

MEMO

September 7, 2016

FROM: GW: Aurora Bouchier
(Reviewer's Name)

☐ YES☒ NO☐ YES☒ NO

☐ 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.**

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.

[illegible]

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date September 14, 2016

FROM: Groundwater Section Aurora C Bouchier
Reviewer's Name

SUBJECT: Application G- 18313/G-18341 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: Imagine It LLC/ Lisa Friberg County: Yamhill

A1. Applicant(s) seek(s) 0.21 cfs from 4 well(s) in the Willamette Basin,
Yamhill subbasin

A2. Proposed use Nursery (35.8 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	YAMH 635	West Home Well	Basalt	0.05	T5S/R5W-19 NE-NW	1970' N, 675' W fr Center S 19
2	YAMH 699	East Home Well	Bedrock	0.05	T5S/R5W-19 NE-NW	1915' N, 175' W fr Center S 19
3	YAMH 50648	Verde Well	Bedrock	0.05	T5S/R5W-19 NW-NE	1480' N, 285' E fr Center S 19
4	YAMH 7338	Blanca Well	Basalt	0.05	T5S/R5W-19 NE-NW	2100' N, 545' W fr Center S 19

* 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	538	198	110	4/9/1986	245	0-24	+2-24	0-245	205-245	11		Air
2	558	112	48	4/1/1991	302	0-22	+1-22	0-302	188-208, 282-302	10		Air
3	561	189	103	5/10/1997	260	0-36	+2-36	0-260	180-200, 240-260	9		Air
4	558	182	59	6/23/1982	202	0-19	0-19	--	--	25		Air

Use data from application for proposed wells.

A4. **Comments:** The applicant (Imagine It LLC/Lisa Friberg) has submitted 2 applications for water rights on adjacent properties in the Deer Creek drainage (tributary to the South Yamhill River). Application G-18313 includes three wells (wells 1 and 2 are located in tax lot 1100 and well 3 is located in tax lot 1200) and is requesting a total rate of 0.16 cubic feet per second (cfs) for nursery use on 20 acres. Application G-18314 allocated the production between the wells such that the individual well rates are 0.05 cfs. Application G-18314 includes one well (YAMH 7338 is located in tax lot 400) with a requested rate of 0.05 cfs for nursery use on 15.8 acres.

The Groundwater Section recognizes the applicant's intent to obtain separate water rights. However, the Groundwater Section determined that the cumulative impacts to the nearest hydraulically connected stream warranted that the two applications be reviewed concurrently.

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 wells are producing from a confined source, so 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: _____

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, Medium Water Use Reporting Condition;
 - 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): NA

- B3. **Groundwater availability remarks:** The applicant proposes a per well rate of 0.05 cfs (approximately 22 gpm) from 4 wells completed in the low-yield Tertiary Marine Volcanic and Sedimentary Rock aquifer, specifically the Nestucca Formation (Yeats et al., 1996). There are no permitted groundwater rights within one mile of the proposed POAs. The Tertiary marine and sedimentary rocks are generally fine-grained, well cemented, and have well yields that range from 2-10 gpm (Gannett and Caldwell, 1998), which is consistent with the yields reported on the well logs (YAMH 699 and YAMH 50648: 10 and 9 gpm respectively – based on air tests which tend to over-estimate the well yield). Likewise, wells completed in the volcanic or intrusive rocks of the Coast Range tend to have low yields (YAMH 635 and YAMH 7338: 11 and 25 gpm respectively, also based on an air test) as these rock units commonly contain secondary minerals which reduce the fracture permeability (Gannett and Caldwell, 1998). This formation is considered part of the basement confining unit (Woodward et al., 1998). In general, wells completed in this unit are only able to provide sufficient water for domestic uses (Conlon et al, 2005). This unit is known to be fractured, however the orientation, exact location, density, and connectivity of the fractures are largely unknown and highly variable. There are 34 well logs on file for 33 domestic wells within Section 19, indicating moderate groundwater development for exempt uses. The median reported yield of these 34 well logs is 5.5-6 gpm, which suggests that the requested per well rate is likely more than this aquifer will produce.

Well-to-well interference is unpredictable in fractured rock aquifers because fractures are not continuous or consistently connected, so there is uncertainty regarding the potential for interference with nearby groundwater users. There are no nearby, long-term static water level data available in the subject aquifer. Therefore, the groundwater resource cannot be determined to be over-appropriated. The proximity to neighboring wells raises the potential for interference with senior groundwater users, but pumping drawdown effects in a low-yield, fractured aquifer are not expected to be widespread. Annual water level and water use monitoring and reporting is recommended to address the potential impact to senior users.

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	Basalt (within Tertiary volcanic bedrock)	☒	☐
2	Tertiary Marine bedrock*	☒	☐
3	Tertiary Marine bedrock	☒	☐
4	Basalt (within Tertiary volcanic bedrock)	☒	☐

Basis for aquifer confinement evaluation: The well log for wells list a water level above the water-bearing zone, indicating confined conditions.

* Well 2 (YAMH 699) is open to 'coarse grained gray basalt' which was encountered from 10 to 97 feet bls and was sealed into - however the basalt does not appear to be water-bearing.

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	Dupee Creek	~430	195-222	2785	☒	☐	☐	☐	☒
2	1		~510	195-222	3258	☒	☐	☐	☐	☒
3	1		~460	195-222	3750	☒	☐	☐	☐	☒
4	1		~500	195-222	2945	☒	☐	☐	☐	☒
1	2	Deer Creek	~430	195-200	4200	☒	☐	☐	☐	☒
2	2		~510	195-200	4655	☒	☐	☐	☐	☒
3	2		~460	195-200	4982	☒	☐	☐	☐	☒
4	2		~500	195-200	4370	☒	☐	☐	☐	☒
1	3	Unnamed Trib to Deer Ck east of applicant's wells	~430	196-325	2360	☒	☐	☐	☐	☒
2	3		~510	196-325	1965	☒	☐	☐	☐	☒
3	3		~460	196-325	1880	☒	☐	☐	☐	☒
4	3		~500	196-325	2190	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: Based on the static water level listed on the well logs, the groundwater is higher in elevation than the elevation of the local streams. It is likely that the groundwater is contributing to surface water.

Water Availability Basin the well(s) are located within: 91: Deer Cr > S Yamhill 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	na	☐	5.25	☐	See below	☐
2	1	☐	☐	na	na	☐	5.25	☐	See below	☐
3	1	☐	☐	na	na	☐	5.25	☐	See below	☐
4	1	☐	☐	na	na	☐	5.25	☐	See below	☐
1	2	☐	☐	na	na	☐	5.25	☐	See below	☐
2	2	☐	☐	na	na	☐	5.25	☐	See below	☐

3	2	☐	☐	na	na	☐	5.25	☐	See below	☐
4	2	☐	☐	na	na	☐	5.25	☐	See below	☐
1	3	☐	☐	na	na	☐	5.25	☐	See below	☐
2	3	☐	☐	na	na	☐	5.25	☐	See below	☐
3	3	☐	☐	na	na	☐	5.25	☐	See below	☐
4	3	☐	☐	na	na	☐	5.25	☐	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?
	1		☐	na	na	☐	5.25	☒	See below	☒
	2		☐	na	na	☐	5.25	☒	See below	☒
	3		☐	na	na	☐	5.25	☒	See below	☒

Comments: Interference at 30 days could not be estimated because the terrain (high-relief slopes) and geology (fractured bedrock aquifer) do not meet model assumptions of the widely accepted technique for determining stream depletion (i.e. Hunt 1999, 2003). Therefore, no estimate of stream interference as 30 days was included in table C3a or C3b.

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													

(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:
- ☐ The permit should contain condition #(s) _____;
 - ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:** Under OAR 690-009 the proposed use does produce the finding of potential for substantial interference with nearby surface water.

References Used:

Application file: G-18313.

Conlon, Terrence D., Wozniak, Karl C., Woodcock, Douglas, Herrera, Nora B., Fisher, Bruce J., Morgan, David S., Lee, Karl K., and Hinkle, Stephen R., 2005, Ground-Water Hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

Gannett, Marshall W., and Caldwell, Rodney R., 1998, Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A.

Woodward, Dennis G., Gannett, Marshall W., and Vaccaro, John J., 1998, Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington; U.S. Geological Survey Professional Paper 1424-B.

Yeats, R.S., Werner, K.S., Popowski, T.A., 1996, Geologic map of the northern Willamette Valley, Clackamas, Marion, Multnomah, Polk, Tillamook, Washington and Yamhill counties, Oregon: U.S. Geological Survey, Reston, VA., Professional Paper PP-1560, map

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:** _____

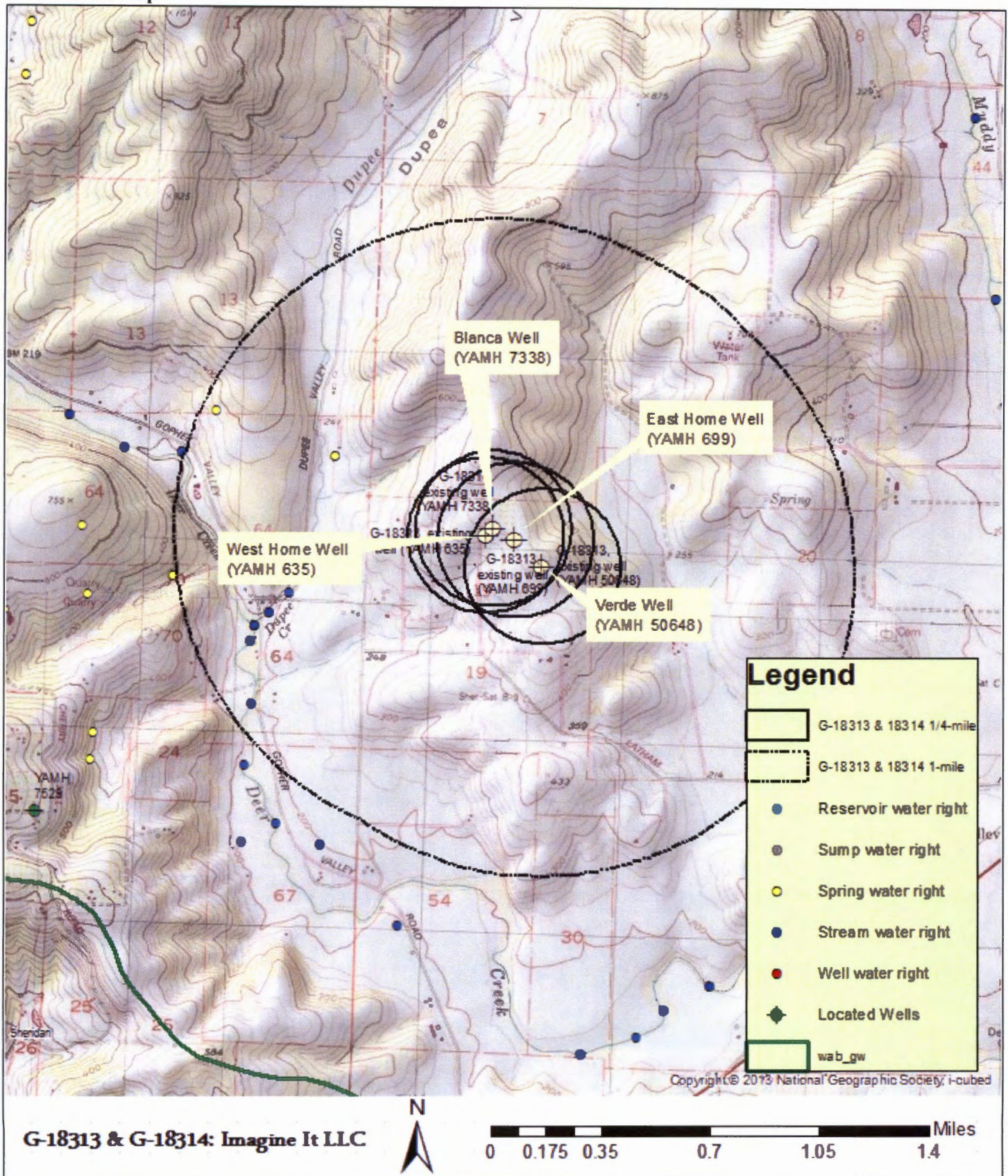
 _____D4. ☐ Route to the Well Construction and Compliance Section for a review of existing well construction.**Water Availability Tables**

WATER AVAILABILITY TABLE																	
Watershed ID #:		91		DEER CR > S YAMHILL R - AT MOUTH										Exceedance Level: 80			
Time: 10:23 AM		Basin: WILLAMETTE														Date: 09/07/2016	
# watershed																	
Nest ID Number		Stream Name		JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC STOR													
1	181	WILLAMETTE R > COLUMBIA R - AT MOUTH		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES		
2	182	WILLAMETTE R > COLUMBIA R - AB MOLALLA R		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES		
3	30200801	YAMHILL R > WILLAMETTE R - AT MOUTH		YES	YES	YES	YES	YES	YES	NO	NO	NO	YES	YES	YES		
4	188	YAMHILL R > WILLAMETTE R - AB PALMER CR		YES	YES	YES	YES	YES	YES	NO	NO	NO	YES	YES	YES		
5	163	S YAMHILL R > YAMHILL R - AT MOUTH		YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	YES	YES		
6	162	S YAMHILL R > YAMHILL R - AB COZINE CR		YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	YES	YES		
7	91	DEER CR > S YAMHILL R - AT MOUTH		YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	YES		

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION						
Watershed ID #:		91		DEER CR > S YAMHILL R - AT MOUTH		
Time: 10:23 AM		Basin: WILLAMETTE			Exceedance Level: 80	
		Date: 09/07/2016				
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	104.00	2.48	102.00	0.00	80.00	21.50
FEB	125.00	2.47	123.00	0.00	80.00	42.50
MAR	101.00	2.44	98.60	0.00	80.00	18.60
APR	60.90	2.49	58.40	0.00	80.00	-21.60
MAY	31.40	3.61	27.80	0.00	80.00	-52.20
JUN	15.60	4.96	10.60	0.00	25.00	-14.40
JUL	8.47	6.96	1.51	0.00	15.00	-13.50
AUG	6.06	6.00	0.06	0.00	8.00	-7.94
SEP	5.25	4.10	1.15	0.00	6.00	-4.85
OCT	5.36	2.42	2.94	0.00	40.00	-37.10
NOV	16.20	2.29	13.90	0.00	80.00	-66.10
DEC	77.70	2.44	75.30	0.00	80.00	-4.74
ANN	62,400	2,580	59,900	0	39,400	28,700

DETAILED REPORT OF INSTREAM REQUIREMENTS															
Watershed ID #:		91		DEER CR > S YAMHILL R - AT MOUTH										Basin: WILLAMETTE	
Time: 10:24 AM														Date: 09/07/2016	
Application Number	Status	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
Monthly values are in cfs.															
MF91A	CERTIFICATE	80.0	80.0	80.0	80.0	80.0	25.0	15.0	8.0	6.0	40.0	80.00	80.0		
IS73563A	CERTIFICATE	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.50	1.5		
MAXIMUM		80.0	80.0	80.0	80.0	80.0	25.0	15.0	8.0	6.0	40.0	80.0	80.0		

Well Location Map



Water-Levels

