

Groundwater Application Review Summary Form

Application # LL-1777

GW Reviewer J. Woody, B. Scandella Date Review Completed: 9-11-2019

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.

at 9/16/19

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).

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 9/11/2019
 FROM: Groundwater Section Benjamin Scandella, Jen Woody
Reviewer's Name
 SUBJECT: Application LL-1777 Supersedes review of 5/9/2019
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: JOHN BURNHAM County: POLK

- A1. Applicant(s) seek(s) 0.045 cfs from 1 well(s) in the Willamette Basin,
Middle Willamette subbasin
- A2. Proposed use: IRRIGATION TO ESTABLISH GRAPES (12 Acres). Seasonality: JANUARY 1 THROUGH DECEMBER 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
2	POLK 52073	2	CRBG	0.045	6S/4W-13 NE-SE	220' S, 1215' W fr E cor S 13

* 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
2	630	190	163	11/4/2004	220	0-120	+2-120	10-220	160-220	20		Air (1 hr)

Use data from application for proposed wells.

- A4. **Comments:** The proposed POA is located on the margins of Spring Valley, about 2.5 miles NW of Lincoln. This review considers a modification of the original application, eliminating Well #1 (POLK 52191) and using only Well #2 (POLK 52073), reducing the rate from 0.0914 cfs to 0.045 cfs, reducing the irrigated area from 19 acres to 12 acres, and reducing the total annual volume from 19 AF to 1.44 AF. Pumping at the maximum rate would use the total annual volume within about 16 days.
- 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: Both wells produce groundwater from a confined aquifer, and thus the pertinent rules (OAR 690-502-0240) do not apply.
- A6. **Well(s) #** POLK 52073, tap(s) an aquifer limited by an administrative restriction.
 Name of administrative area: Eola Hills Ground Water Limited Area (690-502-0200)
 Comments: "Groundwater in the basalt aquifers in the Eola Hills Groundwater Limited Area is classified for exempt uses, irrigation and rural residential fire protection systems only. Permits may be issued, for a period not to exceed five years, for fire protection and for drip or equally efficient irrigation provided the Director finds the proposed use and amount do not pose a threat to the groundwater resource or existing permit holders" (OAR 690-502-0200).
This proposed limited license application appears to be consistent with the provisions of OAR 690-502-0200.

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) 7i (Willamette CRBG conditions); 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 _____ a single aquifer in the Columbia River Basalt Group 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, POLK 52703, is located the southeastern foothills of the Eola Hills, which are comprised of Columbia River Basalt Group (CRBG) flows overlying older marine sedimentary rocks. In this area the Miocene CRBG overlies Eocene marine sedimentary rocks. Extensive surficial contacts between the CRBG and marine sedimentary rocks are mapped near the wells' location, which implies that the CRBG pinches out at those locations (Woodward and others, 1998; Conlon and others, 2005; Gannett and others, 1998). However, closer review of area well logs (e.g., POLK 52787, POLK 1232, and POLK 50276) suggests that the areal extent and thickness of the CRBG at and near the subject wells are somewhat greater than indicated on regional USGS geologic maps (Conlon and others, 2005). On this basis, it is concluded that the water-bearing "weathered rock brown with hard seams" from 151-220 ft bgs on the POLK 52073 well log is accessing aquifers in the CRBG and not the underlying marine sedimentary rock units.

Groundwater data for the CRBG in this area is sparse, with wells completed in the CRBG showing low to moderate yields from ~5-50 gpm. The two nearby long-term datasets for wells potentially accessing the same CRBG aquifer (POLK 323 and POLK 1225) show relatively stable levels, with a decline from 1986 to 2006 followed by recovery through 2018. The 1-mile distance and 20-30 ft head separation between POLK 1225 and the applicant's wells makes it difficult to establish whether they access the same aquifer within the CRBG and conclude whether groundwater will be available within the capacity of the resource.

There is a spring with multiple associated rights (Certificates 43863 and 93133) located approximately 970 ft from the subject well and at an elevation consistent with their water levels. Analytic modeling using the Theis (1941) drawdown model with relevant parameters (Conlon and others, 2005, OWRD Groundwater Database, 2019) suggests that pumping at the proposed rate for 16 days would likely cause over 2 ft of drawdown at the spring (see figures below). Furthermore, the stream that originates at this spring is mapped as intermittent (USGS, 2018; dashed line on map below), suggesting that any reduction in water pressure in the aquifer would decrease the duration of spring flow each year. The facts that the certificates include year-round use and have a sum rate of 0.04 cfs suggest that the spring's flow may be slow and that reductions in its flow rate or season of activity could be problematic.

Analytic modeling assuming a likely use scenario of an average rate of 2.3 gmp over 70 days suggests that drawdown would likely be limited to less than 0.5 ft, which may still allow the spring to supply sufficient water to the certificated rights.

Therefore, the proposed use is unlikely to interfere with the spring and cause a senior user not to receive their entitled water. However, given the strong potential for injury to the certificated spring under the proposed rate, and the unknown sensitivity of the spring to drawdown, the Limited License should be conditioned as follows:

Special Condition: POLK 52073 shall be shut off if either Certificate 43863 or Certificate 93133 does not receive the water to which it is legally entitled. The well shall remain shut off until the following spring, unless it is specifically re-authorized by The Director.

Other permitted spring rights exist within ~2,000 ft of the subject well (Certificates 30528, 31628, 60891, and 60892) and may also be injured by the proposed use. In case a Limited License is issued, the conditions noted in B1(d) are required by the Willamette Basin rules for CRBG wells and will enable monitoring for use above 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
2	CRBG	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: Water-bearing zones within the CRBG typically display high degrees of confinement. The well log for POLK 52073 shows the water level 27' above the top of the water-bearing zone, indicating confined conditions.

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
2	1	King Creek	465	360-730	1500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	2	Unnamed trib. To King Creek	465	400-520	5600	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: SW elevation ranges encompass elevations within 1 mile of the well. Both SW #1 and SW #2 incise through the CRBG in the vicinity of the subject well, and the coincidence of head values with SW elevations supports a finding of hydraulic connection.

Water Availability Basin the well(s) are located within: WID 182: Willamette R > Columbia R – above Molalla River

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	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	3830	<input type="checkbox"/>	*	<input type="checkbox"/>
2	2	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	3830	<input type="checkbox"/>	*	<input 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 note: *There is no appropriate model to estimate streamflow depletion from pumping in CRBG interflow zones that are incised by streams or discharge to point sources such as springs. Therefore, the percentage of interference at 30 days was not calculated.

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.

Basis for impact evaluation: N/A

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 LL-1777 file

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.

Oregon Water Resources Department Groundwater Database.

U.S. Geological Survey. National Hydrography Dataset. Reston, VA: U.S. Dept. of the Interior, U.S. Geological Survey, 2018.

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.**

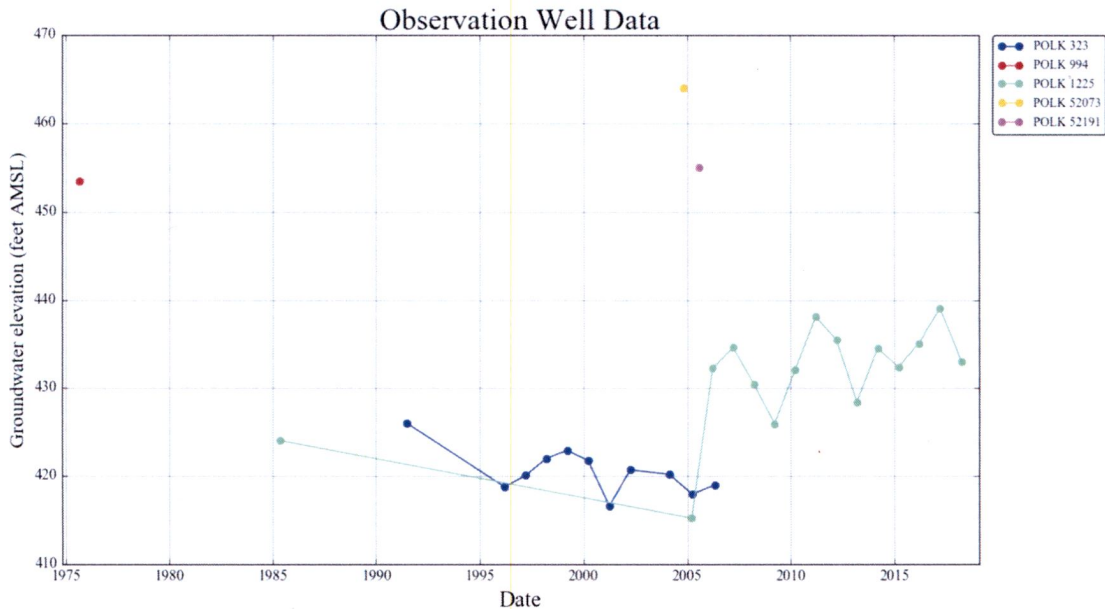
Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

Watershed ID #: 182
 Time: 11:51 AM
 WILLAMETTE R > COLUMBIA R - AB MOLALLA R
 Basin: WILLAMETTE
 Exceedance Level: 80
 Date: 04/12/2019

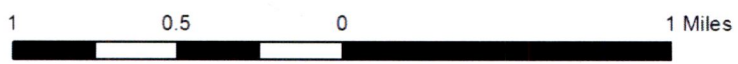
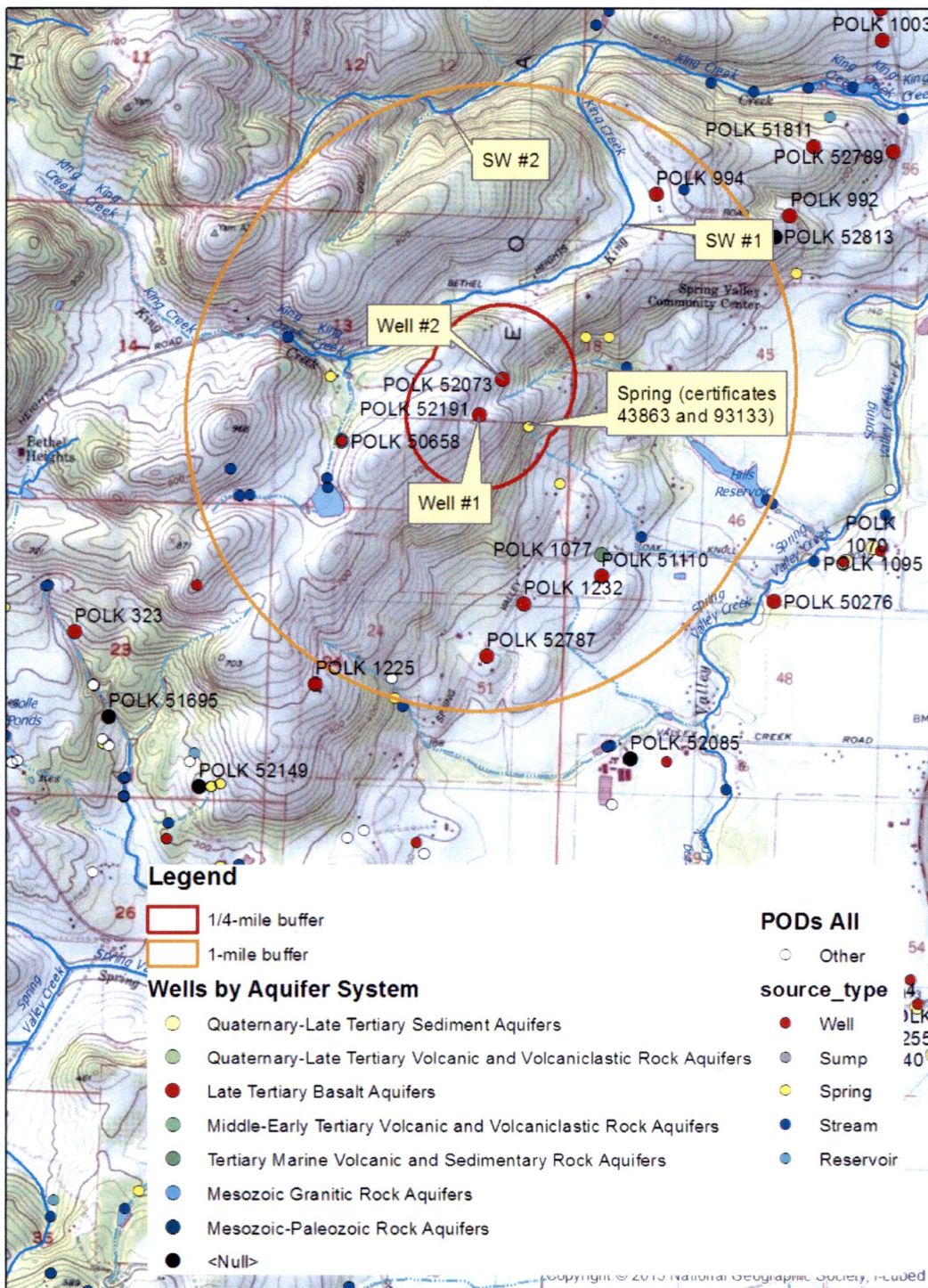
Month	Natural Stream Flow	Consumptive use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net water Available
Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.						
JAN	21,400.00	2,290.00	19,100.00	0.00	1,500.00	17,600.00
FEB	23,200.00	7,470.00	15,700.00	0.00	1,500.00	14,200.00
MAR	22,400.00	7,250.00	15,200.00	0.00	1,500.00	13,700.00
APR	19,900.00	6,900.00	13,000.00	0.00	1,500.00	11,500.00
MAY	16,600.00	4,240.00	12,400.00	0.00	1,500.00	10,900.00
JUN	8,740.00	1,980.00	6,760.00	0.00	1,500.00	5,260.00
JUL	4,980.00	1,810.00	3,170.00	0.00	1,500.00	1,670.00
AUG	3,830.00	1,650.00	2,180.00	0.00	1,500.00	681.00
SEP	3,890.00	1,390.00	2,500.00	0.00	1,500.00	996.00
OCT	4,850.00	747.00	4,100.00	0.00	1,500.00	2,600.00
NOV	10,200.00	879.00	9,320.00	0.00	1,500.00	7,820.00
DEC	19,300.00	961.00	18,300.00	0.00	1,500.00	16,800.00
ANN	15,200,000	2,250,000	13,000,000	0	1,090,000	11,900,000

Water-level measurements in nearby wells that access the Columbia River Basalt Group:



Well Location Map

LL-1777 (Burnham): 6S/4W-13



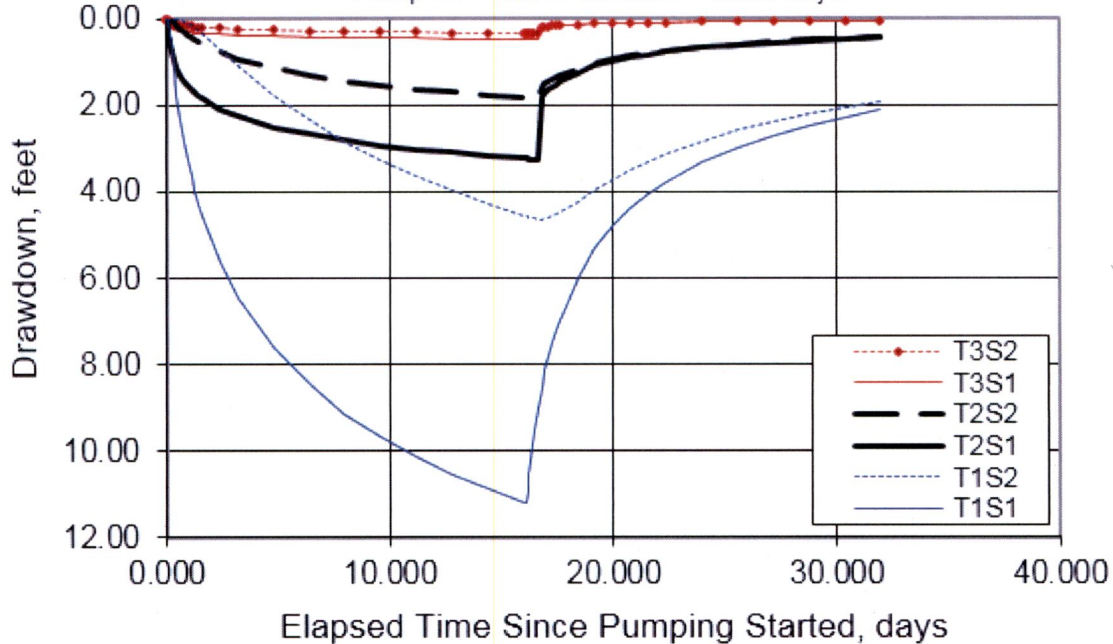
Model parameters and results

(Pumping in POLK 52073 using the maximum rate until the total annual volume is reached in the revised Limited License Application and drawdown observed at the spring on Certificates 43863 and 93133)

Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units	
Total pumping time	t		16		d	
Radial distance from pumped well:	r		970.00		ft	Q conversions
Pumping rate	Q		20.0		gpm	20.00 gpm
Hydraulic conductivity	K	2	10	100	ft/day	0.04 cfs
Aquifer thickness	b		50		ft	2.67 cfm
Storativity	S_1		0.00010			3,850.27 cfd
	S_2		0.00100			0.09 af/d
Transmissivity Conversions	T_f2pd	100	500	5,000	ft ² /day	
	T_ft2pm	0.0694	0.3472	3.4722	ft ² /min	
	T_gpdft	748	3,740	37,400	gpd/ft	

This Drawdown and Recovery at r = 970 ft From Pumping Well

Pump on = 23040 minutes = 16.00 days

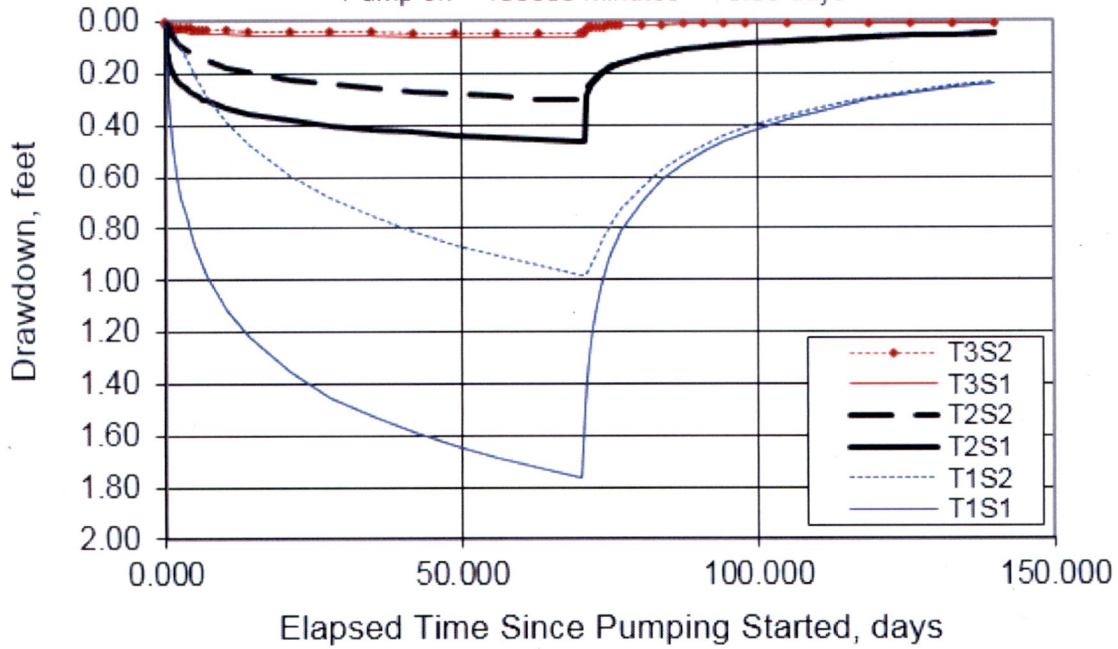


Model parameters and results

(Pumping in POLK 52073 assuming likely average long-term pumping rates and drawdown observed at the spring on Certificates 43863 and 93133)

Input Data:	Var Name	Scenario 1	Scenario 2	Scenario 3	Units	
Total pumping time	t		70		d	
Radial distance from pumped well:	r		970.00		ft	Q conversions
Pumping rate	Q		2.3		gpm	2.25 gpm
Hydraulic conductivity	K	2	10	100	ft/day	0.01 cfs
Aquifer thickness	b		50		ft	0.30 cfm
Storativity	S_1		0.00010			433.16 cfd
	S_2		0.00100			0.01 af/d
Transmissivity Conversions	T_f2pd	100	500	5,000	ft ² /day	
	T_ft2pm	0.0694	0.3472	3.4722	ft ² /min	
	T_gpdpft	748	3,740	37,400	gpd/ft	

This Drawdown and Recovery at r = 970 ft From Pumping Well
 Pump on = 100800 minutes = 70.00 days



Memo to Groundwater

App.: LL-1777
From: Mary Bjork
Date: 08/19/2019
Subject: Request 2nd Groundwater Review

Please see 8/9/2019 request from applicant's agent Bill Flatz, for a second groundwater review of LL-1777. The area of irrigation, rate, duty and number of wells have been reduced in hopes of a favorable groundwater review.

BJORK Mary F * WRD

From: Bill Flatz <billflatz@stuntzner.com>
Sent: Friday, August 09, 2019 11:46 AM
To: BJORK Mary F * WRD
Cc: John Burnham
Subject: Revised Limited License area, rate and duty. John Burnham LL-1117
Attachments: Submittal letter to OWRD, Burnham LL Revised App. 8-9-19.pdf; Burnham Limited License Applic Map 8-9-19.pdf

Mary:

Please find attached a submittal letter that summarizes the revised area, rate and duty. We also ask only for Well #2 for the source. I thought it would help to have that specified in writing.

Also attached is the revised map that reflects the changes.

We will keep our fingers crossed. Please let us know if any decision is made or if you need any additional information.

Thank you for your help with this project.

Sincerely,

Bill Flatz - PE, CWRE, CESCL



Office: 503-357-5717

Fax: 503-357-5698

Cell: 503-939-8381

2318-B Pacific Avenue

Forest Grove, Or. 97116



TELEPHONE (503) 357-5717
CELL (503) 939-8381
FAX (503) 357-5698
billflatz@stuntzner.com

2318-B Pacific Avenue
FOREST GROVE, OREGON 97116

COOS BAY - FOREST GROVE - DALLAS - JUNCTION CITY

TO: Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

SUBJECT: Revised Limited License: area, rate and duty, LL-1117, on behalf of John Burnham.

August 9th, 2019

To whom it may concern:

In our discussions with the owner, John Burnham, he believes that he needs from 15 to 30 gallons per vine per season to get his grapes established. In order to reduce the potential for interference with any other water rights, we will change our requested water use from the limited area standard down to the water needed to establish the grapes he will be planting. A summary of our revisions is provided below.

- The requested area of irrigation has been reduced from 19 down to 12 acres.
- The requested rate has been reduced from 0.150 down to 0.045 cubic feet per second.
- The requested duty has been reduced from 19 down to 1.44 acre-feet.

We have also dropped the use of Well #1, the domestic well from our request. The requested POA will be only from Well #2. This should avoid any concerns about the construction of Well #1.

This will allow John to irrigate up to 31 gallons per vine per season. Please keep in mind that it is likely that John's actual water use will be less than 1.0 acre-feet per season.

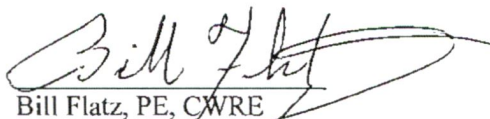
We have also discussed with the owner that all permits specify that if a senior right is effected by the water use OWRD may require reduced use or stopping use of the water. Mr. Burnham understands this and will conserve water to every extent possible.

Please find enclosed:

- One Revised Limited License Ground Water Application Map.

Please call if you have any questions or need any further information.

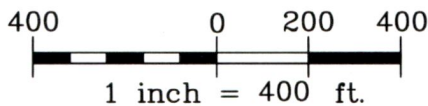
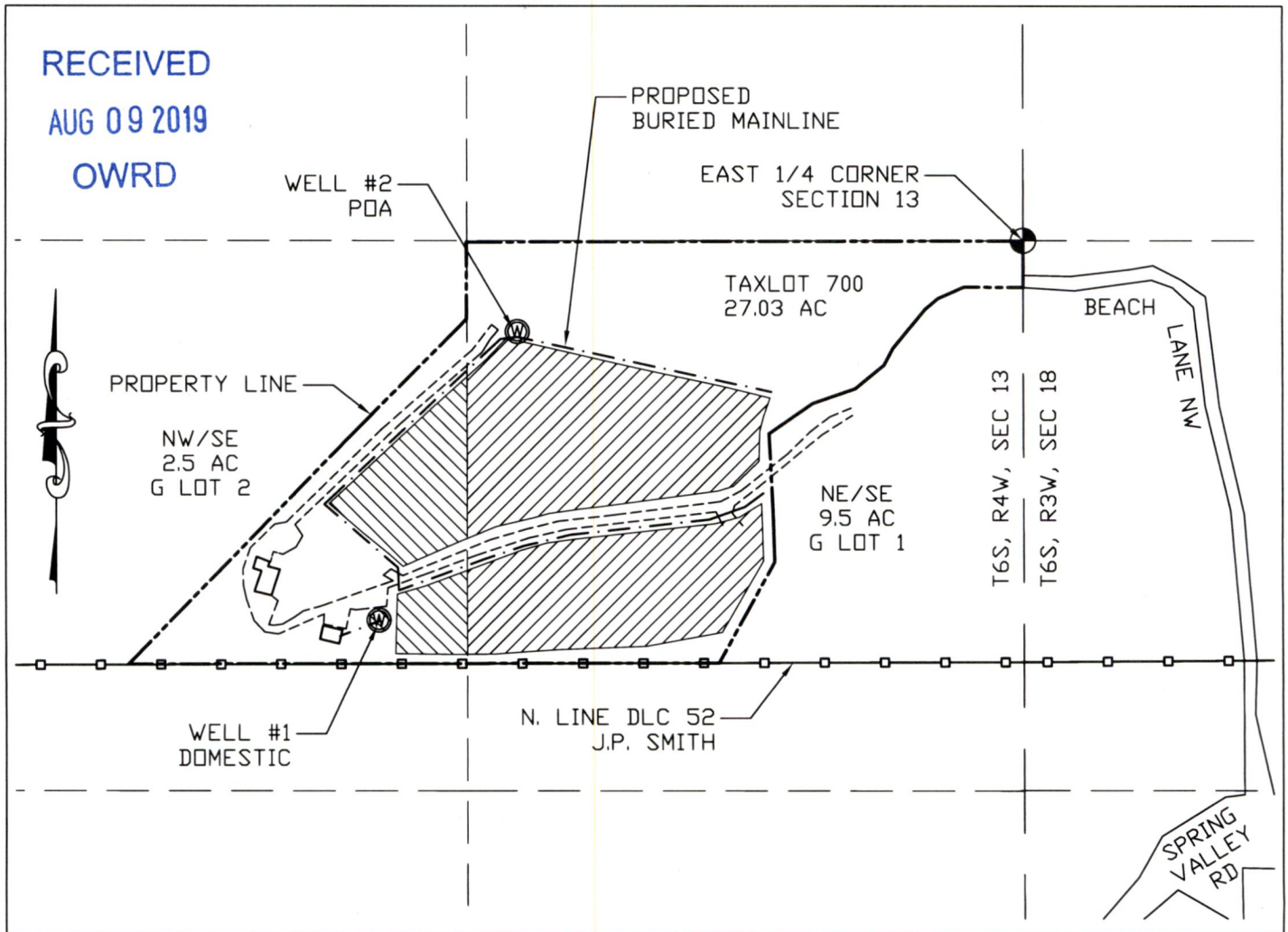
Sincerely,
Stuntzner Engineering & Forestry, LLC


Bill Flatz, PE, CWRE

RECEIVED
AUG 09 2019
OWRD

LIMITED LICENSE APPLICATION MAP, REVISED 8-8-19
T6S, R4W, SECTION 13, TAX LOT 700

RECEIVED
 AUG 09 2019
 OWRD



Q-Q	Acres
NW/SE	2.5
NE/SE	9.5
Total =	12.0

MAP PRODUCED FOR:
 JOHN BURNHAM
 4110 BEACH LANE N.W.
 SALEM, OR 97304

WELL #1, DOMESTIC, LOCATED
 1,550' W AND 910' S FROM THE E.
 1/4 CORN. SEC. 13, POLK 52191

WELL #2, POA, IRRIGATION,
 LOCATED 1,215' W AND 220' S
 FROM THE E. 1/4 CORN. SEC. 13,
 POLK 52073

	Original Max	Revised Max	Revised Request	Units
Area =	19.0	12.0	12.0	ac
Rate =	0.238	0.150	0.045	cfs
Rate =	107	67	20	gpm
Duty depth =	1.00	1.00	0.12	ft
Duty Vol. =	19.00	12.00	1.44	ac-ft

NOTE: THIS MAP IS PRODUCED TO INDICATE
 THE LOCATION OF A WATER RIGHT. IT IS NOT
 INTENDED TO PROVIDE INFORMATION RELATIVE
 TO THE LOCATION OF PROPERTY LINES.



MAP BASIS: TAX MAP 6.4.13 WASHINGTON COUNTY,
 GOOGLE AIR PHOTO, ON SITE INSPECTION.
 SEF JOB #318-056 REV. DATE: 8-9-19
 DWG NAME: BURNHAM LL APP MAP



EXPIRES 12/31/2019