WATER RESOURCES DEPARTMENT

MEMO June 22, 2016

TO: **Application G-** 18218

FROM: **GW:** Aurora Bouchier
(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

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date **June 22, 2016**

FROM: Groundwater Section **Aurora C Bouchier**
Reviewer's Name

SUBJECT: Application G- **18218** Supersedes review of **na**
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: **Clyde & Helen Kersting** County: **Clackamas**

A1. Applicant(s) seek(s) **0.04** cfs from **1** well(s) in the **Willamette** Basin, **Clackamas** subbasin

A2. Proposed use **nursery (3.0 acres)** 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	PROPOSED	1	Alluvium	0.04	3S/3E-5 SE-SE	361' N, 124' W fo SE cor S 5
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	545		Est 150-200		Est 320							

Use data from application for proposed wells.

A4. **Comments:** The well is proposed. The well will be constructed to develop water from water-bearing zones within the Troutdale Formation. The application has a note saying they anticipate encountering water at ~230 feet in elevation based on well logs in the area. It is likely the driller meant 230 feet below land surface.

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 will be constructed in a confined aquifer, so the pertinent basin rules do not apply (OAR 690-502-0240).

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**;
   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:**

The area in the vicinity of the proposed wells is underlain by basalt flows of the Boring Lavas and sediments of the Troutdale Formation and the Sandy River Mudstone (Trimble, 1963). In the area of the applicant's proposed wells, basalt flows of the Boring Lavas occur at land surface (Trimble, 1963). The basalt flows are generally up to 200 feet thick in the area, except in areas near the eruption vents, where the basalts extend to much greater depths. A few wells in the area report Boring Lavas to depths of about 200-250 feet (see logs for CLAC 16549 and CLAC 70588). Beneath the Boring lava lies several hundred feet of older alluvium, which is generally fine-grained mudstone containing beds of sand and gravel. The Columbia River Basalts underlie the older sediments in the area, although the exact depth is uncertain. There are no known wells in the area that have encountered Columbia River Basalts, but the top of the basalts are estimated to be around 900-1000 feet below land surface in the area (Gannett and Caldwell, 1998).

Yields reported on well logs for wells completed similarly to the applicant's proposed well generally range up to 30 gpm, with one nearby well log reporting 90 gpm with a drawdown of 376 feet (see log CLAC 66506).

No local data is available to evaluate water-level trends over time in this area. This indicates a need for some water-level monitoring to assess the on-going health of the ground-water system.

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	**Troutdale**	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The well log for nearby wells, CLAC 16549 and CLAC 70588, indicate the presence of thin, confined beds encased in a thick sequence of silts and clays (the Troutdale Formation of Madin, 2004). This suggests that the productive water-bearing zones are likely to be confined.

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**	**Unnamed Trib to Clear Creek (south of applicant)**	**345-395**	**350**	**850**	☒	☐	☐	☐	☒
1	**2**	**Unnamed Trib to Clear Creek (east of applicant)**	**345-395**	**395**	**4395**	☒	☐	☐	☐	☒
1	**3**	**Clear Creek**	**345-395**	**270**	**3470**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: The groundwater elevation range is based on heads from two nearby wells (CLAC 16549 and CLAC 70588) which are completed similarly to the applicant's proposed well. Because the nearby wells are close to the applicant's proposed well and are completed to similar depths, the heads are likely a reasonable estimate for the head in the applicant's proposed well. Based on the well logs for ~84 wells completed in Sections 5 and 8, it appears there is a decreasing head with depth. The perennial nature of Clear Creek and its tributaries indicate a component of groundwater discharge that sustains surface water flows. The static water level in nearby wells, CLAC 16549 and CLAC 70588, suggest that the groundwater in the applicant's well is likely to be above the elevation of the nearby streams.

Water Availability Basin the well(s) are located within: 82: Clear Cr > Clackamas R – at mouth

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**	☒	☐	**NA**		☐	**5.65**	☐	**See below**	☒
1	**2**	☐	☐	**NA**		☐	**5.65**	☐	**See below**	☐
1	**3**	☐	☐	**NA**		☐	**5.65**	☐	**See below**	☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: Due to uncertainties regarding the distribution and occurrence of productive water-bearing zones, a model was not used to estimate the interference at 30 days.

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:

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:

Application file: G-18218, and nearby G-16761, G-16978.

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.

Madin, I.P., 2004, Geologic Mapping & Database for Portland area fault studies: Final report, Clackamas, Multnomah & Washington Counties, OR, Open File Report O-04-02, Oregon Department of Geology and Mineral Industries, Portland, OR., map scale 1:24,000

McFarland, William D., and Morgan, David S., 1996, Description of the Groundwater Flow System in the Portland Basin, Oregon and Washington: U.S. Geological Survey Water-Supply Paper 2470-A, 58p, 7 plates.

Swanson, R.D., McFarland, W.D., Gonthier, J.B., and Wilkinson, J.M, 1993, A Description of Hydrogeologic Units in the Portland Basin, Oregon and Washington: U.S. Geological Survey Water-Resources Investigations Report 90-4196, 56 p., 10 sheets, scale 1:100,000.

Trimble, Donald E., 1963, Geology of Portland, Oregon and Adjacent Areas, Geological Survey Bulletin 1119, 119 p., 1 pl.

OWRD Groundwater Database and well logs.

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

CLEAR CR > CLACKAMAS R - AT MOUTH

Watershed ID #: 82 Basin: WILLAMETTE Exceedance Level: 80
Time: 1:32 PM Date: 06/22/2016

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	126.00	1.29	125.00	0.00	0.00	125.00
FEB	128.00	1.19	127.00	0.00	0.00	127.00
MAR	128.00	0.79	127.00	0.00	0.00	127.00
APR	131.00	0.93	130.00	0.00	0.00	130.00
MAY	111.00	2.64	108.00	0.00	0.00	108.00
JUN	48.10	3.69	44.40	0.00	40.00	4.41
JUL	19.00	6.40	12.60	0.00	40.00	-27.40
AUG	8.02	5.22	2.80	0.00	20.00	-17.20
SEP	5.65	2.22	3.43	0.00	20.00	-16.60
OCT	6.23	0.86	5.37	0.00	0.00	5.37
NOV	21.50	0.85	20.60	0.00	0.00	20.60
DEC	103.00	1.36	102.00	0.00	0.00	102.00
ANN	99,100	1,670	97,400	0	7,260	93,300

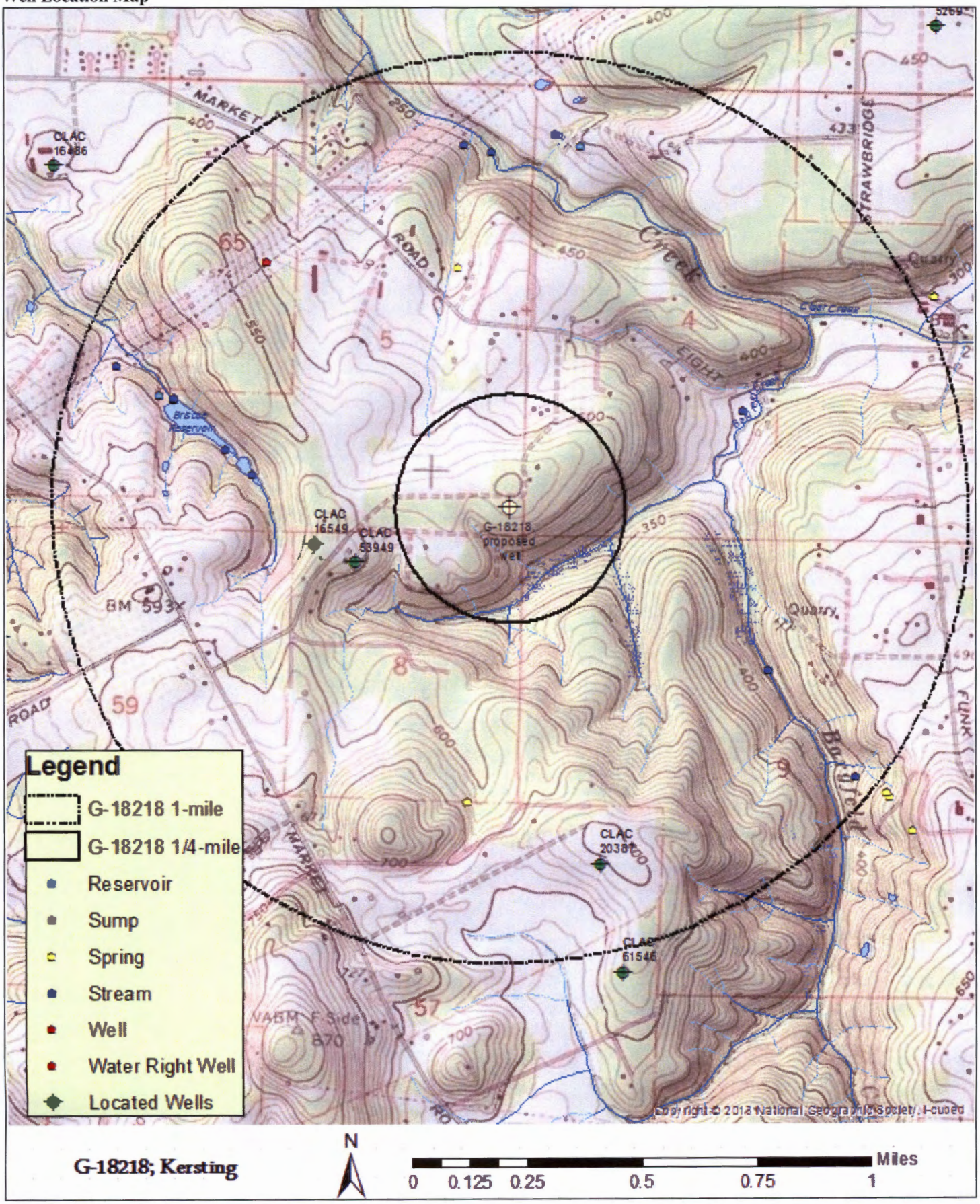
DETAILED REPORT OF INSTREAM REQUIREMENTS

CLEAR CR > CLACKAMAS R - AT MOUTH

Watershed ID #: 82 Basin: WILLAMETTE
Time: 1:32 PM Date: 06/22/2016

Application Number	Status	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		Monthly values are in cfs.											
MF82A	CERTIFICATE	0.0	0.0	0.0	0.0	0.0	40.0	40.0	20.0	20.0	0.0	0.00	0.0
MAXIMUM		0.0	0.0	0.0	0.0	0.0	40.0	40.0	20.0	20.0	0.0	0.0	0.0

Well Location Map



G-18218; Kersting

Version: 04/20/2015