

Groundwater Review Summary Form

Application # G- 18350

GW Reviewer M. Thomas Date Review Completed: 9/30/16

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 OAR 690-310.

Summary of Potential for Substantial Interference Review:

There is the potential for substantial interference per OAR 690-009.

Other:

Information on page ___ of the attached GW review may require denial of the application.

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 9/29/16
 FROM: Groundwater Section Michael J Thoma
Reviewer's Name
 SUBJECT: Application G- 18350 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: XP Investments LLC County: Jackson

A1. Applicant(s) seek(s) 1.96 cfs from 6 well(s) in the Rogue Basin,
Little Butte Cr 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	JACK 2914	1	Bedrock	1.96	35S/01W-27 NWSW	74'S & 1080'E of E ¼ cor S28
2	JACK 2916	3	Bedrock	1.96	35S/01W-28 NESE	944'S & 143'W of E ¼ cor S28
3	JACK 2913	4	Bedrock	1.96	35S/01W-28 NESE	1238'S & 898'W of E ¼ cor S28
4	JACK 2909	5	Bedrock	1.96	35S/01W-28 NESE	707'S & 420'W of E ¼ cor S28
5	JACK 2908	6	Bedrock	1.96	35S/01W-28 NESE	1158'S & 470'W of E ¼ cor S28
6	JACK 30158	7	Bedrock	1.96	35S/01W-27 NWSW	349'S & 911'E of E ¼ cor S28

* 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	1425	41	12	*	100	0-20	+1-39			32	61	B
2	1425	-	13	*	107	0-22	0-48		22-47	45	10	B
3	1460	104	10	*	175	0-20	+1-33			140	64	B
4	1435	113	36	*	165	0-20	+1-62	0-113		70	123	Jet
5	1435	94	47	*	200	0-19	+1-19			30	126	Jet
6	1425	182	10	*	300	0-76	+2-76	0-300	180-300	200		A

Use data from application for proposed wells.

A4. **Comments:** *SWLs are provided by the applicant but do not give a specific date, only a year (1998 for wells #1, #2, #4, #5 and 2016 for wells #3 and #6). SWLs reported on driller's logs range between approx. 10 and 50 ft for the wells listed on the application and between approx. 10 and 40 for most wells drilled in the area (see attached plots)

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: _____

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) _____;
 - 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:** Nearby well JACK 2932 has SWL data for the past five years but the data record is insufficient to provide a preponderance of evidence that groundwater in the area is or is not over-appropriated.

The applicant is proposing a maximum rate of 1.96 cfs (880 gpm) in an area where median well yields are approx. 15 gpm. Since the rate is not distributed among the wells the Department assumes than any one well could be used to pump the maximum rate. None of the well logs listed on the application report yields even close to 880 gpm but the applicant could potentially pump any one of the wells at its maximum or transfer to a different well with a higher yield. Pumping a well at such a high rate as proposed on this application (or even a lesser but still significantly high rate) in this area and aquifer has a high potential to significantly interfere with nearby groundwater users (either permitted rights or exempt rights) – there are few permitted groundwater rights in the area but over 200 wells in the surrounding four sections (27, 28, 33, and 34) suggesting abundant exempt use.

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 L. Butte Volcanics	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Bedrock of L. Butte Volcanics	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Bedrock of L. Butte Volcanics	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Bedrock of L. Butte Volcanics	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Bedrock of L. Butte Volcanics	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	Bedrock of L. Butte Volcanics	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: SWLs reported on well logs provided for this application are several feet above first water indicating 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?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Little Butte Cr	~1413	1280-1340	9450	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Little Butte Cr	~1412	1280-1340	9270	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	1	Little Butte Cr	~1450	1280-1340	9500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	1	Little Butte Cr	~1400	1280-1340	9670	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	1	Little Butte Cr	~1388	1280-1340	9310	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	1	Little Butte Cr	~1415	1280-1340	9240	<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"/>

Basis for aquifer hydraulic connection evaluation: GW elevations are above SW elevations which suggests that groundwater is flowing toward and discharging to surface water.

Water Availability Basin the well(s) are located within: Little Butte Cr > Rogue R – At Mouth (ID# 263)

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"/>

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"/>

Comments: No surface water sources were evaluated within 1 mile of the proposed POAs

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
6**	1	0.2 %	2.9 %	7.4 %	12 %	17 %	21 %	24 %	27 %	30 %	33 %	35 %	37 %
Well Q as CFS		0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Interference CFS*		<0.01	0.02	0.04	0.07	0.09	0.11	0.13	0.15	0.16	0.18	0.19	0.20
Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS		Pumping rate is not distributed											
Interference CFS													
(A) = Total Interf.		0.01	0.03	0.07	0.10	0.12	0.15	0.17	0.19	0.20	0.21	0.23	0.24
(B) = 80 % Nat. Q		133	206	236	297	141	82.5	73.9	70.7	45.9	23.3	34.4	60.8
(C) = 1 % Nat. Q		1.33	2.06	2.36	2.97	1.41	0.83	0.74	0.71	0.46	0.23	0.34	0.61
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	0.14%	0.18%	0.21%	0.36%	0.76%	0.55%	0.33%

(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: _____

***Comments:** Interference with surface water was estimated using the Hunt (1999) stream-depletion model run through the USGS Michigan Water Science Center web-based version. The model was run using parameter values expected for this type of geology. The model input page is attached and the website can be found at:
<http://mi.water.usgs.gov/software/groundwater/CalculateWell/index.html>

****Only Well #6 (JACK 30158)** was evaluated for PSI because it is the closest to the impacted surface water. Interference is inversely-proportional to distance so all other wells will have less interference with surface water

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 proposed wells would be producing from an aquifer that has been found to be hydraulically connected to surface water at a distance of > 1 mile. However, the department is unable to find sufficient evidence that the proposed use will have the Potential for Substantial Interference per OAR 690-009

Well #1 is located barely within the Rogue River WAB. However, the topography of the area across the basin divide is very flat and there is large rise (Long Mountain) located directly west of Well #1 and between the wells and the Rogue River. So although Well #1 is within the Rogue River WAB, hydraulic connection to the Rogue River will be small in comparison to connection to Little Butte Cr due to the topography so only Little Butte Cr. was evaluated for PSI.

References Used:

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

Reeves, H.W., 2008, STRMDEPL08—*An Extended Version of STRMDEPL with Additional Analytical Solutions to Calculate Streamflow Depletion by Nearby Pumping Wells*: U.S. Geological Survey Open-File Report 2008-1166, 22 p.

Wiley, T. K. and J. G. Smith. 1993. *Preliminary Geologic Map of the Medford East, Medford West, Eagle Point, and Sams Valley Quadrangles, Jackson County, Oregon*. Oregon Dept. of Geology and Mineral Industries. OFR O-93-13

OWRD Well Log Database – accessed 09/29/2016

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

LITTLE BUTTE CR > ROGUE R - AT MOUTH
ROGUE BASIN

Water Availability as of 9/29/2016

Watershed ID #: 263 [\(Map\)](#) Exceedance Level: 80%
 Date: 9/29/2016 Time: 11:48 AM

Water Availability Calculation
Consumptive Uses and Storages
Instream Flow Requirements
Reservations

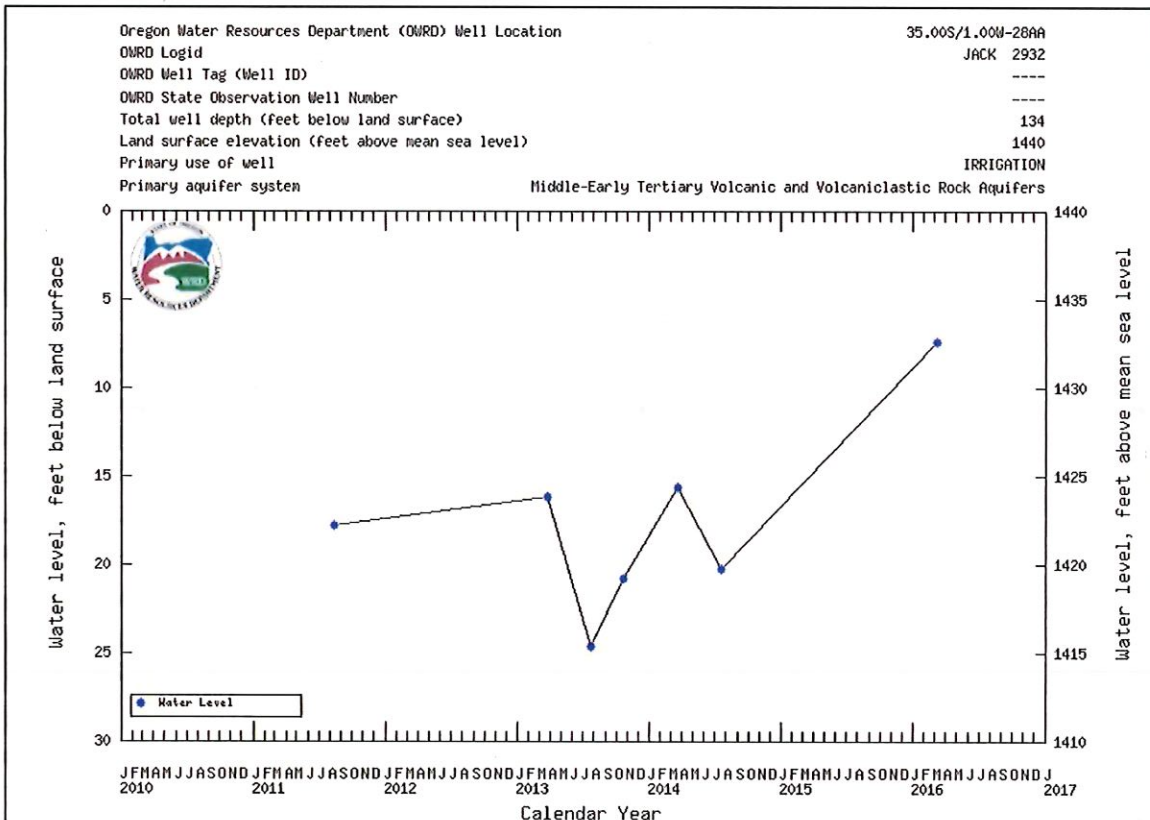
Water Rights
Watershed Characteristics

Water Availability Calculation

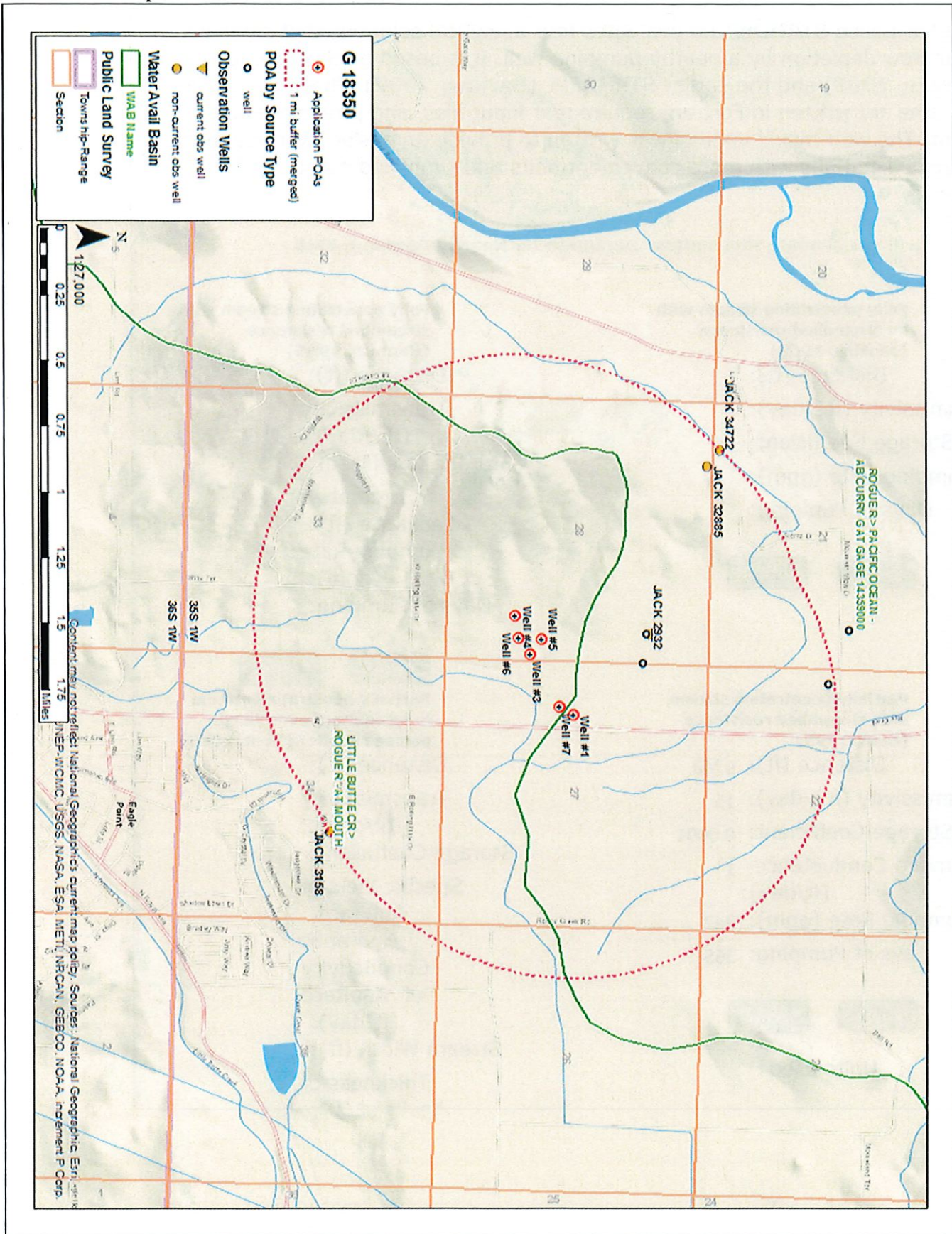
Monthly Streamflow in Cubic Feet per Second
 Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	133.00	44.20	88.80	0.00	100.00	-11.20
FEB	206.00	55.30	151.00	0.00	100.00	50.70
MAR	236.00	58.90	177.00	0.00	100.00	77.10
APR	297.00	17.80	279.00	0.00	100.00	179.00
MAY	141.00	30.90	110.00	0.00	60.00	50.10
JUN	82.50	48.90	33.60	0.00	20.00	13.60
JUL	73.90	69.80	4.05	0.00	20.00	-15.90
AUG	70.70	56.70	14.00	0.00	20.00	-6.03
SEP	45.90	35.40	10.50	0.00	120.00	-109.00
OCT	23.30	12.00	11.30	0.00	120.00	-109.00
NOV	34.40	22.10	12.30	0.00	100.00	-87.70
DEC	60.80	37.90	22.90	0.00	100.00	-77.10
ANN	153,000.00	29,600.00	123,000.00	0.00	57,800.00	82,800.00

Water Level Data



Well Location Map



Stream-depletion Model Input Page

The Web-Based STRMDEPL08 evaluates four analytical solutions that simulate streamflow depletion by a nearby pumping well. It is based on STRMDEPL08 (Reeves, 2008) and the earlier STRMDEPL (Barlow, 2000). These two earlier programs are written in Fortran, require text input files, and produce tabular output. The web-based version was written to provide an easier interface to the analytical solutions with more convenient units and simplified output. (View more...)

Calculate Streamflow Depletion by Nearby Pumping Well

Fully penetrating stream with no streambed resistance (Jenkins, 1968)

Distance (ft):

Transmissivity (ft²/day):

Storage Coefficient:

Pumping Rate (gpm):

Days of Pumping:

Fully penetrating stream with streambed resistance (Hantush, 1965)

Distance (ft):

Transmissivity (ft²/day):

Storage Coefficient:

Streambed Leakage (ft):

Pumping Rate (gpm):

Days of Pumping:

Partially penetrating stream with streambed resistance (Hunt, 1999)

Distance (ft):

Transmissivity (ft²/day):

Storage Coefficient:

Streambed Conductance (ft/day):

Pumping Rate (gpm):

Days of Pumping:

Units used

Partially penetrating stream in an aquitard overlying a pumped aquifer (Hunt, 2003)

Distance (ft):

Transmissivity (ft²/day):

Storage Coefficient:

Specific Yield of Aquitard:

Hydraulic Conductivity of Aquitard (ft/day):

Stream Width (ft):

Thickness of Aquitard (ft):

Well Log Statistics for Surrounding Area (Section 27, 28, 33, and 34)

