.50
MAY	2.38	0.22	2.16	0.00	5.00	-2.84
JUN	1.56	0.31	1.25	0.00	3.00	-1.75
JUL	0.60	0.41	0.19	0.00	1.00	-0.81
AUG	0.37	0.34	0.03	0.00	0.50	-0.47
SEP	0.31	0.23	0.08	0.00	0.40	-0.32
OCT	0.35	0.08	0.27	0.00	0.50	-0.23
NOV	0.75	0.01	0.74	0.00	2.00	-1.26
DEC	2.44	0.02	2.42	0.00	7.00	-4.58
ANN	3,610.00	113.00	3,500.00	0.00	3,620.00	19.10

Figure 2. Well Location Map

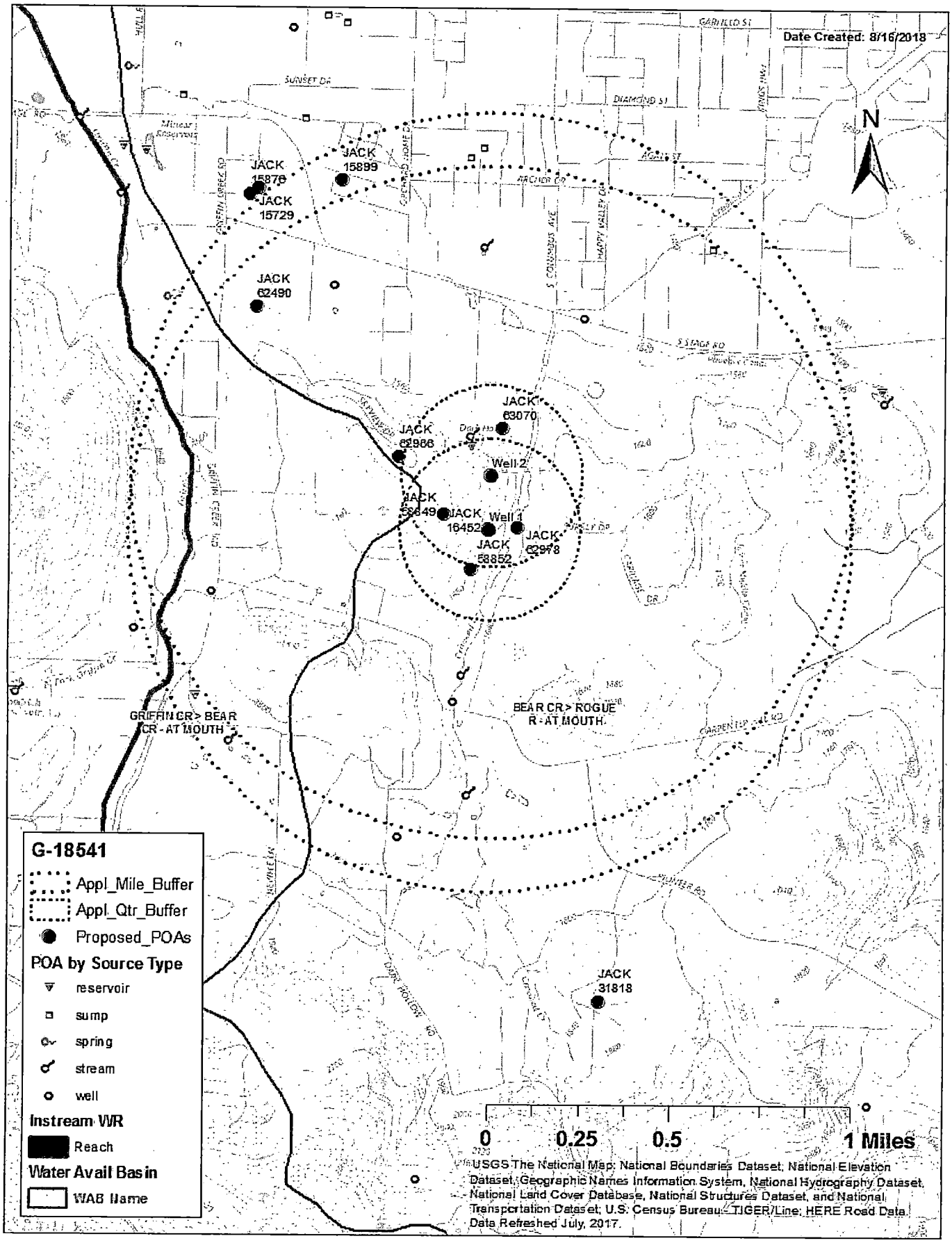

Figure 3. Well Log Summary Statistics for TRS 38S/2W-Sections 1, 2, 11 & 12

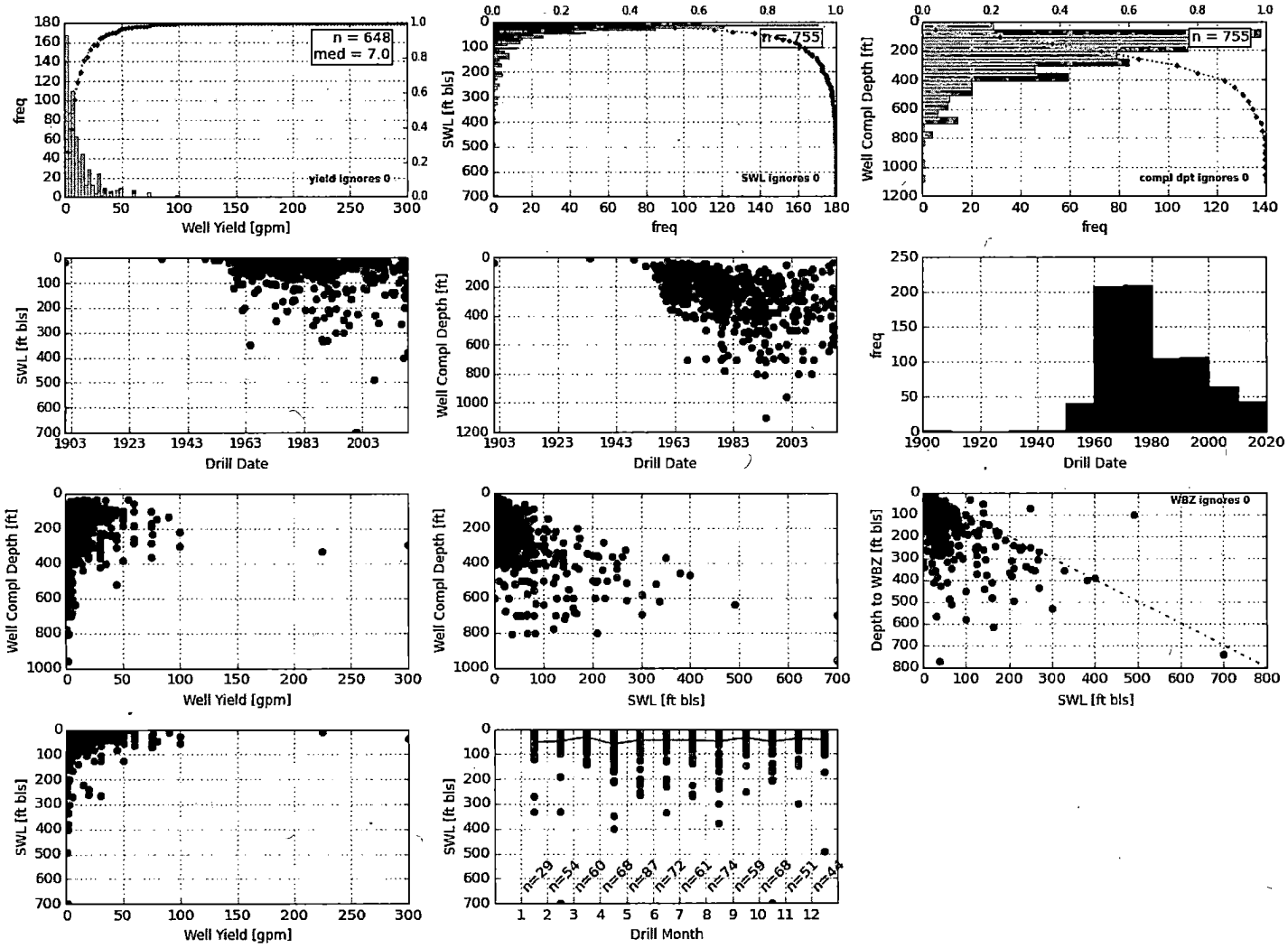

Figure 4. Stream Depletion Model

Application type:	G
Application number:	18541
Well number:	2
Stream Number:	1
Pumping rate (cfs):	0.0759
Pumping duration (days):	213

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	4240	4240	4240	ft
Aquifer transmissivity	T	100	500	1000	ft2/day
Aquifer storativity	S	0.1	.01	.001	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.05	0.1	ft/day
Aquitard saturated thickness	ba	10.0	20.0	30.0	ft
Aquitard thickness below stream	babs	4.0	3.0	2.0	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-
Stream width	ws	10	15	20	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	330	360
Depletion (%)	0	0	0	0	0	0	0	0	0	0	0	0	0
Depletion (cfs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00