

Groundwater Application Review Summary Form

Application # G-LL-1753

GW Reviewer DENNIS ORLOWSKI

Date Review Completed: 6/29/2018

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.

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 6/29/2018
 FROM: Groundwater Section _____ Dennis Orłowski _____
 Reviewer's Name
 SUBJECT: Application LL- 1753 _____ 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: William Tenbusch County: Linn

A1. Applicant(s) seek(s) 0.5 cfs from one well(s) in the Willamette Basin,
Calapooia River subbasin

A2. Proposed use Irrigation (estab. hazlenuts) Seasonality: Mar 1 – Oct 31 (through 2022)

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	LINN 61779	1	Alluvium	0.5	T14S, R2W-4 SW-SE	105'N, 2140' E fr SE cor S4

* 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	385	95	20	8/22/2016	200	0-19	+1-119		90-112	60	Unk	Air

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU location is along the eastern edge of the southern Willamette Valley approximately three miles east-southeast of Brownsville, Oregon.

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: Proposed Well 1 is not within ¼ mile of a perennial stream reach and the well will produce from a confined aquifer. Thus the pertinent 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: Not applicable.

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 (annual measurements), 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 _____ 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, LINN 61779, is located in the relatively-narrow Calapooia River alluvial valley, bordered by bedrock uplands north of the Calapooia and south of Courtney Creek. The area in the vicinity of the well is underlain by about 200 feet of sediments which overlie low-permeability bedrock. Most of the sedimentary deposits are fine-grained, but logs for LINN 61779 and other area wells indicate that some thin (i.e., <10 ft) sand and gravel water-bearing beds occur within the otherwise low-permeability deposits. The main water-bearing zone in the proposed POA is a sand and gravel bed from 95 to 107 ft bgs (Gannett and Caldwell, 1998; Conlon and others, 2005; Frank and Johnson, 1975).

Groundwater level data is extremely sparse for the immediate area. However, data from several alluvial aquifer wells located several miles due west show generally stable trends. Only a few permitted irrigation wells are located in the area, and the OWRD well log database indicates that domestic well density is relatively low. Therefore, it is unlikely that groundwater is over-appropriated in this area. However, the noted permit conditions are recommended to provide much needed information for this area.

NOTE: the application requests a maximum instantaneous allocation of 0.5 cfs, or ~224 gpm. The well log for LINN 61779 shows an air-lift yield of only 60 gpm, or ~0.13 cfs; other area wells report yields ranging from 1-75 gpm, with most around 10-30 gpm. Therefore, it is highly unlikely that the applicant will be able to obtain the full requested instantaneous allocation from a single well.

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	Alluvium	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: The static water level in well 1 (LINN 61779) is far above the first reported water-bearing zone at 95-107 ft bls, a sand and gravel deposit overlain by primarily low-permeability silts and clays. This indicates confined conditions in the alluvial aquifer tapped by Well 1.

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	Calapooia River	370	360-380	3050	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: The estimated groundwater elevation is nearly coincident with the estimated elevation range for SW 1 within approximately one mile. Also, the USGS water table map for this area shows groundwater in the alluvial aquifer system flowing towards the Calapooia River (gaining reach) (Gannett and Caldwell, 1998). These facts indicate that the alluvial aquifer system is hydraulically connected to SW1.

The depletion of local streams by the proposed well will be attenuated, but not eliminated, by the low vertical hydraulic conductivity (permeability) of silts and clays that lie between the deeper sands and gravels and the stream beds. Net impacts will be relatively small at the onset of pumping, but will increase with time until a new equilibrium between local recharge and discharge is reached. After that time stream depletion is expected to be relatively constant throughout the year.

Water Availability Basin the well(s) are located within: WID 76: Calapooia River > Willamette River – above 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	<input type="checkbox"/>	<input type="checkbox"/>	MF76A	20.00	<input checked="" type="checkbox"/>	22.70	<input checked="" type="checkbox"/>	<<25%	<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: C3a: previous analytical stream depletion modeling for similar hydrogeologic settings indicate that stream depletion at 30 days is expected to be much less than 25% due largely to relatively-thick sequence of low-permeability sediments present between the stream and the deeper aquifer water-bearing zones.

C3b: not applicable.

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: Not applicable.

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:** PSI is assumed because the maximum requested instantaneous allocation, 0.5 cfs (~224 gpm), exceeds 1% of both the minimum ISWR and 80% exceedance flows in SW1.

If the applicant were to reduce the requested maximum instantaneous rate to 0.20 cfs (~90 gpm) or less, then PSI would not be found. This would be prudent for the applicant, because as discussed previously in Section B3 of this review, it appears as though the applicant's well, LINN 61779, and other similarly-constructed wells are capable of producing maximum yields on the order of only ~10-60 gpm (~0.02-0.13 cfs), much less than this requested allocation.

References Used: Application file LL-1753

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.

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

Frank, J.F. and Johnson, N.A., 1975, Ground-water data in the Harrisburg-Halsey area, central Willamette Valley, Oregon: State of Oregon, Ground Water Report No. 22.

D. WELL CONSTRUCTION, OAR 690-200

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

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

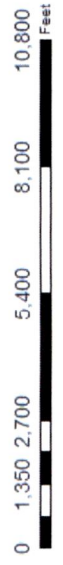
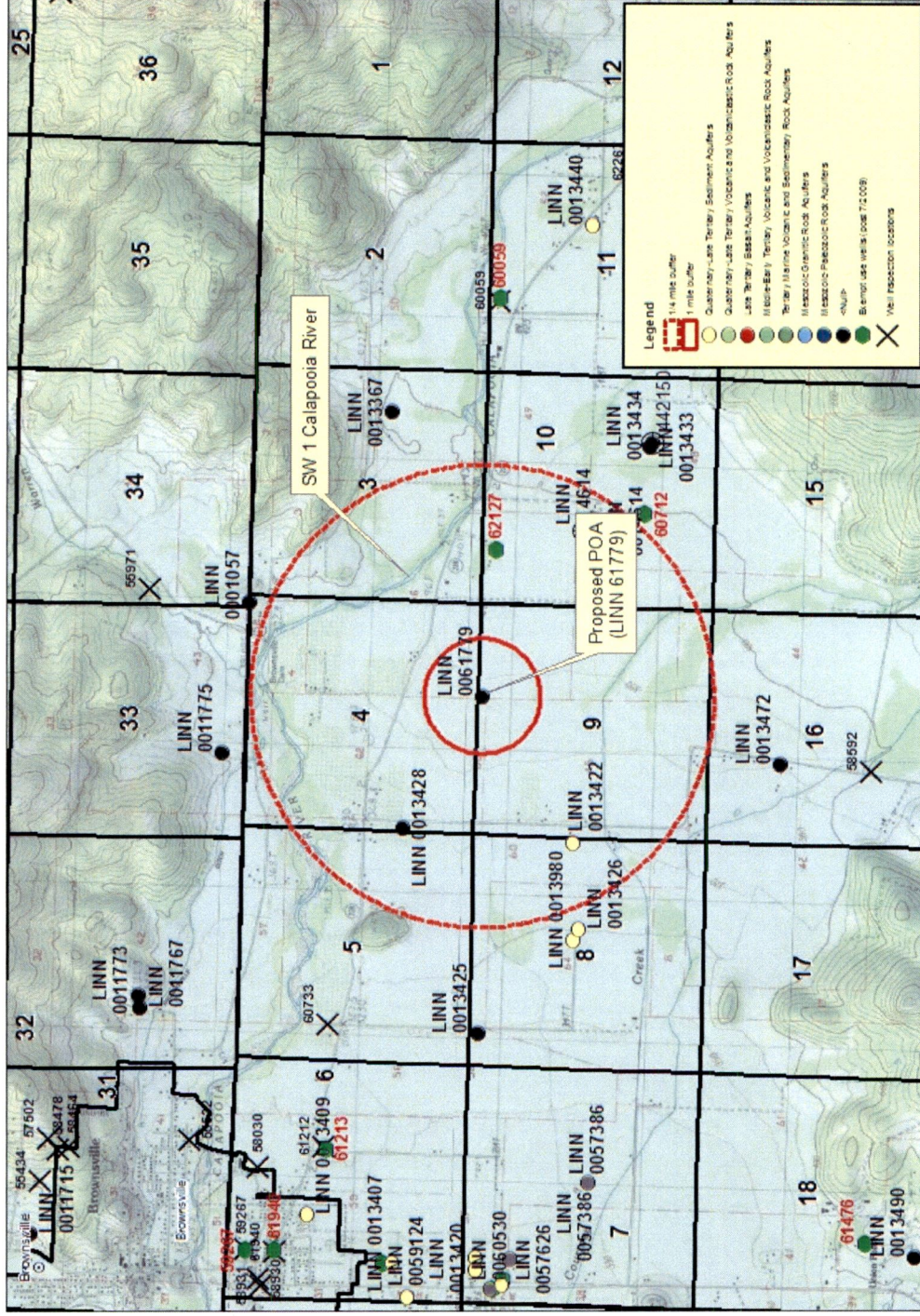
- a. review of the well log;
- b. field inspection by _____ ;
- c. report of CWRE _____ ;
- d. other: (specify) _____

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.**

Well Location Map

LL-1753 Tenbusch
T14S, R2W, Section 4



Water Availability Table



Water Availability Analysis Detailed Reports

CALAPOOIA R > WILLAMETTE R - AB MOUTH
WILLAMETTE BASIN

Water Availability as of 6/28/2018

Watershed ID #: 76 (Map)

Date: 6/28/2018

Exceedance Level: 80%
Time: 2:13 PM

Water Availability Calculation

Water Rights

Consumptive Uses and Storages

Instream Flow Requirements

Watershed Characteristics

Reservations

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	592.00	3.40	589.00	0.00	20.00	569.00
FEB	650.00	3.35	647.00	0.00	20.00	627.00
MAR	575.00	2.27	573.00	0.00	20.00	553.00
APR	423.00	1.98	421.00	0.00	20.00	401.00
MAY	234.00	18.30	216.00	0.00	20.00	196.00
JUN	111.00	12.80	98.20	0.00	20.00	78.20
JUL	49.00	19.60	29.40	0.00	20.00	9.42
AUG	26.00	14.10	11.90	0.00	20.00	-8.09
SEP	22.70	7.36	15.30	0.00	20.00	-4.66
OCT	29.60	1.92	27.70	0.00	20.00	7.68
NOV	133.00	2.41	131.00	0.00	20.00	111.00
DEC	495.00	3.36	496.00	0.00	20.00	476.00
ANN	404,000.00	5,520.00	398,000.00	0.00	14,500.00	384,000.00

Water-Level Trends in Nearby Wells

