Groundwater Application Review Summary Form

Application # G- 18741

GW Reviewer Phil Marcy **Date Review Completed:** 12/12/2018

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:

[ ] 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.
pr 12/17/18

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).

WATER RESOURCES DEPARTMENT

MEMO 12/12 ,20 18

TO: **Application G-** 18741

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-18741

Date: December 19, 2018

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 (UNIO 52714): Based on a review of the Well Report, Applicant's Well #1 does not appear to comply with current minimum well construction standards (See OAR 690 Division 210). In order to meet the minimum well construction standards, the well must be continuously cased and continuously sealed to a minimum depth of 528 feet below land surface.

My recommendation is that the Department **not issue** a permit for Applicant's Well #1 (UNIO 52714) unless it is brought into compliance with current minimum well construction standards or information is provided showing that it is in compliance with current minimum well construction standards.

The construction of 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)

UNIO 52714

10/18/2018

WELL I.D. LABEL# L 131376
START CARD # 1039853
ORIGINAL LOG #

(1) LAND OWNER

Owner Well I.D.
First Name SAM Last Name BAKER
Company
Address 59257 HIGH VALLEY RD
City UNION State OR Zip 97883

(2) TYPE OF WORK

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

(2a) PRE-ALTERATION

	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
Casing:									

	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

[ ] Domestic [ ] Irrigation [ ] Community
[ ] Industrial/ Commericial [ ] Livestock [ ] Dewatering
[ ] Thermal [ ] Injection [X] Other TEST WELL

(5) BORE HOLE CONSTRUCTION

Special Standard [X] (Attach copy)
Depth of Completed Well 600.00 ft.

BORE HOLE

Dia	From	To
12	0	42
8	42	600

SEAL

Material	From	To	Amt	sacks/lbs
Bentonite	0	42	22	S
		Calculated	21	
Bentonite	42	420	10225	P
		Calculated	10000	

How was seal placed: Method [ ] A [X] B [ ] C [ ] D [ ] E
[X] Other POURED DRY
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 10000.00 Pounds Actual Amount 10225.00 Pounds

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
●	○	8	X	2	42	0.25	●	○	X	
○	○						○	○		
○	○						○	○		
○	○						○	○		
○	○						○	○		

Shoe [ ] Inside [ ] Outside [ ] Other Location of shoe(s)
Temp casing [ ] Yes Dia From + To

(7) PERFORATIONS/SCREENS

Perforations Method
Screens Type Material

Perf/ Screen	Casing/ Screen Liner	Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size

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

( ) Pump ( ) Bailer (●) Air ( ) Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
400		575	1

Temperature 63 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount 77 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)

County UNION Twp 4.00 S N/S Range 40.00 E E/W WM
Sec 22 SW 1/4 of the NW 1/4 Tax Lot 4501
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
( ) Street address of well (●) Nearest address
59257 HIGH VALLEY RD
UNION, OR 97883

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	8/9/2018	22	X	50.8

Flowing Artesian? [X] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 277.00

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
8/8/2017	277	319	5			34
8/8/2017	386	392	40			34
8/9/2018	555	600	400	22	X	

(11) WELL LOG

Ground Elevation

Material	From	To
SOIL	0	2
BROWN CLAY, GRAVEL, BROKEN ROCK	2	12
BASALT, BROWN, FRACTURED	12	44
BASALT, TAN, FRACTURED	44	56
BASALT, BROWN	56	63
BASALT, GRAY, FRACTURED	63	108
BASALT, BROWN, FRACTURED	108	125
BASALT, TAN, FRACTURED	125	149
BASALT, BROWN, FRACTURED	149	157
RED CINDERS, FRACTURED BASALT	157	168
BASALT, BROWN CLAY, FRACTURED	168	192
BASALT, TAN, FRACTURED	192	204
BASALT, GRAY/GREEN, FRACTURED	204	214
BASALT, BROWN/RED, FRACTURED	214	228
BASALT,TAN, RED CINDERS, FRACTURED	228	241
BASALT, GRAY/GREEN, FRACTURED	241	254
BASALT, BROWN, FRACTURED	254	277
BASALT, TAN, FRACTURED	277	319
BASALT, TAN, RED CINDER, FRACTURED	319	329

Date Started 8/8/2018 Completed 10/4/2018

(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 1964 Date 10/16/2018
Signed REESE ACQUISTAPACE (E-filed)

(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 1775 Date 10/18/2018
Signed JASON ACQUISTAPACE (E-filed)
Contact Info (optional)

ORIGINAL - WATER RESOURCES DEPARTMENT

THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK Form Version:

WATER SUPPLY WELL REPORT - continuation page

UNION 52714

10/18/2018

WELL I.D. LABEL# L	131376
START CARD #	1039853
ORIGINAL LOG #	

(2a) PRE-ALTERATION

Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

Material	From	To	Amt	sacks/lbs

(5) BORE HOLE CONSTRUCTION

BORE HOLE Dia	From	To

SEAL Material	From	To	Amt	sacks/lbs
Cement with 3% Bentor	420	432	4	S
		Calculated	3.5	
		Calculated		
		Calculated		
		Calculated		

FILTER PACK

From	To	Material	Size

(6) CASING/LINER

Casing Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

(7) PERFORATIONS/SCREENS

Perf/ Screen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size

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

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)

Water Quality Concerns

From	To	Description	Amount	Units

(10) STATIC WATER LEVEL

SWL Date	From	To	Est Flow	SWL(psi)	+ SWL(ft)

(11) WELL LOG

Material	From	To
BASALT, GRAY/GREEN, FRACTURED	329	340
BASALT, TAN, RED CINDER, FRACTURED	340	352
BASALT, GRAY/GREEN, FRACTURED	352	372
BASALT,TAN/RED	372	386
RED CINDERS	386	392
BASALT, TAN, FRACTURED	392	407
BASALT, BLACK, HARD	407	454
BASALT, GRAY/GREEN, FRACTURED	454	462
GREEN CLAY STONE, BROKEN BASALT	462	471
BASALT, GREEN CLAY STONE, FRACTURED	471	493
BASALT, BLACK, GREEN/TAN CLAY	493	523
GREEN CLAY, BASALT, TAN	523	555
RED CINDERS,BASALT BROKEN,GREEN CLAY	555	583
BASALT, RED/GREEN, FRACTURED	583	591
BASALT, BROKEN, RED/GREEN	591	600

Comments/Remarks

The test well was drilled on 8/8/18 & 8/9/18. It free flowed 150 GPM with a shut in pressure of 22 PSI. Upon shutting the well in water started coming out of the ground around the well. Bob Maynard, Eric Thomasser, Phil Marcy & Shad Hatton came out to camera the well. We place wood plugs and bentonite from 432ft to 457ft to stop the artesian flow and set a cement seal from 420ft to 432ft. We abandon the well from 42ft to 422ft with bentonite and resealed the hole around the 8" casing.

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 12/12/2018

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

SUBJECT: Application G- 18741 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: **Samuel & Debra Baker, Lyman Baker** County: **Union**

A1. Applicant(s) seek(s) 2.7 cfs from 1 well(s) in the Grande Ronde Basin, subbasin

A2. Proposed use: Irrigation (149.9 acres); Supplemental Irrigation (66.5 acres) Seasonality: March 1st – October 31st (245days)

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	UNIO 52714	1	Bedrock	2.7	4S/40E-22 SW-NW	1703'S, 620'E fr NW cor S 22
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	2978	277	-50.82*	08/09/2018	600	"5' into basalt"	unknown	unknown	unknown	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** The proposed POA construction differs from that of the completed well (UNIO 52714) at the proposed location. This well was originally drilled as a test hole to 600' in depth, encountering high artesian pressure below 550' in depth. At the present time, the lower portions of the well (below 42' BLS) have been sealed off, preventing commingling of confined groundwater with upper zones in the unconfined alluvium. The intent stated on this application is to develop groundwater solely from the deeper, confined groundwater within the CRBG aquifer system. *Shut-in pressure measured by driller before lower portions of the well were abandoned.

A5. ☒ **Provisions of the** Grande Ronde 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) **7N; "Large Water Use Reporting"**;
   ii. ☒ The permit should be conditioned as indicated in item 2 below.
   iii. ☐ The permit should contain special condition(s) as indicated in item 3 below;

B2. a. ☐ **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;

b. ☐ **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;

c. ☒ **Condition** to allow groundwater production only from the **Columbia River Basalt Group (CRBG)** groundwater reservoir between approximately **555** ft. and **600** 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): As stated above, the applicant's intention is to further develop the existing borehole, and intends to seal "5' into basalt". During a downhole video survey conducted by Department staff, it was discovered that the borehole had caved in at a depth of 465', preventing access to the lower portion of the hole. Notable, however, is the existence of this interflow zone, which may serve as a conduit for groundwater movement out of the borehole under high artesian pressure. Therefore, it is recommended that the hole be continuously cased and sealed to a depth below this interflow horizon. Analysis of cuttings sampled at the time of drilling indicates that cinders were encountered at ~545' BLS, but fairly competent rock exists at depths between 500-530'. The well shall be continuously cased and sealed at least 5' into competent rock overlying the production zone, which based upon available evidence at this location is no less than 505' BLS.

B3. **Groundwater availability remarks:** There are no nearby wells that penetrate to similar depths, nor encounter similar artesian pressure. No applicable groundwater level data exists to evaluate the long-term trend of this resource.

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	**Interflow zones of Grande Ronde Basalt of CRBG**	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The static elevation of groundwater in the proposed aquifer is hundreds of feet above where it is encountered within the well.

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**	**Little Creek**	**3028**	**2880-3100***	**430**	☐	☒	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: The geologic units producing groundwater under high artesian pressure to the proposed POA well are not exposed for many miles in the area around the well location. Nearby springs located in the hills around the proposed POA location emerge from the Mt. Emily Dacite at elevations significantly higher than that experienced within the well (all greater than 3200' AMSL), and likely result from horizontal movement of groundwater that emerges as the dacite is incised by local drainages. *Elevation range within 1 mile.

Water Availability Basin the well(s) are located within: LITTLE CR > CATHERINE CR - AT MOUTH (ID# 71680)

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.

C4a. **690-09-040 (5):** Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells

Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													

Distributed Wells

Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													

(A) = Total Interf.												
(B) = 80 % Nat. Q												
(C) = 1 % Nat. Q												
(D) = (A) > (C)												
(E) = (A / B) x 100	%	%	%	%	%	%	%	%	%	%	%	%

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

Basis for impact evaluation: This section does not apply.

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:**

References Used:

Ferns, M. L., McConnell, V. S., Madin, I. P., and Johnson, J. A., 2010, Geology of the upper Grande Ronde River basin, Union County, Oregon; Oregon Department of Geology and Mineral Industries Bulletin 107, scale 1:100,000, 65 p.

Ham, H.H., 1966, Development Potential of Ground Water for Irrigation in the Grande Ronde Valley, Union County, Oregon: Bureau of Reclamation.

Local well logs, downhole well video, cuttings provided by driller, geochemical data for volcanic intervals, application file G-18741.

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

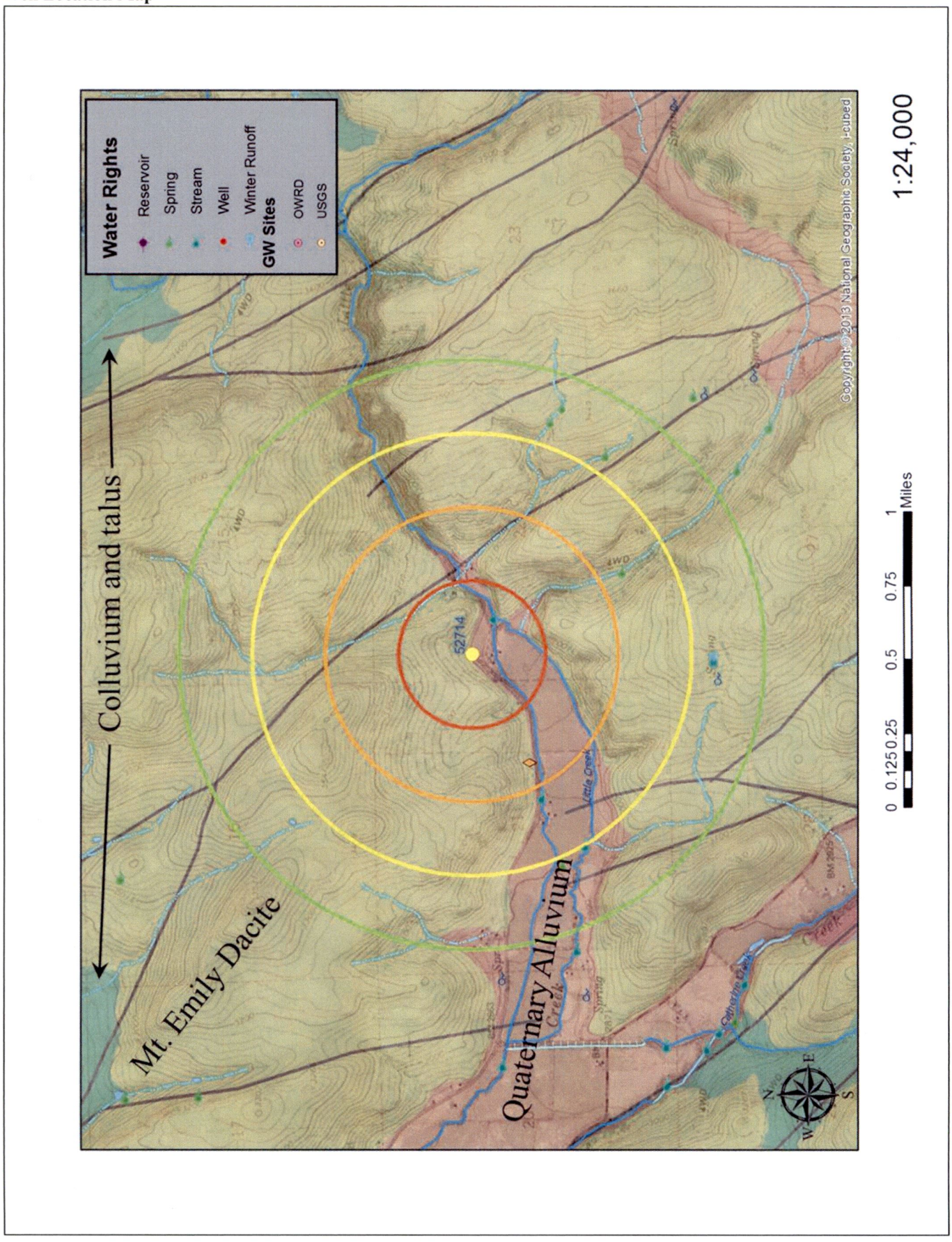
DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

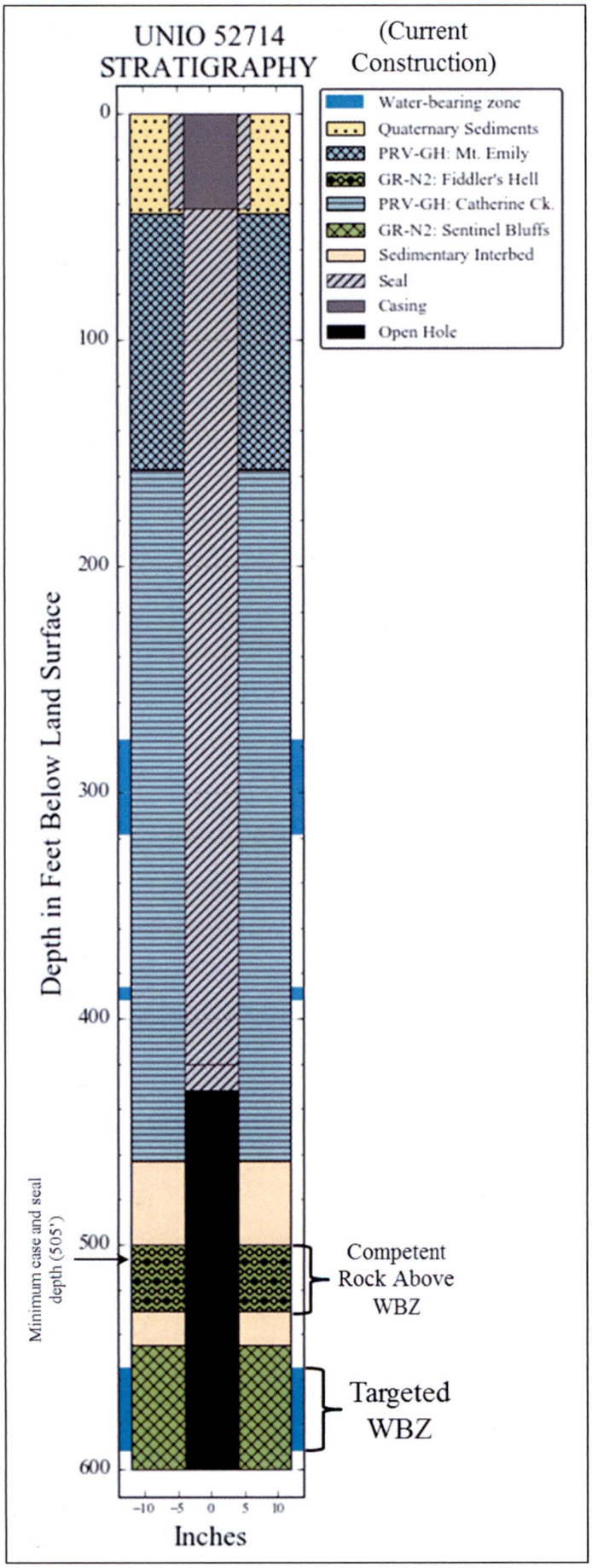
LITTLE CR > CATHERINE CR - AT MOUTH
Watershed ID #: 71680 Basin: GRANDE RONDE Exceedance Level: 80
Time: 4:09 PM Date: 12/12/2018

Monthly values are in cfs.
Storage is the annual amount at 50% exceedance in ac-ft.

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
JAN	3.01	0.20	2.81	0.00	12.50	-9.69
FEB	5.54	0.20	5.34	0.00	20.00	-14.70
MAR	10.40	0.20	10.20	0.00	26.50	-16.30
APR	20.50	2.56	17.90	0.00	34.00	-16.10
MAY	27.10	14.50	12.60	0.00	34.00	-21.40
JUN	11.30	17.30	-5.98	0.00	20.00	-26.00
JUL	3.32	7.91	-4.59	0.00	12.90	-17.50
AUG	0.98	2.40	-1.42	0.00	7.38	-8.80
SEP	1.16	1.34	-0.18	0.00	5.76	-5.94
OCT	1.24	0.20	1.04	0.00	7.38	-6.34
NOV	2.53	0.20	2.33	0.00	6.80	-4.47
DEC	2.61	0.20	2.41	0.00	9.74	-7.33
ANN	9,630	2,860	7,010	0	11,900	353

Well Location Map




UNIO 52714
STRATIGRAPHY
(Current
Construction)
Water-bearing zone
Quaternary Sediments
PRV-GH: Mt. Emily
GR-N2: Fiddler's Hell
PRV-GH: Catherine Ck.
GR-N2: Sentinel Bluffs
Sedimentary Interbed
Seal
Casing
Open Hole
Depth in Feet Below Land Surface
0
100
200
300
400
500
600
Minimum case and seal depth (505')
Competent Rock Above WBZ
Targeted WBZ
-10
-5
0
5
10
Inches