

Groundwater Application Review Summary Form

Application # G- 18739 (re-review #2)

GW Reviewer Travis Brown Date Review Completed: 8/28/2020

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).

WATER RESOURCES DEPARTMENT

MEMO

August 28, 2020

TO: Application G- 18739 (re-review #2)

FROM: GW: Travis Brown
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

YES The source of appropriation is hydraulically connected to a State Scenic Waterway or its tributaries

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 8/28/2020
 FROM: Groundwater Section Dennis Orłowski / Travis Brown
Original Reviewer's Name / Re-Reviewer's Name
 SUBJECT: Application G- 18739 (re-review #2) Supersedes review of 5/22/2019 & 4/13/2020
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: Weyerhaeuser NR Company County: Marion

A1. Applicant(s) seek(s) 4.30 3.57 cfs from 4 2 1 well(s) in the Willamette Basin,
North Santiam River - Calapooia River subbasin

A2. Proposed use Temperature Control (TC) Seasonality: October through May

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	MARI16010	Well 1	Alluvium	10.79	T10S/R2W-4 SE-SW	250' N, 1940' E fr SW cor S4 (note 1)
2-1	MARI16018	Greenhouse-Well	Alluvium	10.79 1.34*	T10S/R2W-4 SE-SW	250' N, 2000' E fr SW cor S4* (note 1)
3	MARI16019	Well 2	Alluvium	10.79	T10S/R2W-9 SW-NW	1760' S, 1250' E fr NW cor S9 (note 1)
4-2	MARI16020	Shop-Well	Alluvium	10.79 2.23	T10S/R2W-4 SW-SW	420' N, 1150' E fr SW cor S4 (note 1)
1	Proposed	New Greenhouse Well	Alluvium	3.57	T10S/R2W-4 SE-SW	250' N, 2020' E fr SW cor S4 ^b

* 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	286	--	7.67	11/17/1967	30	0-18	0-30	--	18-30	2975	3.5	Pump
2-1	287	--	10	6/16/1973	35	0-18	+1-35	--	19-34	600	0.5	Pump
3	283	--	11	7/1/1990	50	0-19	+1-33	--	17-33	2770	13	Pump
4-2	285	--	11	5/26/1970	40	0-20	+1-40	--	22-40	1000	11	Pump
1	287	N/A	N/A	N/A	30	0-18	0-18 (16")		18-30	N/A	N/A	N/A

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU are located ~2.5 miles east of Jefferson, Oregon.

~~* MARI 16018 is an authorized POA under Cert 49070 for 0.03 cfs of Temperature Control/Irrigation and under Cert 49071 for 0.66 cfs of Temperature Control/Irrigation. With this application, the combined rate for MARI 16018 would total 2.03 cfs, and the combined overall rate (from both MARI 16018 and MARI 16020) would total 4.26 cfs.~~

~~**Note 1:** Compared to the PLSS data and georeferenced aerial imagery used by OWRD, these "metes and bounds" location descriptions, which are those provided in the application, appear to be uniformly offset by about 180 ft to the SSE. This discrepancy is evident by noting the described well locations relative to buildings and other structures as plotted on the application map: the "metes and bounds" descriptions uniformly place the wells about 180 ft SSE from the same locations shown on the application map. **Therefore, for this review the well locations as plotted on the application map were evaluated, and NOT the "metes and bounds locations shown in this Table A3 (and the application).**~~

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: One of the four proposed POAs, MARI 16019, obtains groundwater from an unconfined alluvial aquifer and is located less than 1/4 mile from the North Santiam River. Therefore, the provisions of OAR 690-502-0240 are activated for MARI 16019. The other three wells also produce from an unconfined aquifer but are located greater than 1/4 mile from the river, so OAR 690-502-0240 does not apply to those wells.~~

- 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) **Large water-use reporting, 7N (annual measurements)**;
 - 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 unconfined alluvial 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 application is not consistent regarding the requested total maximum rate versus individual well rates. Section 3 notes 10.79 cfs for the total requested maximum rate, with no well specific rates provided on the Section 3 table; in that case, the full 10.79 cfs would be evaluated for each of the four proposed POAs. However, Section 10 does indicate proposed general allocations for the four proposed POAs: “The 52.6 acres TC (10.07 cfs) will come from Wells 1 (MARI 16010) and 2 (MARI 16019) and the 3.0 acres TC plus the 4.4 acres TC (0.72 cfs) will come from the Greenhouse well (MARI 16018) and/or the Shop Well (MARI 16020).” This distribution is reasonable given the relative well yields reported on well logs for the proposed POAs: MARI 16010 and MARI 16019 report relatively much greater yields and specific capacity values than MARI 16018 and MARI 16020, ranging from 6.2 to 6.6 cfs for the former two wells versus lower 1.3 to 2.2 cfs for the latter two wells. Additional information confirming these general well specific rates was subsequently provided to OWRD by the applicant’s agent (5/20/2019 e-mail from Will McGill (CWRE) to Barbara Poage (OWRD), attached to this review).~~

~~Although currently unlikely, it is possible that Well 1 or Well 2 could potentially produce the full 10.07 cfs (~4520 gpm) individually, particularly if either well were to be deepened in the future. Therefore, for injury potential and PSI the conservative scenario evaluated for this review was either Well 1 (MARI 16010) or Well 2 (MARI 16019) pumping individually at a maximum 10.07 cfs rate.~~

~~Furthermore, Section 5 of the application lists a total requested annual volume of 642 acre feet. Additional information provided by the applicant’s agent (see attached e-mail) explained that the requested 642 acre feet is primarily based on pumping 10.07 cfs for spraying on 52.6 acres over a total 30-day period of usage, i.e., during major freezing events each year. Additional volume is requested to provide additional TC for another 7.4 acres that are insufficiently covered by existing TC water rights. The requested 642 acre feet of annual volume equates to 10.7 acre feet/acre.~~

~~MARI 16010, 16018, and 16019 are also authorized POAs for three other groundwater certificates for irrigation and temperature control; however, those total allocations are relatively much lower than this requested allocation.~~

Groundwater development is relatively low in this area. Limited groundwater data shows general stability from measurements in one nearby well, MARI 50649. The unconfined alluvial aquifer system is highly transmissive due to thick water-bearing deposits of coarse gravel (cobbles to boulders) and sand and the efficient hydraulic connection to the North Santiam River (Conlon and others, 2005; Gannett and Caldwell, 1998). Due to the strong connection to the river, much water pumped by the proposed POA would likely originate from the river, particularly during high streamflow conditions that exist during the wet season period that corresponds to this application’s proposed period of use (October through May). **These factors, particularly the period of use that would not conflict with dry season irrigation pumping, would greatly mitigate potential injury to other users.**

Despite the apparently low potential for injury to existing authorized groundwater users, the listed permit conditions are recommended to help manage and protect the groundwater 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 (“Well 1”)	Alluvium	<input type="checkbox"/>	<input type="checkbox"/>
2-1 (“Greenhouse Well”)	Alluvium	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3 (“Well 2”)	Alluvium	<input type="checkbox"/>	<input type="checkbox"/>
4-2 (“Shop Well”)	Alluvium	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1 (“New Greenhouse Well”)	Alluvium	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer confinement evaluation: All four Both The proposed wells are is shallow (<50 ft), there are no appreciable deposits of confining material, and static groundwater levels are approximately coincident with the uppermost water-bearing deposits. All of these factors indicated unconfined aquifer 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
1 (“Well 1”)	1	North Santiam River	260-280	250-290	1560	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2-1 (“Greenhouse Well”)	1	North Santiam River	260-280	250-290	1500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3 (“Well 2”)	1	North Santiam River	260-280	250-290	700	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4-2 (“Shop Well”)	1	North Santiam River	260-280	250-290	2300	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1 (“New Greenhouse Well”)	1	North Santiam River	260-280	250-290	1440	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: All Both The proposed wells are is shallow (<50 ft deep) and completed in an unconfined alluvial aquifer with groundwater levels that are generally consistent with the elevation of SW#1 within approximately one mile.

Water Availability Basin the well(s) are located within: WID 141: North Santiam River > Santiam River – 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	Instream Water	Qw > 1%	80% Natural	Qw > 1% of 80%	Interference @ 30 days	Potential for Subst.
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				Right ID	Right Q (cfs)	ISWR?	Flow (cfs)	Natural Flow?	(%)	Interfer. Assumed?
1	1	<input type="checkbox"/>	<input type="checkbox"/>	MF141A	430	<input type="checkbox"/>	694	<input type="checkbox"/>	<25%	<input type="checkbox"/>
2	1	<input type="checkbox"/>	<input type="checkbox"/>	MF141A	430	<input type="checkbox"/>	694	<input type="checkbox"/>	<25%	<input type="checkbox"/>
1	1	<input type="checkbox"/>	<input type="checkbox"/>	MF141A	430	<input type="checkbox"/>	694	<input type="checkbox"/>	<25%	<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?		Potential for Subst. Interfer. Assumed?
1 ("Well 1")	1		<input checked="" type="checkbox"/>	MF141A	430	<input checked="" type="checkbox"/>	694	<input checked="" type="checkbox"/>	<25%	<input checked="" type="checkbox"/>
2 ("Greenhouse Well")	1		<input type="checkbox"/>	MF141A	430	<input type="checkbox"/>	694	<input type="checkbox"/>	<<25%	<input type="checkbox"/>
3 ("Well 2")	1		<input checked="" type="checkbox"/>	MF141A	430	<input checked="" type="checkbox"/>	694	<input checked="" type="checkbox"/>	-13%	<input checked="" type="checkbox"/>
4 ("Shop Well")	1		<input type="checkbox"/>	MF141A	430	<input type="checkbox"/>	694	<input type="checkbox"/>	<<25%	<input type="checkbox"/>
All POA	1		<input type="checkbox"/>	MF141A	430	<input type="checkbox"/>	694	<input type="checkbox"/>		<input type="checkbox"/>

Comments: C3a: not applicable (see discussion in Section B3 of this review)

~~C3b: As discussed in Section B3, although well specific rates were not explicitly provided in the application, additional clarification provided by the applicant's agent (see attached e-mail) did indeed indicate that two of the four proposed POAs are intended to provide the majority of water. Thus, for this review it was assumed that either Wells 1 or 3 could at some future time potentially produce 10.07 cfs individually, particularly if either well were to be deepened in the future. With that assumption, both Wells 1 and 3 clearly trigger the "Qw > 5 cfs" PSI criterion. However, even if this assumption is not realized in the future, i.e., if the 10.07 cfs is always roughly divided between the two wells as indicated by the applicant, other PSI criteria would still be triggered.~~

Based on the criteria of OAR 690-009-0040, the Potential for Substantial Interference (PSI) is not assumed for the proposed POA (Table C3a), either of the individual POA (Table C3a) nor for the combined rate of withdrawal (Table C3b).

~~Also, For this analysis the 80% natural flow value (694 cfs) is the lowest monthly rate (October) corresponding to the proposed period of use, which is October through May. The ISWR rate of 430 cfs is the same for every month of the year.~~

~~The Hunt 1999 analytical stream depletion model was used to estimate 30-day interference at SW1 (North Santiam River) caused by pumping Well 3 (applicant's "Well 2") continuously at 10.07 cfs for 30 day Well 2 (MARI 16018) — as the closest to SW 1 — the proposed POA continuously for 30 days. This most conservative scenario resulted in an estimated 13% of interference at 30 days; other pumping scenarios will result in less estimated depletion. Results of this analysis indicate that interference with SW 1 due to the proposed use is anticipated to be less than 25 percent of the rate of pumping (see attached Stream Depletion Analysis).~~

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													
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:** None

References Used:

Application G-18739 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.

Hunt, B., 1999, Unsteady stream depletion from ground water pumping: Ground Water, v. 37, no. 1, p. 98-102.

D. WELL CONSTRUCTION, OAR 690-200

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

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

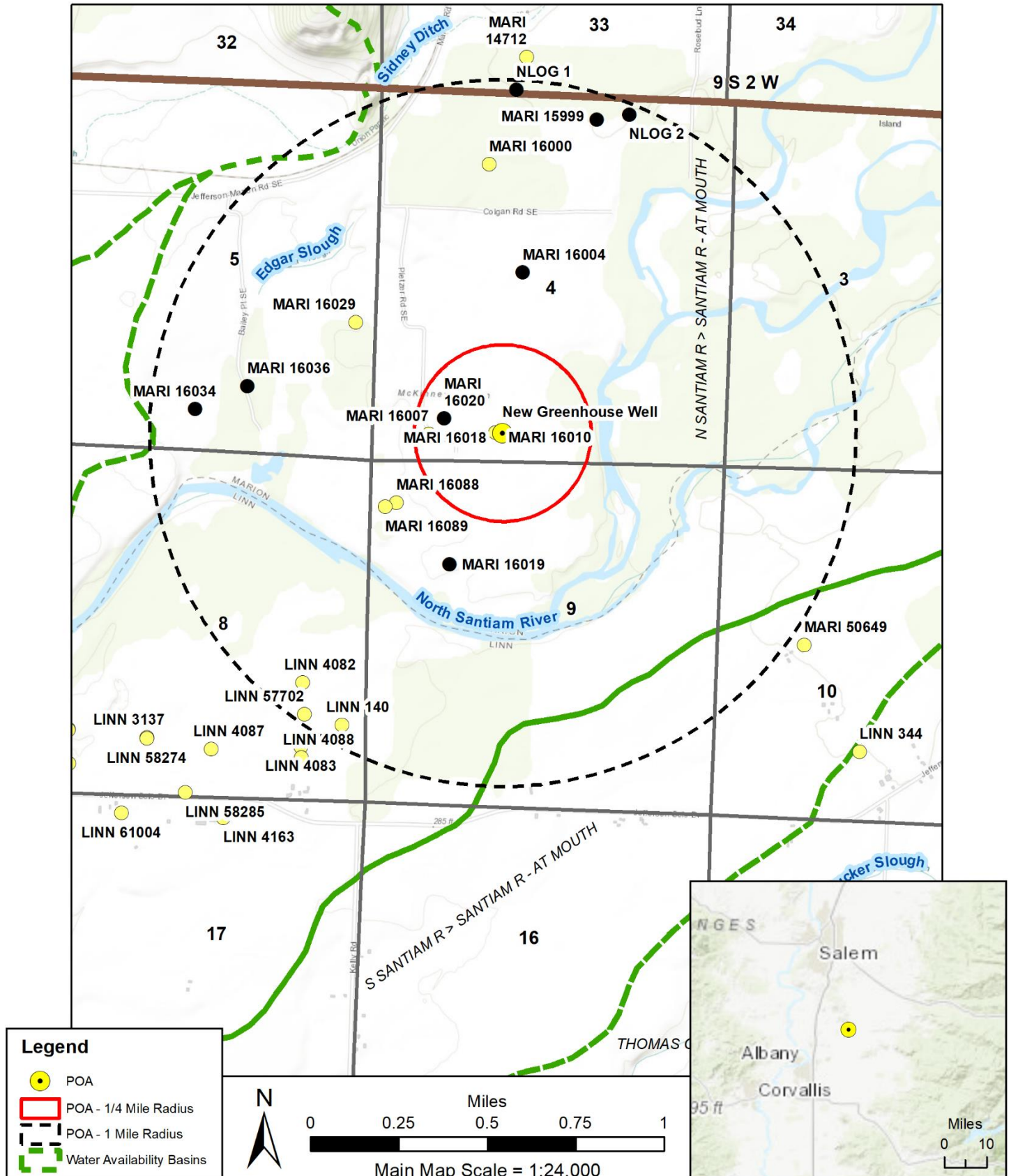
- a. review of the well log;
- b. field inspection by _____;
- c. report of CWRE _____;
- d. other: (specify) _____

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.**

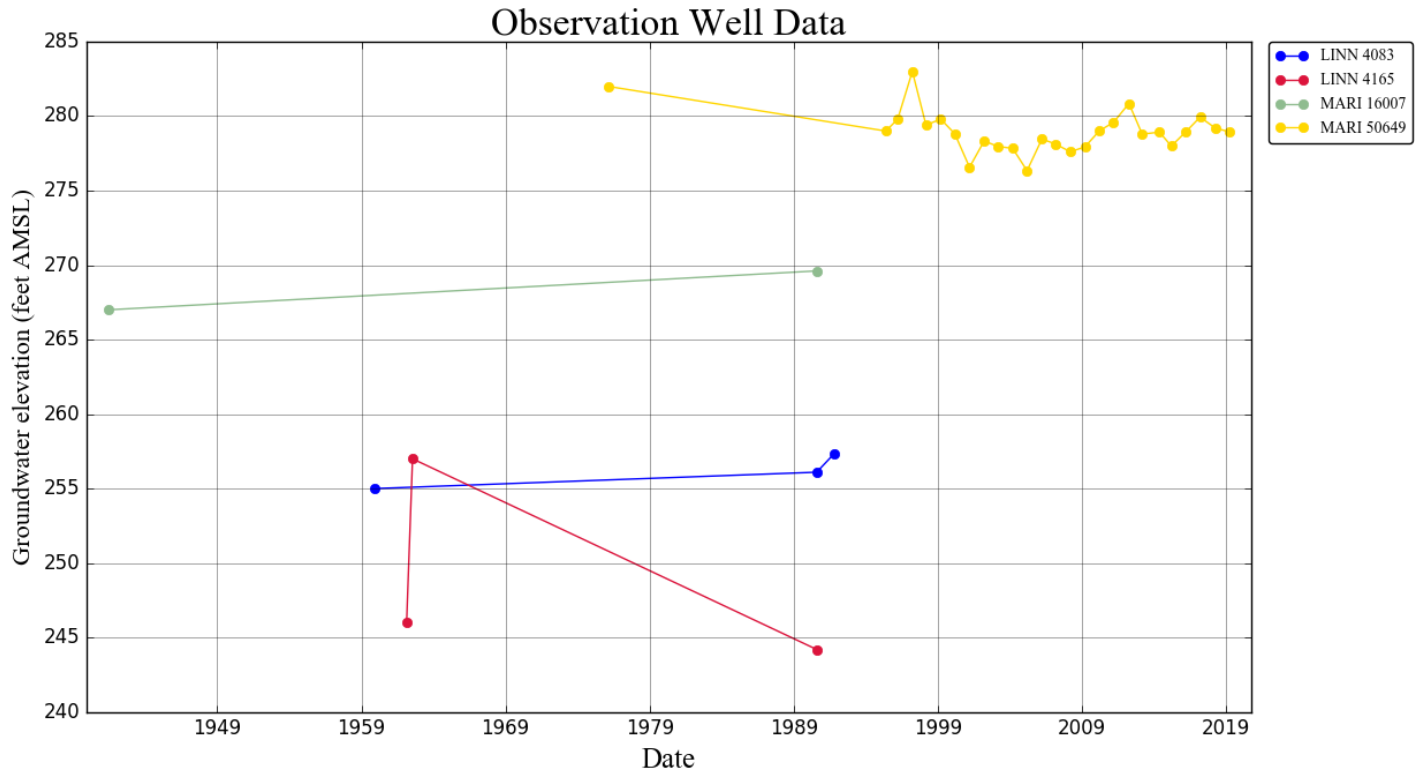
Well Location Map

G-18739 Weyerhaeuser (re-review #2)



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Water-Level Trends in Nearby Wells



Water Availability Table

Oregon Water Resources Department
Water Availability Analysis

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Water Availability Analysis

Detailed Reports

N SANTIAM R > SANTIAM R - AT MOUTH
WILLAMETTE BASIN

Water Availability as of 5/22/2019

Watershed ID #: 141 [\(Map\)](#)

Date: 5/22/2019

Exceedance Level: 80%

Time: 11:21 AM

- 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	2,330.00	480.00	1,850.00	0.00	430.00	1,420.00
FEB	2,670.00	1,490.00	1,180.00	0.00	430.00	751.00
MAR	2,540.00	1,320.00	1,220.00	0.00	430.00	792.00
APR	2,500.00	1,480.00	1,020.00	0.00	430.00	589.00
MAY	2,590.00	802.00	1,790.00	0.00	430.00	1,360.00
JUN	1,500.00	434.00	1,070.00	0.00	430.00	636.00
JUL	858.00	337.00	527.00	0.00	430.00	97.30
AUG	661.00	317.00	344.00	0.00	430.00	-85.90
SEP	627.00	294.00	333.00	0.00	430.00	-97.50
OCT	684.00	264.00	430.00	0.00	430.00	-22.00
NOV	1,380.00	266.00	1,110.00	0.00	430.00	684.00
DEC	2,540.00	267.00	2,270.00	0.00	430.00	1,840.00
ANN	1,960,000.00	463,000.00	1,500,000.00	0.00	312,000.00	1,190,000.00

Stream Depletion Analysis

Application type:	G
Application number:	18739
Well number:	1
Stream Number:	1
Pumping rate (cfs):	2.03
Pumping duration (days):	240.0
Pumping start month number (3=March)	10.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	1440	1440	1440	ft
Aquifer transmissivity	T	5000.0	25000.0	50000.0	ft ² /day
Aquifer storativity	S	0.15	0.15	0.15	-
Aquitard vertical hydraulic conductivity	Kva	0.1	0.1	0.1	ft/day
Not used		0	0	0	
Aquitard thickness below stream	babs	3.0	3.0	3.0	ft
Not used		0	0	0	
Stream width	ws	175.0	175.0	175.0	ft

Stream depletion for Scenario 2:

Days	10	120	150	180	210	240	270	300	330	360	30	60	90
Depletion (%)	5	30	33	36	39	41	30	23	20	17	13	21	26
Depletion (cfs)	0.10	0.61	0.68	0.73	0.78	0.82	0.60	0.48	0.40	0.34	0.26	0.42	0.53

