

Groundwater Application Review Summary Form

Application # G- 18881

GW Reviewer Karl Wozniak Date Review Completed: 1-29-2020

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.

✓
2/7/20

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 January 29, 2020
 FROM: Groundwater Section Karl Wozniak
 Reviewer's Name
 SUBJECT: Application G- 18881 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: Jacob Savage County: Clackamas

A1. Applicant(s) seek(s) 0.14 cfs from 1 well(s) in the Willamette Basin,
Molalla & Milk Creek 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	CLAC 71848	1	Basalt	0.14	4S/2E-13 NW/SW	2170' N, 990' E fr SW cor S 13
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	710	6	96	11/25/2015	161	0-95	0-95	84-161	147-160	30	--	A

Use data from application for proposed wells.

A4. **Comments:** The applicant seeks 0.14 cfs (63 gpm) from 1 well for year-round nursery use on 5.7 acres. The requested maximum annual use is 28.5 acre feet (5 acre feet/acre).

A5. **Provisions of the** Willamette 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 well does not produce groundwater from unconfined alluvium so the pertinent basin rules (OAR 690-502-0240) do not apply.

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; maximum rate = 0.0892 cfs ;
 - 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 Boring Lava 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 proposed POA is located in dissected uplands northeast of the Molalla River about 5.5 miles northeast of Molalla, Oregon. The local area is underlain by a number of basalt lava flows of the Boring volcanic field which were erupted from local vents. Local well logs (mostly basalt wells) indicate a positive correlation between water levels and well depth as well as between water levels and depth of the associated water-bearing zones. Geologic maps show that the contact between the base of the Boring lavas and the underlying Troutdale Formation sediments occurs at an elevation of about 600 feet at about 1/3 to 1/4 of a mile west and south of the well, consistent with the deepest water-bearing zone in the well at an elevation of about 555-600 feet (depths of 614-155 feet). Springs and the headwaters of some local streams occur at or near the basal contact of the lavas where they overlie Troutdale Formation. Springs also occur at higher levels within the basalt consistent with water well reports of multiple water-bearing zones. These facts indicate local recharge to the basalt groundwater system and discharge to local streams, likely concentrated at locations where local streams cross the contacts between sequential basalt flows and the basalts and the underlying sediments.

The OWRD well log database contains well logs for about 50 wells in sections 13 and 14 of T4S/2E. Reported well yields range from 6-54 gpm but are skewed toward the low end. The median well yield is 18 gpm. The well log for the proposed POA, CLAC 71848, indicates an air test yield of 30 gpm (0.0668cfs), about half the proposed maximum rate of 0.14 cfs (63 gpm). Air tests tend to overestimate the yield of completed wells. These facts suggest that it is highly unlikely that the well is capable of sustained yields at the proposed rate. However, it is possible that that the well can sustain rates approaching 40 gpm (0.0892 cfs) which is the highest rate of a likely permit based on surface water availability tables.

There are no nearby observation wells in the Boring lavas so water-level trends over time cannot be easily assessed. The OWRD water-rights database indicates that there are no permitted irrigation wells within a one-mile radius of the proposed POA. The OWRD well log database and tax lots indicate that domestic well density is relatively low but tax lots and aerial imagery indicate about 1 dozen rural domestic residences within ¼ mile of the proposed POA. Most of these residences are dependent upon basalt wells for their water supply although some may produce from water-bearing zones in the underlying Troutdale. Although the precise locations of these wells ~~is-are~~ not known, the proposed POA will likely interfere with nearby basalt wells completed in the same water-bearing zone; ~~but~~ however, the degree ~~if-of~~ interference is difficult to assess because of the complex geometry of the aquifer system (the thickness and extent of water-bearing zones in the basalts are expected to be quite variable as the lavas flowed onto a surface with pre-existing topography). Although the recommended maximum rate is relatively low, the low median yield of wells in the area indicate that it would be prudent to include water-level and water-use reporting conditions if a permit is issued by the Department.

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	Boring Lava	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer confinement evaluation: The well log for CLAC 71848 reports a static water level of 96 feet which is coincident with the top of the water-bearing zone of the completed well. Other nearby wells show some degree of confinement which would be expected in a multi-layered lava field.

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	Unnamed trib to Buckner Cr	614	360-600	2230	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	Cedar Creek	614	340-730	3300	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	3	Unnamed trib to Buckner Cr	614	600-740	3430	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: Groundwater elevation at the well is at or above the elevations of some local stream reaches. SW#1 becomes perennial at the geologic contact between the base of the Boring Lava and the underlying Troutdale Formation at about 2230 feet west of the well. A permitted spring (certificate 43106, POD 2) occurs near the same contact on SW#3 at about 1 mile north of the well. These facts indicate discharge of groundwater to local streams from the Boring lavas.

Water Availability Basin the well(s) are located within:
MILK CR > MOLALLA R - AT MOUTH WILLAMETTE BASIN

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	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	8.92	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
1	2	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	8.92	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
1	3	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	8.92	<input checked="" type="checkbox"/>		<input checked="" 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: Table C3b is not applicable as there is only 1 proposed well. Interference @ 30 days was not calculated because of the lack of a readily available model to simulate impacts in a complex geologic environment. **PSI can be avoided if the maximum rate is limited to 0.0892 cfs.**

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													
(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: All impacts are expected to be limited to the streams listed in table C3a.

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:

Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005, Ground-water hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

Gannett, M.W. and Caldwell, R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A, 32 p.

Leonard, A.R., and Collins, C.A., 1983, Ground water in the northern part of Clackamas County, Oregon: Oregon Water Resources Department Ground Water Report 29. 85 p.

Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82 p.

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.**

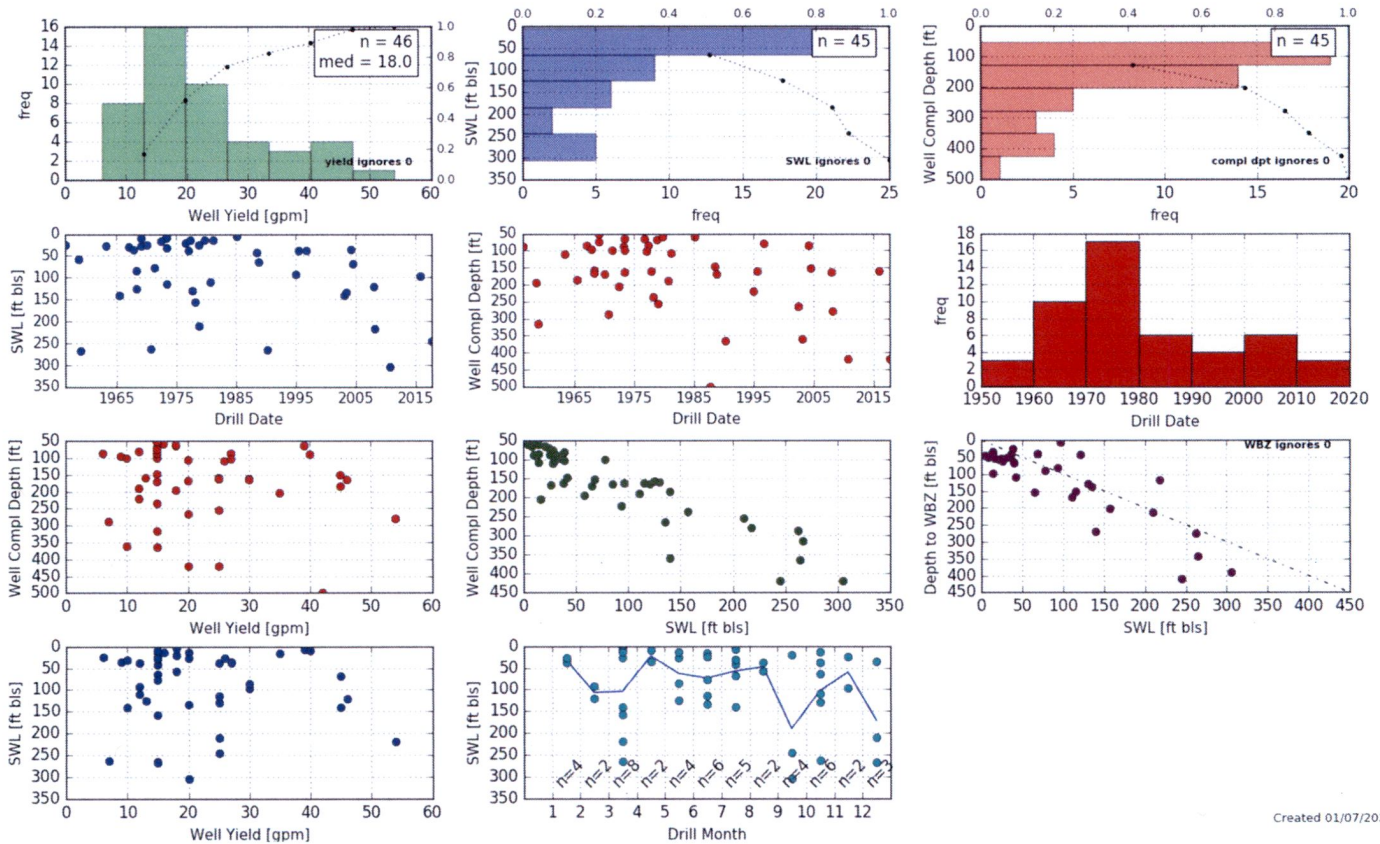
Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

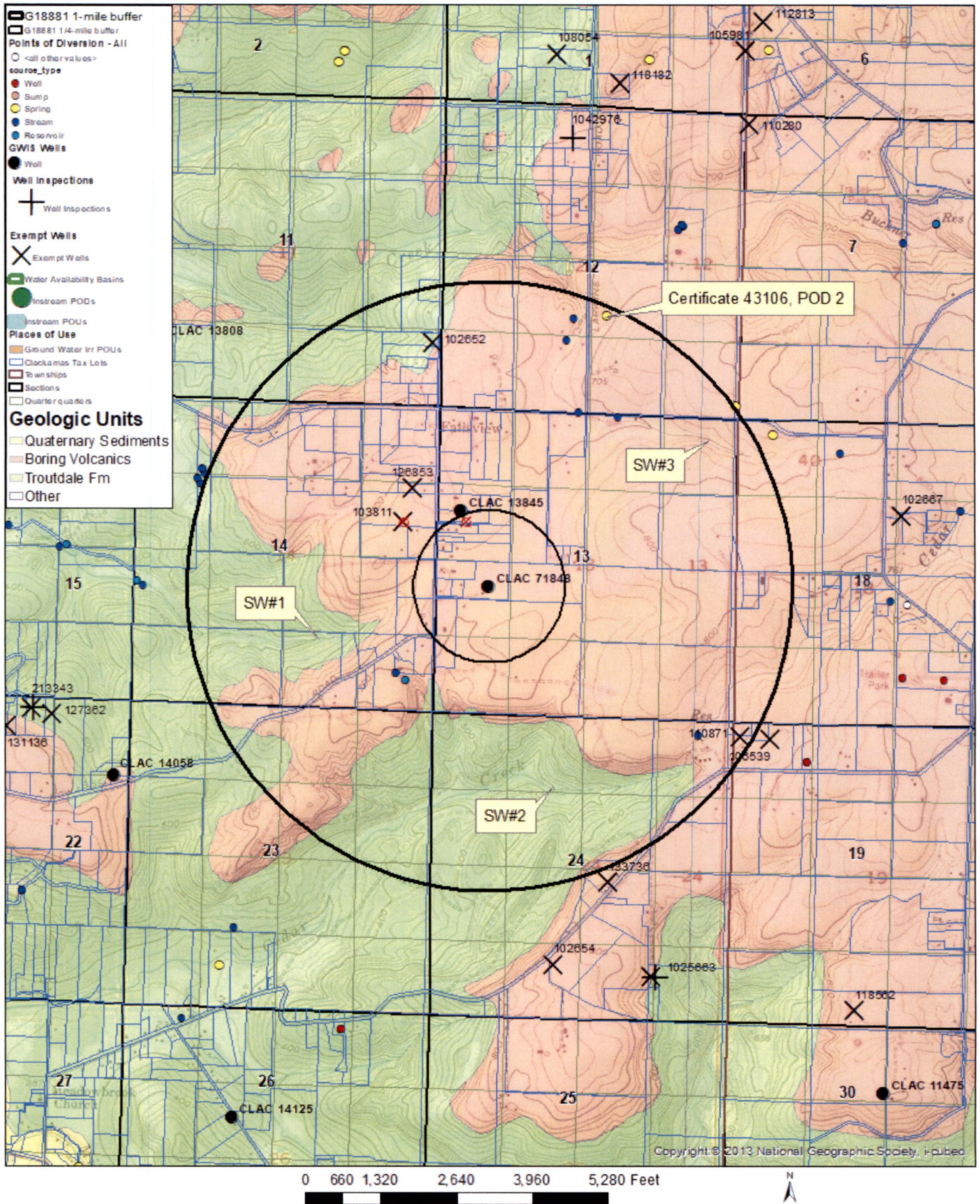
Watershed ID #: 131
 Time: 3:30 PM
 MILK CR > MOLALLA R - AT MOUTH
 Basin: WILLAMETTE
 Exceedance Level: 80
 Date: 01/07/2020

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	124.00	2.41	122.00	0.00	85.00	36.60
FEB	117.00	2.29	115.00	0.00	85.00	29.70
MAR	121.00	2.00	119.00	0.00	85.00	34.00
APR	91.50	2.24	89.30	0.00	85.00	4.26
MAY	59.20	5.04	54.20	0.00	85.00	-30.80
JUN	26.50	7.50	19.00	0.00	60.00	-41.00
JUL	10.80	12.70	-1.93	0.00	40.00	-41.90
AUG	8.92	10.50	-1.55	0.00	20.00	-21.60
SEP	8.95	4.65	4.30	0.00	20.00	-15.70
OCT	15.20	1.69	13.50	0.00	40.00	-26.50
NOV	32.20	1.55	30.70	0.00	85.00	-54.30
DEC	92.00	2.52	89.50	0.00	85.00	4.48
ANN	93,600	3,340	90,300	0	46,700	48,700

Well Statistics (Sections 13 & 14, 4S/2E)



Well Location Map



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MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager
From: Joel Jeffery, Well Construction Program Coordinator
Subject: Review of Water Right Application G-18881
Date: February 12, 2020

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

Applicant's Well # 1 (CLAC 71848): 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.

503-656-2683

(1) OWNER: Well Number: **02**
 Name **Stephen G Savage**
 Address **16762 S Howards Mill Rd**
 City **Beavercreek** State **OR** Zip **97004**

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

(3) DRILL METHOD:
 Rotary Air Rotary Mud 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 **161** ft.
 Explosives used Yes No Type Amount

HOLE			SEAL			Amount
Diameter	From	To	Material	From	To	sacks or pounds
12	0	28	Bentonite	28	0	22 Sacks
8	28	95	Calculated			12 Sacks
6	95	161	Cem w/5% ben	95	16	6 Sacks
			Calculated			8 Sacks

How was seal placed: Method A B C D E
 Other **Poured bentonite; Pumped cement at 95'**
 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: 8	+2	28	.250	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	+1.5	95	.250	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Liner: 4	84	161	Sch40	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Drive Shoe used Inside Outside None
 Final location of shoe(s) _____

(7) PERFORATIONS/SCREENS:

Perforations Method **Saw**
 Screens Type _____ Material _____

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
147	160	1/8x3	50			<input type="checkbox"/>	<input checked="" type="checkbox"/>

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

Yield gal/min	Drawdown	Drill stem at	Time
30		160	1.5 hrs.

TDS Amount **23 ppm**

Temperature of Water **52.7°** Depth Artesian Flow found _____
 Was a water analysis done? Yes By whom **SDI, 0.5ppm Iron**
 Did any strata contain water not suitable for intended use? Too little
 Salty Muddy Odor Colored Other **Surface 6' - 17'**
 Depth of strata: **58' - 63'**

(9) LOCATION OF WELL by legal description:
 County **Clackamas** Latitude _____ Longitude _____
 Township **4SOUTH** N or S. Range **2EAST** E or W. of WM.
 Section **13** NW 1/4 SW 1/4
 Tax lot **01200** Lot _____ Block _____ Subdivision _____
 Street Address of Well (or nearest address) **16812 S Howards Mill Rd, Beavercreek, OR**

(10) STATIC WATER LEVEL:
96 ft. below land surface. Date **11/25/2015**
 Artesian pressure _____ lb. per square inch. Date _____

(11) WATER BEARING ZONES:
 Depth at which water was first found **6'**

From	To	Estimated Flow Rate	SWL
6	17	15	5
58	63	1.5	N/A
96	155	30	96

(12) WELL LOG:

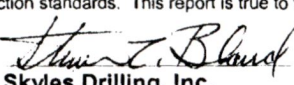
Material	From	To	SWL
Top soil, brown	0	0.5	
Lava, gray & brown broken	0.5	2	
Clay, brown gritty	2	6	
Lava, multicolored weathered	6	8	
Lava, gray w/white specks fractured	8	10	
Lava, multicolored soft	10	15	
Lava, gray & brown w/white specks fractured	15	17	
Lava, light gray	17	22	
Lava, gray	22	27	
Basalt, gray	27	32	
Lava, gray w/brown @times	32	41	
Lava, multicolored porous	41	51	
Lava, gray fractured	51	63	
Basalt, gray	63	86	
Basalt, gray & brown fractured	86	96	
Basalt, gray & brown porous	96	114	96
Basalt, brown porous	114	145	96
Basalt, gray & brown fracture & porous	145	155	96
Basalt, gray & brown	155	161	

SKYLES DRILLING, INC.
503-656-2683
 Date started **11/19/2015** Completed **11/25/2015**

(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.

Signed  WWC Number **1715**
 Date **11/30/2015**
Skyles Drilling, Inc.

(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.

Signed  WWC Number **1592**
 Date **11/30/2015**
Skyles Drilling, Inc.