Groundwater Application Review Summary Form

Application # G- 18817

GW Reviewer Phil Marcy **Date Review Completed:** 4/25/2019

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.
BJ 4/25/19

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 4/25 ,20 19

TO: **Application G-** 18817

FROM: **GW:** Phil Marcy
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ YES
The source of appropriation is within or above a Scenic Waterway
☒ NO

☐ YES
Use the Scenic Waterway condition (Condition 7J)
☒ NO

☐ Per ORS 390.835, the Groundwater Section is **able** to calculate ground water interference with surface water that contributes to a Scenic Waterway. The calculated interference is distributed below.

☐ Per ORS 390.835, the Groundwater Section is **unable** to calculate ground water interference with surface water that contributes to a scenic waterway; **therefore, the Department is unable to find that there is a preponderance of evidence that the proposed use will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway.**

DISTRIBUTION OF INTERFERENCE

Calculate the percentage of consumptive use by month and fill in the table below. If interference cannot be calculated, per criteria in 390.835, do not fill in the table but check the "unable" option above, thus informing Water Rights that the Department is unable to make a Preponderance of Evidence finding.

Exercise of this permit is calculated to reduce monthly flows in _____ Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager

From: Joel Jeffery, Well Construction Program Coordinator

Subject: Review of Water Right Application G-18817

Date: April 29, 2019

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

Applicant's Well #1 (BAKE 50878): 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.

BAKE 50878

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the last page of this form.

WELL I.D. # L 50855
START CARD # 144573

(1) LAND OWNER Well Number
Name DOUG CRAWFORD
Address PO BOX 106
City OXBOW State OR Zip 97840

(2) TYPE OF WORK
☒ New Well ☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD:
☒ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger
☐ Other

(4) PROPOSED USE:
☒ Domestic ☐ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 100 ft.
Explosives used ☐ Yes ☒ No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
10"	0	19	BENTONITE	0	19	18 SACKS
6"	19	100				

How was seal placed: Method ☐A ☐B ☐C ☐D ☐E
☒ Other POURED DRY
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"	+2	99	.25	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☒ Outside ☐ None
Final location of shoe(s) 99'

(7) PERFORATIONS/SCREENS:
☒ Perforations Method TORCH
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
90	99	6"x1/4	12	6"		☒	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
25		100'	1 hr.

Temperature of water 54° 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 BAKER Latitude Longitude
Township 8 N or S Range 39 E or W. WM.
Section 18 NW 1/4 SE 1/4
Tax Lot 501 Lot Block Subdivision
Street Address of Well (or nearest address) 800' SOUTH OF POCAHANTAS ON NORTH SIDE OF SCHOOL HOUSE RD.

(10) STATIC WATER LEVEL:
48 ft. below land surface. Date 10-3-01
Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES:
Depth at which water was first found 65'

From	To	Estimated Flow Rate	SWL
67	100	25 GPM	48

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
TOP SOIL	0	2	
GRAVEL SAND &	2	—	
COBBLES	—	10	
TAN CLAY w/	10	—	
GRAVEL & COBBLES	—	54	
GRAVEL & TAN CLAY	54	67	
GRAVEL w/ SILTY	67	—	48
SAND & CLAY (wet)	—	100	48

RECEIVED
OCT 11 2001
WATER RESOURCES DEPT.
SALEM, OREGON

Date started 10-2-01 Completed 10-3-01

(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 water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
WWC Number
Signed 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 water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 1775
Signed Date 10-3-01

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 04/25/2019

FROM: Groundwater Section Phillip I. Marcy
Reviewer's Name

SUBJECT: Application G- 18817 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: **Doug and Carolyn Crawford Family Trust** County: **Baker**

A1. Applicant(s) seek(s) 0.078 cfs from 1 well(s) in the Powder Basin, _____ subbasin

A2. Proposed use Irrigation/Domestic (9 acres) Seasonality: March 1st – October 31st (245 days)

A3. Well and aquifer data **(attach and number logs for existing wells; mark proposed wells as such under logid)**:

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	BAKE 50878	1	Alluvium	0.078	8S/39E-18 NW-SE	800'S, 1710'W fr E ¼ cor S 18
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	3546	67	48	10/03/2001	100	19	0-90	NA	90-99	25	NA	Air

Use data from application for proposed wells.

A4. **Comments:** The applicant proposes to use existing domestic well to irrigate 9 acres in addition to domestic supply.

A5. ☒ **Provisions of the** Powder 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:** Based on water level data from nearby wells, the alluvial system in this area appears to respond to climate cycles and yearly variations in precipitation. The attached hydrograph depicts groundwater elevations versus yearly precipitation averages for NE Oregon. The record for BAKE 1864 displays some fluctuation in year to year water levels, rebounding to the highest elevation in 2013 after some decline in the mid-2000's. Declines again followed during the 2014-2015 drought years only to recently rebound again in early 2018.

The small volume of water requested on this application is not expected to overburden the alluvial aquifer system in this area, or cause injury to any nearby senior rights. The nearest senior right is 950' to the NNE, and calculations of expected drawdown as a result of the use proposed on this application were performed using a Theis time-drawdown model. Calculations resulted in a range of expected drawdowns of less than 2 feet over 245 days of pumping at a distance of 950'.

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	**Terrace and fan deposits**	☐	☒
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: There is no laterally continuous confining horizon above water-bearing zones in this area. Resulting static water levels are similar to depth of first water on most nearby logs, most notably in shallow wells.

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**Willow Creek**	**3498**	**3320-3400**	**8300**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Willow Creek is being evaluated here as the closest perennial surface water, as nearby Williams Creek and Hunt Creek have been evaluated as intermittent streams (R. Lusk Memo, 02/29/2016). Willow Creek flows across terrace and fan deposits which are poorly sorted, and are unlikely to contain any horizon which would inhibit vertical movement of groundwater.

Water Availability Basin the well(s) are located within: Willow Cr > Powder R – At Mouth (ID# 30920328)

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?
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

C3b. **690-09-040 (4):** Evaluation of stream impacts by total appropriation for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells**. Otherwise same evaluation and limitations apply as in C3a above.

	SW #		Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: This section does not apply, as no perennial surface water is being evaluated for PSI within one mile.

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**	**4.6 %**	**4.2 %**	**1.2 %**	**2.3 %**	**3.2%**	**3.9%**	**4.6 %**	**5.2 %**	**5.8 %**	**6.3 %**	**5.8 %**	**5.1 %**
Well Q as CFS		**0**	**0**	**0.078**	**0.078**	**0.078**	**0.078**	**0.078**	**0.078**	**0.078**	**0.078**	**0**	**0**
Interference CFS		**.004**	**.003**	**.001**	**.002**	**.002**	**.003**	**.004**	**.004**	**.005**	**.005**	**.005**	**.004**

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													

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(A) = Total Interf.	**.004**	**.003**	**.001**	**.002**	**.002**	**.003**	**.004**	**.004**	**.005**	**.005**	**.005**	**.004**
(B) = 80 % Nat. Q	**2.13**	**2.70**	**2.85**	**4.82**	**8.60**	**7.46**	**2.30**	**1.12**	**0.78**	**0.78**	**1.60**	**2.02**
(C) = 1 % Nat. Q	**.021**	**.027**	**.029**	**.048**	**.086**	**.075**	**.023**	**.011**	**.008**	**.008**		
(D) = (A) > (C)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100	**.19 %**	**.11 %**	**.035%**	**.041%**	**.023%**	**.04 %**	**.174%**	**.357%**	**.641%**	**.641%**	**.313%**	**.198%**

(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: For this evaluation, a transient stream depletion model was used following the method of Hunt (1999), which accounts only for a streambed clogging layer, but no saturated aquitard.

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:** Due to the distance between the proposed POA well and Willow Creek, low volume of water requested, and likely deposits of fine-grained alluvium lining the stream channel, impacts to local perennial surface waters are likely to be negligible resulting from the proposed use.

References Used:

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

Brooks, H.C., McIntyre, J.R., Walker, G.W., 1976, Geology of the Oregon part of the Baker 1 degree by 2 degree quadrangle, Geologic Map Series GMS-7, Oregon Department of Geology and Mineral Industries, Portland, OR., map scale 1:250,000.

Watermaster memo regarding perennial flow in Williams and Hunt Creeks, Rick Lusk 02/29/2016

Local well logs, GWIS groundwater database

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** _____ **Logid:** _____

D2. **THE WELL does not appear to meet current well construction standards based upon:**

a. ☐ review of the well log;
b. ☐ field inspection by _____;
c. ☐ report of CWRE _____;
d. ☐ other: (specify) _____

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

D4. ☐ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

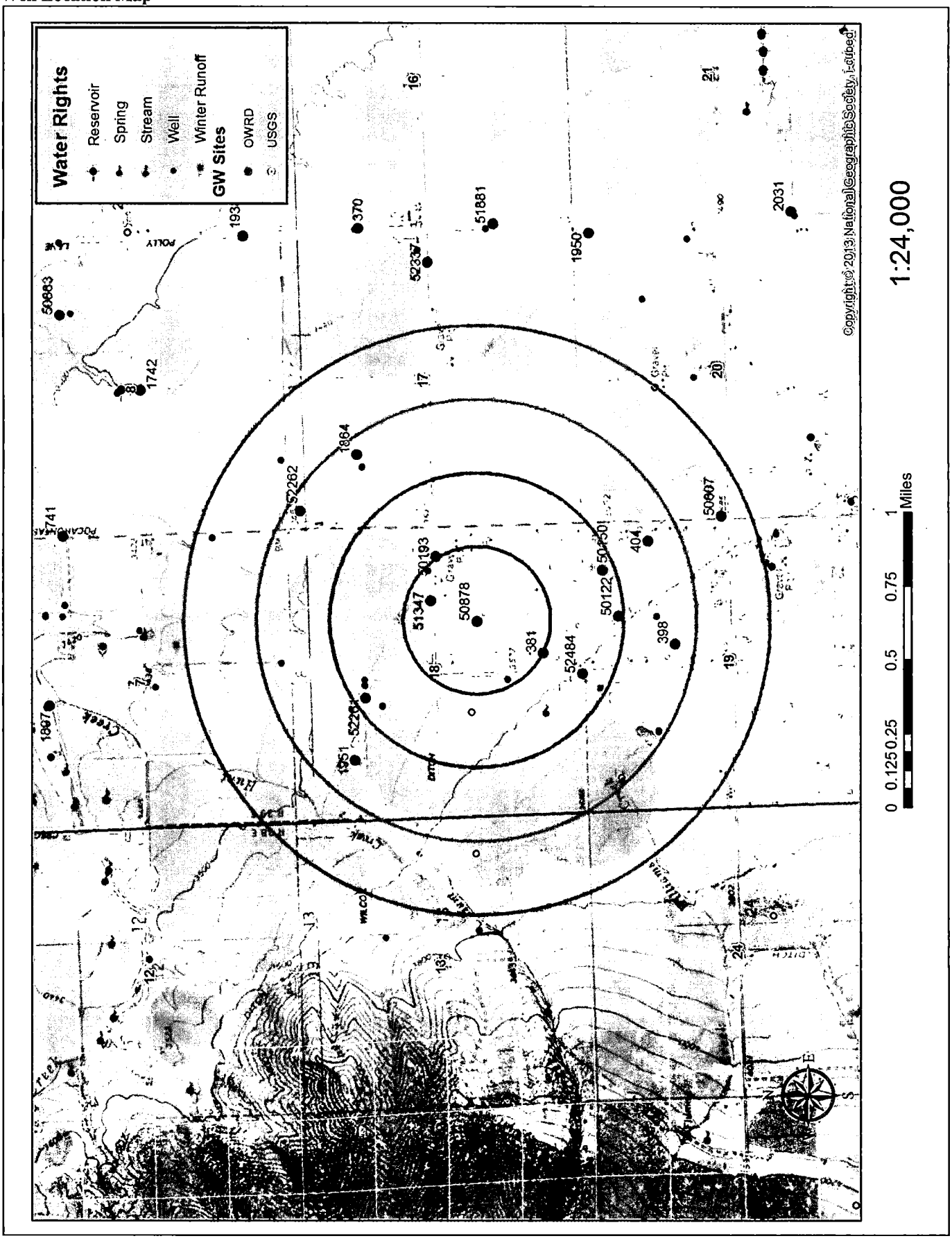
Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

WILLOW CR > POWDER R - AT MOUTH
Watershed ID #: 30920328 Basin: POWDER Exceedance Level: 80
Time: 1:38 PM Date: 04/25/2019

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
	Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.					
JAN	2.13	0.08	2.05	0.00	0.00	2.05
FEB	2.70	0.08	2.62	0.00	0.00	2.62
MAR	2.85	0.08	2.77	0.00	0.00	2.77
APR	4.82	5.25	-0.43	0.00	0.00	-0.43
MAY	8.60	32.30	-23.70	0.00	0.00	-23.70
JUN	7.46	38.50	-31.00	0.00	0.00	-31.00
JUL	2.30	17.40	-15.10	0.00	0.00	-15.10
AUG	1.12	5.03	-3.91	0.00	0.00	-3.91
SEP	0.78	2.64	-1.86	0.00	0.00	-1.86
OCT	0.78	0.08	0.70	0.00	0.00	0.70
NOV	1.60	0.08	1.52	0.00	0.00	1.52
DEC	2.02	0.08	1.94	0.00	0.00	1.94
ANN	3,830	6,150	1,360	0	0	1,360

Well Location Map



Water-Level Trends in Nearby Wells