Groundwater Application Review Summary Form

Application # G- 18733

GW Reviewer M. Thoma **Date Review Completed:** 05/29/19

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.
For POA#2 only

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.
✓ JS 6/4/19

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 05/29, 2019

TO: **Application** G- 18733

FROM: **GW:** M. Thoma
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

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

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

☐ 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-18733

Date: June 24, 2019

The attached application was forwarded to the Well Construction and Compliance Section by Water Rights. Mike Thoma reviewed the application. Please see Mike's Groundwater Review and the Well Logs.

Applicant's Well #1 (LANE 17834): 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). The depth of the annular seal is not adequate. In order to meet minimum well construction standards, the well must be continuously cased and continuously sealed with an approved grout to a minimum depth of 23 feet below ground surface.

My recommendation is that the Department **not issue a permit** for Applicant's Well #1 (LANE 17834) 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.

Bringing Applicant's Well #1 into compliance with minimum well construction standards may not satisfy hydraulic connection issues.

Applicant's Well #2 (LANE 57466): Based on a review of the Well Report, Applicant's Well #2 appears to protect the groundwater resource.

The construction of Applicants Well #2 may not satisfy hydraulic connection issues.

RECEIVED

SEP 2 4 1999

WATER RESOURCES DEPT.
SALEM, OREGON

LANE 57466

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 36130
START CARD # 124057

(1) OWNER: Well Number 1786
Name Richard VanDehay
Address 28292 Cantrell Rd.
City Eugene State OR Zip 97402

(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 110 ft.
Explosives used ☐ Yes ☒ No Type ____ Amount ____

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
10"	0'	19'	Bentonite	0'	19'	8 Sacks
6"	19'	110'				

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☒ Other Placed @ 1 sack per 5 min rate
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'	19'	.250	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:	None				☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s) None

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

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
None						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
40 Gpm		110'	1 hr.

Temperature of water 57° 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 Lane Latitude ____ Longitude ____
Township 18S N or S Range 05W E or W. WM.
Section 01 NE 1/4 NE 1/4
Tax Lot 103 Lot ____ Block ____ Subdivision ____
Street Address of Well (or nearest address) Same

(10) STATIC WATER LEVEL:
31' ft. below land surface. Date 9-13-99
Artesian pressure ____ lb. per square inch. Date ____

(11) WATER BEARING ZONES:
Depth at which water was first found 88'

From	To	Estimated Flow Rate	SWL
88'	89'	40 GPM	31'

(12) WELL LOG:
Ground Elevation ____

Material	From	To	SWL
Topsoil	0	2	
Brown CLAY	2	9	
Weathered Sandstone	9	12	
Gray Sandstone	12	92	31'
Red Cinders (Red)	92	110	31'

Date started 9-13-99 Completed 9-13-99

(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 1411
Signed [signature] 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 751
Signed Donald J Loving Date 9-17-99

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

WATER WELL REPORT
STATE OF OREGON

LANE
17834

RECEIVED
APR 5 1983
WATER RESOURCES DEPT
SALEM, OREGON

State Well No. 18s/5w-1aa

State Permit No.

(1) OWNER:
Name Dick Vandehey
Address 90570 Nadeau Rd.
City Springfield State Oregon

(2) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary Air ☐ Driven ☐
Mud ☐ Dug ☐
☒ Bored ☐

(4) PROPOSED USE (check):
Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐
Thermal: Withdrawal ☐ Reinjection ☐

(5) CASING INSTALLED:
Steel ☒ Plastic ☒
Threaded ☐ Welded ☐
10" hole 26'
8" hole 100'
6" Diam. from 0 ft. to 26 ft. Gauge .250
6" Diam. from 26 ft. to 100 ft. Gauge .160

LINER INSTALLED:
" Diam. from ft. to ft. Gauge

(6) PERFORATIONS:
Perforated? ☒ Yes ☐ No
Type of perforator used torch
Size of perforations 1/8 in by 1 1/2 in.
60 perforations from 80 ft. to 100 ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☒ Yes ☐ No
Manufacturer's Name simpson
Type plastic Model No. 160PSI
Diam. 6 Slot Size 1/8 Set from 80 ft. to 100 ft.
Diam. Slot Size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
A pump test made? ☒ Yes ☐ No If yes, by whom? driller
30 gal./min. with 43 ft. drawdown after 4½ hrs.
" " " "
Air test gal./min. with drill stem at ft. hrs.
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Special standards: Yes ☐ No ☐
Well seal—Material used cement
Well sealed from land surface to 18 ft.
Diameter of well bore to bottom of seal 10 in.
Diameter of well bore below seal 6 in.
Number of sacks of cement used in well seal 6 sacks
How was cement grout placed? pressure grout
Was pump installed? Type HP Depth ft.
Was a drive shoe used? ☐ Yes ☒ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☒ No
Type of Water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Lane Driller's well number
NE ¼ NE ¼ Section 1 T. 18S R. 5W W.M.
Tax Lot # Lot Blk Subdivision
Address at well location: Cantrell Rd.

(11) WATER LEVEL: Completed well.
Depth at which water was first found 72 ft.
Static level 12 ft. below land surface. Date 3-14-83
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing
Depth drilled 100 ft. Depth of completed well 100 ft.
Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Top Soil	0	1	
Consolidated clay/ fine gravel	1	18	12
Soft gray shale/blue & gray	18	24	
Soft blue/gray shale & clay	24	42	
Soft clay/blue/gray shale	42	47	
Blue/gray shale & clay	47	78	
Blue/gray shale & clay	78	100	

Work started 3-14 19 83 Completed 3-18 19 83
Date well drilling machine moved off of well 3-18 19 83

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Mike Gordon Date 4/2, 19 83
(Drilling Machine Operator)
Drilling Machine Operator's License No. 917

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Mike's Well Drilling
(Person, firm or corporation) (Type or print)
Address 84851 Prodan, Lane Pleasant Hill, Ore. 97401
[Signed] Mike Gordon
(Water Well Contractor)
Contractor's License No. 620 Date 4-2, 19 83

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

SP*12658-690

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 05/28/2019

FROM: Groundwater Section Michael Thoma
Reviewer's Name

SUBJECT: Application G- 18733 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: **Apex BioSciencse** County: **Lane**

A1. Applicant(s) seek(s) 0.655 cfs from 2 well(s) in the Willamette Basin, Long Tom subbasin

A2. Proposed use Irrigation (52.4 acres) Seasonality: Mar 1 – Oct 31

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	LANE 17834	1	Bedrock	0.655	18S/05W-01 NENE	70'S, 530'W of NE cor S 01
2	LANE 57466	2	Bedrock	0.655	18S/05W-01 NENE	1490'S, 570'W of NE cor S 01
3						

* 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	430	72	12	3/14/83	100	0-18	0-26	26-100	80-100	30		
2	430	88	31	9/13/99	110	0-19	+1-19	-	-	40		A

Use data from application for proposed wells.

A4. **Comments:** _____

A5. ☐ **Provisions of the** Willamette (OAR 690-502) 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) **7C (7-yr SWL); 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:** There is limited water level data in the area so groundwater over-appropriation cannot be determine and SWL condition is recommended. The nearest permitted groundwater POA is nearly 1 mile to the north of the proposed POAs and groundwater injury is unlikely but Medium Water-Use Reporting is recommended to ascertain that the proposed use is within the capacity of the 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	**Fractured Bedrock of Fisher Fm.**	☒	☐
2	**Fractured Bedrock of Fisher Fm.**	☒	☐
		☐	☐

Basis for aquifer confinement evaluation: Reported 'SWL' is above 'First Water' on many of the well logs for the area.

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	**Coyote Creek**	**360**	**370-375**	**5676**	☒	☐	☐	☐	☒
2	1	**Coyote Creek**	**340**	**370-375**	**4908**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Groundwater elevations are near surface water elevations implying that groundwater is flowing between surface water and the adjacent aquifer system.

Water Availability Basin the well(s) are located within: Long Tom R > Willamette R – AB Mouth (ID# 114)

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?
2	1	☐	☐	**None**	**NA**	☐	**32.10**	☒	**<< 10%**	☒
		☐	☐			☐		☐		☐

Comments: Stream depletion was estimated using the Hunt (2003) stream-depletion model and hydraulic parameter values in the range of what is expected for the geology of the area. However, given the limited amount of information on aquifer and model parameters (including transmissivity and thickness of alluvial sediments), more-precise estimates of stream-depletion are not reasonable but, assuming that the thickness of alluvial sediments beneath Coyote Creek is greater than 10 ft, stream-depletion is very likely to be less than 10% at 30 days as well as at the end of the irrigation season (244 days).

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:

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**	**< 10%**	**< 10%**	**< 10%**	**< 10%**	**< 10%**	**< 10%**	**< 10%**	**< 10%**	**< 10%**	**< 10%**	**< 10%**	**< 10%**
Well Q as CFS		**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**	**0.66**
Interference CFS		**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**
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.		**< 0.07**	**< 0.07**	**< 0.07**	**< 0.07**	**< 0.07**	**< 0.07**	**< 0.07**	**< 0.07**	**< 0.07**	**< 0.07**	**< 0.07**	**< 0.07**
(B) = 80 % Nat. Q		**568**	**697**	**596**	**373**	**215**	**105**	**50.6**	**35.4**	**32.1**	**35.3**	**82.5**	**364**
(C) = 1 % Nat. Q		**5.68**	**6.97**	**5.96**	**3.73**	**2.15**	**1.05**	**0.51**	**0.35**	**0.32**	**0.35**	**0.83**	**3.64**
(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: See comments on C3a for estimates of stream depletion

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 POAs would be producing from an aquifer that has been found to be hydraulically connected to surface water – specifically Coyote Creek at a distance of around 1 mile. **POA #2** is within 1 mile of Coyote Creek and the proposed maximum rate of appropriation is greater than 1% of the pertinent adopted perennial streamflow. Per OAR 690-009-0040(4), POA #2 is assumed to have the Potential for Substantial Interference. If the proposed rate were reduced to < 0.32 cfs (144 gpm) the automatic assumption of PSI would not be required.

POA #1 is greater than 1 mile from Coyote Creek and the estimated stream-depletion is less than 1% of the 80%-exceedance flows for the surrounding WAB so POA #1 is not assumed to have the Potential for Substantial Interference.

References Used:

Herrera, N. B., Burns, E. R., and T. D. Conlon. 2014. *Simulation of Groundwater Flow and the Interaction of Groundwater and Surface Water in the Willamette Basin and Central Willamette Subbasin*, Oregon. USGS Scientific Investigations Report 2014-5136.

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

McClaughry, J. D., T. J. Wiley, M. L. Ferns, and I. P Madin. 2010. *Digital Geologic Map of the Southern Willamette Valley, Benton, Lane, Linn, Marion, and Polk Counties, Oregon.* Oregon Dept. of Geology and Mineral Industries. Open File Report O-10-13.

OWRD Well Log Database – Accessed 05/28/2019

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

Water Availability Analysis
Detailed Reports

LONG TOM R > WILLAMETTE R - AB MOUTH
WILLAMETTE BASIN

Water Availability as of 5/29/2019

Watershed ID #: 114 (Map)
Date: 5/29/2019

Exceedance Level: 80%
Time: 8:46 AM

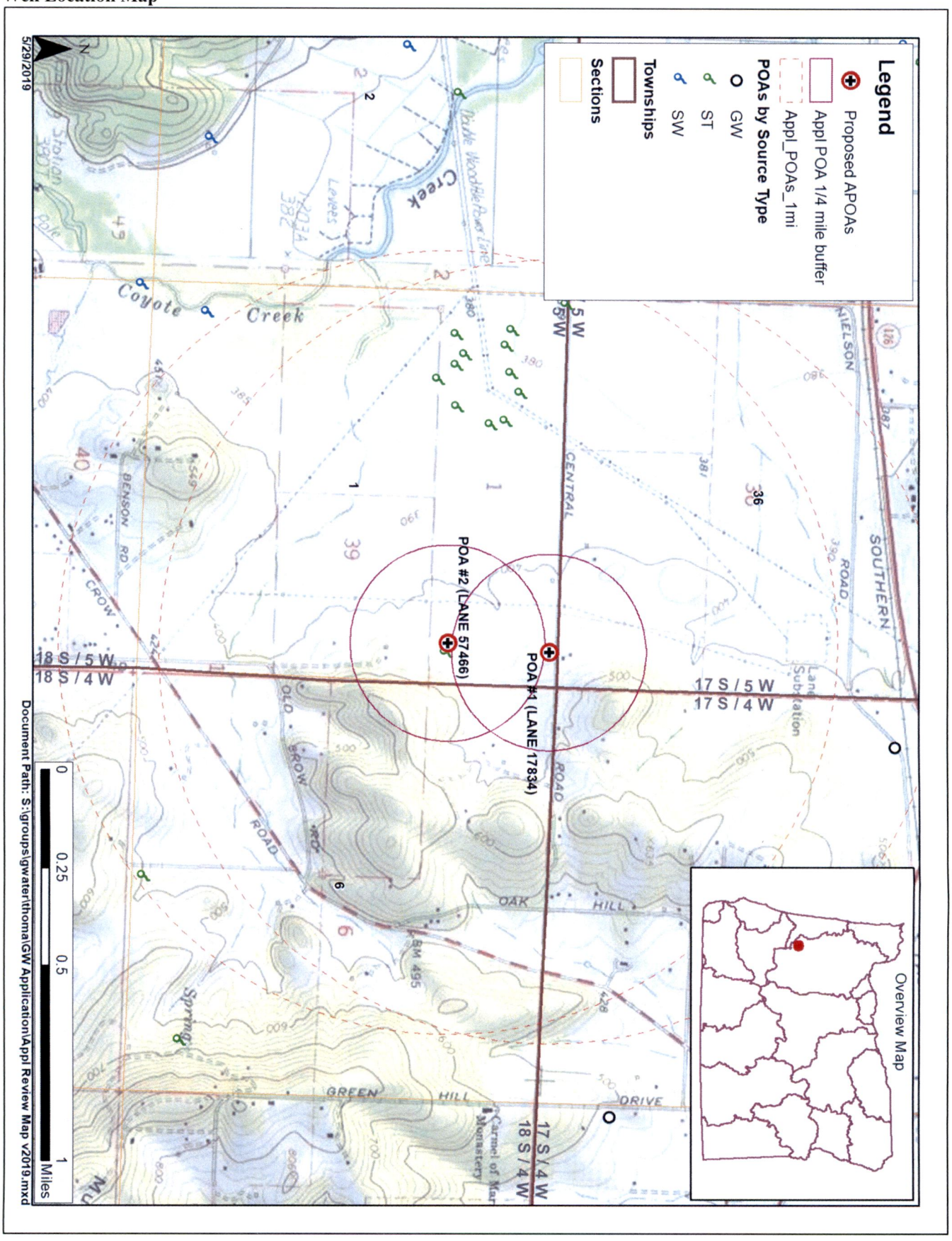
Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations | Water Rights | Watershed Characteristics

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	568.00	149.00	419.00	0.00	0.00	419.00
FEB	697.00	389.00	308.00	0.00	0.00	308.00
MAR	596.00	556.00	40.40	0.00	0.00	40.40
APR	373.00	250.00	123.00	0.00	0.00	123.00
MAY	215.00	64.40	151.00	0.00	0.00	151.00
JUN	105.00	30.10	74.90	0.00	0.00	74.90
JUL	50.60	48.40	2.23	0.00	0.00	2.23
AUG	35.40	39.30	-3.95	0.00	0.00	-3.95
SEP	32.10	22.00	10.10	0.00	0.00	10.10
OCT	35.30	6.28	29.00	0.00	0.00	29.00
NOV	82.50	6.02	76.50	0.00	0.00	76.50
DEC	364.00	106.00	258.00	0.00	0.00	258.00
ANN	362,000.00	99,700.00	262,000.00	0.00	0.00	262,000.00

Well Location Map



Stream-Depletion Model Results
(Scenario 3 values predict maximum probable stream-depletion)

PyHunt stream depletion analysis tool

Application type:	G
Application number:	18733
Well number:	1
Stream Number:	1
Pumping rate (cfs):	0.66
Pumping duration (days):	244.0
Pumping start month number (3=March)	3.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	4910	4910	4910	ft
Aquifer transmissivity	T	600	600	2000	ft2/day
Aquifer storativity	S	0.005	0.001	0.0001	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.001	0.005	ft/day
Aquitard saturated thickness	ba	15	15	15	ft
Aquitard thickness below stream	babs	10	10	10	ft
Aquitard specific yield	Sya	0.1	0.1	0.001	-
Stream width	ws	50	50	50	ft

Stream depletion for Scenario 2:

Days	10	330	360	30	60	90	120	150	180	210	240	270	300
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