This Groundwater Technical Review and the included analysis help inform the Water Rights Section's review of whether the proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525 and ORS 537.621. The Water Rights Section also considers other information sources when making its public interest determination, including watermaster input, any comments received, input from other agencies, other Commission rules not evaluated as part of the Groundwater Review, and other information.

PUBLIC INTEREST TECNNICAL REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date: 11/17/2026

FROM: Groundwater Section Aaron Orr/Travis Brown
Reviewer's Name

SUBJECT: Application _G_ - _ 19517 _ Supersedes review of _____

Date Reviewed by GW Lead and Returned to WRSD: Travis Brown, 11/17/2026

PUBLIC INTEREST PRESUMPTION: GROUNDWATER

OAR 690-310-0130 (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 if
(a) The proposed use is allowed in the applicable basin program established pursuant to ORS 536.300 and 536.340 or given a preference under ORS 536.310(12);
(b) Water is available;
(c) The proposed use will not injure other water rights; and
(d) The proposed use complies with the rules of the Commission.

Department staff review groundwater applications under OAR 690-310-0140 to determine whether the presumption is established and may modify or condition the proposed use 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:

A1. Application

Applicant's Name: Knife River Inc. County: LINN

Applicant(s) seek(s) 0.5 cfs from 2 well(s) in the Willamette Basin, Mainstem Willamette subbasin

Proposed use Industrial Seasonality: Year-round

Application _G_–___19517 __ Date: 11/17/2026

A2. Well and aquifer data:

A2 a: Well identifiers, aquifer, rate, and location

POA Well	Well Log ID	Applicant's Well #	Proposed Aquifer	Proposed Rate (cfs)	Location (T/R-S QQ-Q)	Latitude	Longitude
1	LINN 64655	WELL 5	Quaternary-Late Tertiary sediment Aq	0.5	15S/4W-9 NE-SE	44.27747	-123.17252
2	LINN 14110	WELL 6	Quaternary-Late Tertiary sediment Aq	0.5	15S/4W-9 NE-SE	44.27724949	-123.1725779

A2 b: Well construction information by depth below land surface. All units in feet.

POA Well	Seal		Casing		Filter Pack		Open / Perforation / Screen		Well Bottom
	Min	Max	Min	Max	Min	Max	Min	Max	
1	0	18	-3.5	56.5	0	N/A	56.5	60	60
2	0	19	0	38	0	N/A	20	36	38

A2 c: Well construction information by elevation above mean sea level. All units in feet.

POA Well	Land Surface Elevation	Seal		Casing		Filter Pack		Open / Perforation / Screen		Well Bottom
		Min	Max	Min	Max	Min	Max	Min	Max	
1	310.6	310.6	292.6	314.1	254.1	310.6	N/A	254.1	250.6	250.6
2	303	303	284	303	265	303	N/A	283	267	265

A2 d: Information relevant to water levels, including land surface elevation, depth of first water, recent annual high level, and reference levels for permit conditions

POA Well	Depth of First Water from Well Log (ft bls)	Shallowest Static Water Level (ft bls)	Most Recent Annual High WL		Reference Levels for:				Well Tests			
					RSGL	Permit Conditions			(max yield on well log)			
			Depth (ft bls)	WL Date	Depth (ft bls)	Depth (ft bls)	Date	Pro-visional?	Yield (gpm)	Draw-down (ft)	Test Type	Duration (hours)
1	21	N/A	N/A	N/A	TBD	TBD	TBD	TBD	80	N/A	A	1
2	N/A	10	14.3	10/1/1973	TBD	TBD	TBD	TBD	3.3	20	B	1

Use data from application for proposed wells.
"SWL" = static water level (most recent or representative SWL). "amsl" = above mean sea level. "bls" = below land surface

Comments: _____

A3. Description of hydrogeologic setting / conceptual model:

POA 1 (LINN 64655) and POA 2 (LINN 14110) are completed in alluvial terrace deposits ("Qtg" or "Qtf") of the Willamette Valley (McClaughry et al., 2010). Deposits are Quaternary in age and are characterized by unconsolidated to semi-consolidated deposits of gravel, sand, silt, and clay (McClaughry et al., 2010). The equivalent hydrogeologic units are the Upper Sedimentary Unit and the Middle Sedimentary Unit of the Willamette Aquifer, which are both between 20- and 40-feet thick in the vicinity of the POAs (Gannett and Caldwell, 1998). The presence of cemented gravel 36 feet bgs in LINN 14110 suggests that the Upper Sedimentary Unit is closer to 40-feet thick in this area. Coincident with the Upper Sedimentary Unit is the Willamette Silt Unit, which is approximately 10-feet thick in the vicinity of the POA (Gannett and Caldwell, 1998). These deposits are typically micaceous silts and clays characterized by rhythmic bedding patterns associated with the Missoula floods (O'Connor et al., 2001; Conlon et al., 2005). Based on well construction and the relatively thin and variable thicknesses of the aforementioned sedimentary deposits, POAs 1 and 2 are likely completed in the Upper Sedimentary Unit, or completed in both the Upper Sedimentary Unit and Middle Sedimentary Unit.

The nearest stream is the Willamette River to the west. Groundwater generally flows northwest towards the river. Recharge in the Willamette Basin is predominantly from the infiltration of precipitation into the groundwater system (Conlon et al., 2005). Although the well construction reports for the proposed POA wells indicate water levels above the shallowest reported water bearing zones, the proximity of the proposed POA wells to the edge of the terrace deposits and the fact that water levels appear to be approximately coincident with the elevation of the Willamette River means the aquifer here is very likely unconfined.

B. BASIN PROGRAM:

OAR 690-310-0130 (1)(a)

B1. ☒ **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 proposed POA wells will develop an unconfined aquifer within ¼ mile of the Willamette River. Per OAR 690-502-0240, the groundwater developed by the proposed POA wells shall be classified the same as the surface source. The Willamette River at this location is classified for Industrial Use (among other uses).

B2. ☐ **Well(s) #** _____ , ____ , _____ , _____ , _____ , are limited by an administrative restriction under the applicable basin program.
Comments: _____

C. WATER AVAILABILITY:

OAR 690-310-0130 (1)(b)

OAR 690-300-0010(57): "Water is Available" […] means: […]

(d) The proposed groundwater source exhibits Reasonably Stable Groundwater Levels, as defined in OAR 690-008-0001; and

(e) The total requested rate of groundwater allocation is obtainable by the expected yield of the well(s) proposed in the application given best available information; and

(f) The proposed groundwater use does not have the Potential for Substantial Interference (OAR 690-009-0020(5)) with a surface water source [that does not have water available]

C1. Reasonably Stable Groundwater Levels

OAR 690-008-0001 (9): "Reasonably Stable Groundwater Levels" means that Annual High Water Levels, based on observed trends over time, remain within a range consistent with sustaining the function and character of a groundwater reservoir indefinitely, and:

(a) The Annual High Water Levels as measured at one or more representative wells in a groundwater reservoir or part thereof:

(A) indicate no decline or an average rate of decline of less than 0.6 feet per year over any immediately preceding averaging period with duration between 5 and 20 years. Four Annual High Water Levels are required to calculate the rate of change; one must have been measured in the year to which the evaluation of reasonably stable applies, and at least one must have been measured between 5 and 20 years prior; and

(B) have not declined by more than 25 feet from a reference level to the level in the year to which the evaluation of reasonably stable applies. The reference level shall be the highest known water level unless Annual High Water Levels have been measurably increased by human activity, in which case the Department may set a different reference level using best available information.

(b) If water level data are insufficient to perform either test in (a) for a given year, then the Department will presume that groundwater levels are not reasonably stable unless:

(A) the most recent evaluation of reasonably stable applies to a year within 5 years of the given year, in which case the Department may presume that the recent evaluation still applies; or

(B) groundwater has not yet been extracted or authorized for extraction from the groundwater reservoir, in which case the Department may presume that groundwater levels are reasonably stable.

(c) The Department may evaluate Reasonably Stable Groundwater Levels for the year of the priority date of a groundwater right application or for a later year if more recent data are available.

C1a. If part (a) of 690-008-0001(9) has been superseded by a basin program rule as per 690-008-0001(9)(B)(d) proceed to C1c. List one or more representative wells in the proposed groundwater reservoir or part thereof that have sufficient data to evaluate part (a) of 690-008-0001(9). Both the Rate (OAR 690-008-0001(9)(a)(A)) and Magnitude (OAR 690-008-0001(9)(a)(B)) tests for a given well must be passed in order to find that the water levels are Reasonably Stable. It is not necessary to include all POAs proposed on this application into this table, as long as they all access the same part of the groundwater reservoir and have the same reasonable stability status indicated in C1b below. If some POAs are found to be reasonably stable while others are not, then all the POAs on the application should be included in the table below, with their POA number indicated in the second column. In that situation, the reviewer does not need to indicate in this table which wells are considered representative for determining reasonable stability status for different POAs, but they should describe those relationships in the comments below.

Well Log ID	POA Well #	Reference Level for Evaluation of Reasonable Stability (ft bls)	Rate Test	Magnitude Test	Water Levels Reasonably Stable
LINN 56537	N/A	N/A	Pass	Pass	Reasonably Stable
LINN 56538	N/A	N/A	Pass	Pass	Reasonably Stable

Comments: Alluvial wells with water level data within ~1 mile of the proposed POA show Reasonably Stable water level trends.Variations in static water levels year over year is likely tied to the hydraulic connection between the wells and the Willamette River (Conlon et al., 2005).

C1b. Summary finding for this application. Check only one primary finding. It is possible that different proposed POAs could access different parts of the GW reservoir, and for some of those parts to be Reasonably Stable while others are not. In that case, summary finding for the application should be "Not Reasonably Stable," and the reviewer should indicate which POAs access part(s) of the groundwater reservoir that are Reasonably Stable. OAR 690-008-0001(9)(a): *Annual High Water Levels as measured at one or more representative wells in a groundwater reservoir or part thereof*:

☒ **Are Reasonably Stable**
- ☐ Groundwater has not yet been extracted or authorized for extraction from the groundwater reservoir

☐ **Are Not Reasonably Stable**
- ☐ If some Proposed POAs are Reasonably Stable, list the Reasonably Stable POAs here: _____

☐ **Sufficient data are not available to evaluate reasonable stability**

List representative wells identified during review that could be measured in order to overcome a finding of Insufficient Data: _____

Comments: All representative wells appear Reasonably Stable.

C1c. OAR 690-008-0001(d): Evaluation for reasonably stable water levels per superseding basin program rules OAR 690-_____ for the _____ administrative basin.

Comments: N/A

C2. Well Yield

C2a. OAR 690-300-0010(57)(e): Is the total requested rate of groundwater allocation obtainable by the expected yield of the well(s) proposed in the application given best available information?

☒ **Yes** ☐ **No**

Comments: The median reported rate for wells (n=134) in surrounding TRS sections (T15S, R4W, Sections 9,10,15,16, approximately 1-mile radius) is 37.5 gpm. The maximum reported rate for wells in the same area is 900 gpm. The requested rate of 0.5 cfs (~225 gpm) is within the range of reported rates.

C3. Groundwater Interference with Surface Water

OAR 690-300-0010(57): "Water is Available", when used in OAR 690-310-0080, 690-310-0010 and 690-310-0130, means […]:
(f) The proposed groundwater use does not have the Potential for Substantial Interference (OAR 690-009-0020(5)) with a surface water source [that is not available for further appropriation]

OAR 690-009-0040: (1) When evaluating a Proposed Groundwater Use, Hydraulic Connection and the Potential for Substantial Interference with a surface water source shall be determined by the Department according to these rules. These determinations shall be based upon the application of generally accepted hydrogeologic principles using best available information concerning the hydrologic system of interest and the well(s) under consideration.

(a) Appropriate information that is provided in the application or in the public comment period for the application shall be considered in the process of making these determinations.

(b) Best available information may include, but is not limited to, pertinent water well reports, aquifer test analyses, hydrologic and geologic studies and reports, groundwater and surface water elevation data, available numerical and analytical groundwater flow models, and any other information that is used in applying generally accepted hydrogeologic principals and methodologies.

(2) A determination of Hydraulic Connection is a prerequisite for a determination of the Potential for Substantial Interference.
(3) A determination of the Potential for Substantial Interference with a surface water source shall at a minimum include application of the generally accepted hydrogeological principles described in "Streamflow Depletion by Wells – Understanding and Managing the Effects of Groundwater Pumping on Streamflow" by P. M. Barlow and S. A. Leake, 2012.
(4) The Potential for Substantial Interference with a surface water source exists if the well(s) under consideration will, over the full term of the proposed or authorized groundwater use, obtain water from Streamflow Depletion.

OAR 690-009-0020(4): "Hydraulic Connection" means saturated conditions exist allowing water to move between two or more sources of water, either between groundwater and surface water or between groundwater sources.

OAR 690-009-0020 (7) "Streamflow Depletion" means a reduction in the flow of a surface water source due to pumping a hydraulically connected groundwater source. Streamflow Depletion encompasses:
(a) captured groundwater that would otherwise discharge to a surface water source; or
(b) induced infiltration from a surface water source to the hydraulically connected groundwater source.

C3a. OAR 690-009-0020(5): *Potential for Substantial Interference", or "PSI", means that a groundwater use will cause streamflow depletion based on the assessments described in OAR 690-009-0040, and therefore may cause or has caused substantial interference with or undue interference with a surface water source, based on the definitions in OAR 690-008-0001.*

Summary of surface water sources evaluated for hydraulic connection and Potential for Substantial Interference. For hydraulic connection and potential for substantial interference, a value of 1 means yes, and blank means no.

POA Well	WRD Streamcode	Streamcode Surface Water Name	Water Availability Basin (WAB)	WAB Watershed ID	Hydraulically Connected	Potential for Substantial Interference
1	**021140**	**Willamette River**	**WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CR AT GAGE 14174**	**14174000**	**1**	**1**
1	**02114014100010**	**Muddy Creek**	**MUDDY CR > E CHANNEL - AT MOUTH**	**30200303**	**1**	
2	**021140**	**Willamette River**	**WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CR AT GAGE 14174**	**14174000**	**1**	**1**
2	**02114014100010**	**Muddy Creek**	**MUDDY CR > E CHANNEL - AT MOUTH**	**30200303**	**1**	

Comments**:** The proposed POA wells are situated between the Willamette River ~450 ft to the west and Muddy Creek ~12,200 ft to the east. Both streams are hydraulically connected to the alluvial aquifer system. However, the Willamette River likely has a much more efficient hydraulic connection given its much greater width (~10 times the width of Muddy Creek), depth, and incision into the alluvial aquifer. A quantitative estimate of the fraction of total depletion that would accrue to each stream based solely on the relative proximity of the proposed POA wells indicates that greater than 99% of the total depletion would be anticipated to accrue to the Willamette River; given the requested rate of 0.5 cfs, less than 0.0007 cfs of depletion would be anticipated to accrue to Muddy Creek (see attached Inverse Distance Apportionment). Accounting for the much more efficient hydraulic connection of the alluvial aquifer to the Willamette River relative to Muddy Creek, the actual peak rate of depletion for Muddy Creek would likely be substantially less than the 0.0007 cfs estimated solely by the Inverse Distance Apportionment. It should also be noted that water users are only required to report their use to the thousandth of a cfs (OAR 690-14-0100(13)). The proposed use appears unlikely to deplete Muddy Creek in any meaningful way; therefore, the Potential for Substantial Interference does not exist (OAR 690-009-0040(4)).

List all surface water sources identified to have PSI and their associated Water Availability Basin:

WRD Streamcode	Streamcode Surface Water Name	Water Availability Basin (WAB)	WAB Watershed ID
1	**Willamette River**	**WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CR AT GAGE 14174**	**14174000**
2	**Willamette River**	**WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CR AT GAGE 14174**	**14174000**

Comments**:** The proposed use will deplete the flow of the Willamette River, the Water Availability Calculation for which is attached.

D. INJURY:

OAR 690-310-0130 (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 if…(c) The proposed use will not injure other water rights.

To make a finding of injury to an existing water right, the Department must make a finding of "Substantial Interference" as defined in OAR 690-008-0001(10). The finding of "Substantial Interference" with a surface water right is made by the Water Rights Services Division based on the evaluation in section C3. Sections D1 and D2, below, address the finding of "Substantial Interference" with a groundwater right.

OAR 690-008-0001(10): "Substantial or Undue interference", means the spreading of the cone of depression of a well to intersect a surface water source or another well, or the reduction of the groundwater levels as a result of pumping or otherwise extracting groundwater from an aquifer, which contributes to:

(b)The groundwater level being drawn down to the Economic Pumping Level of the senior appropriator(s); or

(c) One or more of the senior groundwater appropriators being unable to obtain either the permitted or customary quantity of groundwater, whichever is less, from a reasonably efficient well that fully penetrates the aquifer where the aquifer is relatively uniformly permeable. However, in aquifers where flow is predominantly through fractures, full penetration may not be required as a condition of substantial or undue interference.

D1a. OAR 690-008-0001(10): Will the proposed groundwater use result in substantial or undue interference with an existing groundwater user?

☐ **Yes** ☐ **No** ☒ **No, as long as the permit is conditioned as indicated in item F below.**

Comments: The nearest known neighboring well is LINN 2123, ~810 ft north of Well 5 (LINN 64655). Given the proposed POA wells' proximity to the Willamette River with its efficient hydraulic connection to the alluvial aquifer, injury of LINN 2123 or other nearby wells is unlikely. However, the conditions specified in Item F, below, are recommended to protect senior users and the groundwater resource.

E. OTHER RULES OF THE COMMISSION:

OAR 690-310-0130 (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 if…(d) The proposed use complies with the rules of the Commission.

E1. OAR 690-200, 690-210 and 690-215: Well Construction

Identify any notable well construction deficiencies or hydrogeologic considerations to support review by Well Construction & Compliance.

E1a. Well #: _____ Logid: _____

E1b. Well construction deficiency or other comment is described as follows: _____

E2. OAR 690-310-0260: Water Rights Within or Above State Scenic Waterways

E2a. Are any of the proposed sources of appropriation hydraulically connected to a State Scenic Waterway or its tributaries?

☐ **Yes** ☒ **No**

Hydraulically connected State Scenic Waterway: N/A

Comments: _____

E2b. Per ORS 390.835, is the Groundwater Section able to calculate ground water interference with surface water that contributes to a Scenic Waterway?

☐ **Yes. The calculated interference is distributed below:**

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 "No" option below, 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 [Enter] 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

☐ **No. 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.**

Comments: _____

E3. Other Relevant Rules of the Commission:

Comments: _____

F. RECOMMENDED MODIFICATIONS OR CONDITIONS:

OAR 690-310-0140(2): If the Department determines that the presumption is not established, the Department shall determine whether the proposed use will impair or adversely affect the public welfare, safety and health under ORS 537.525 and may either:
(a) Propose denial of the application upon a finding that the use will impair or adversely affect the public welfare, safety and health; or
(b) Make specific findings to demonstrate that even though the presumption is not established, the proposed use will not impair or adversely affect the public welfare, safety and health and propose approval of the application with appropriate modifications or conditions.

Based on the findings in sections A-D above, the following conditions are recommended if the permit is approved:

7RLN, Large Water Use Reporting

REFERENCES:

Conlon, T.D., Lee, K.K., and Risley, J.R., 2003, Heat tracing in streams in the central Willamette Basin, Oregon, in Stonestrom, D.A. and Constantz, Jim, eds., Heat as a tool for studying the movement of groundwater near streams: U.S. Geological Survey Circular 1260, chapter 5, p. 29-34.

Gannett, M.W. and Caldwell, R., 1998, *Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington*, Professional Paper 1424-A, 32 p: U. S. Geological Survey, Reston, VA.

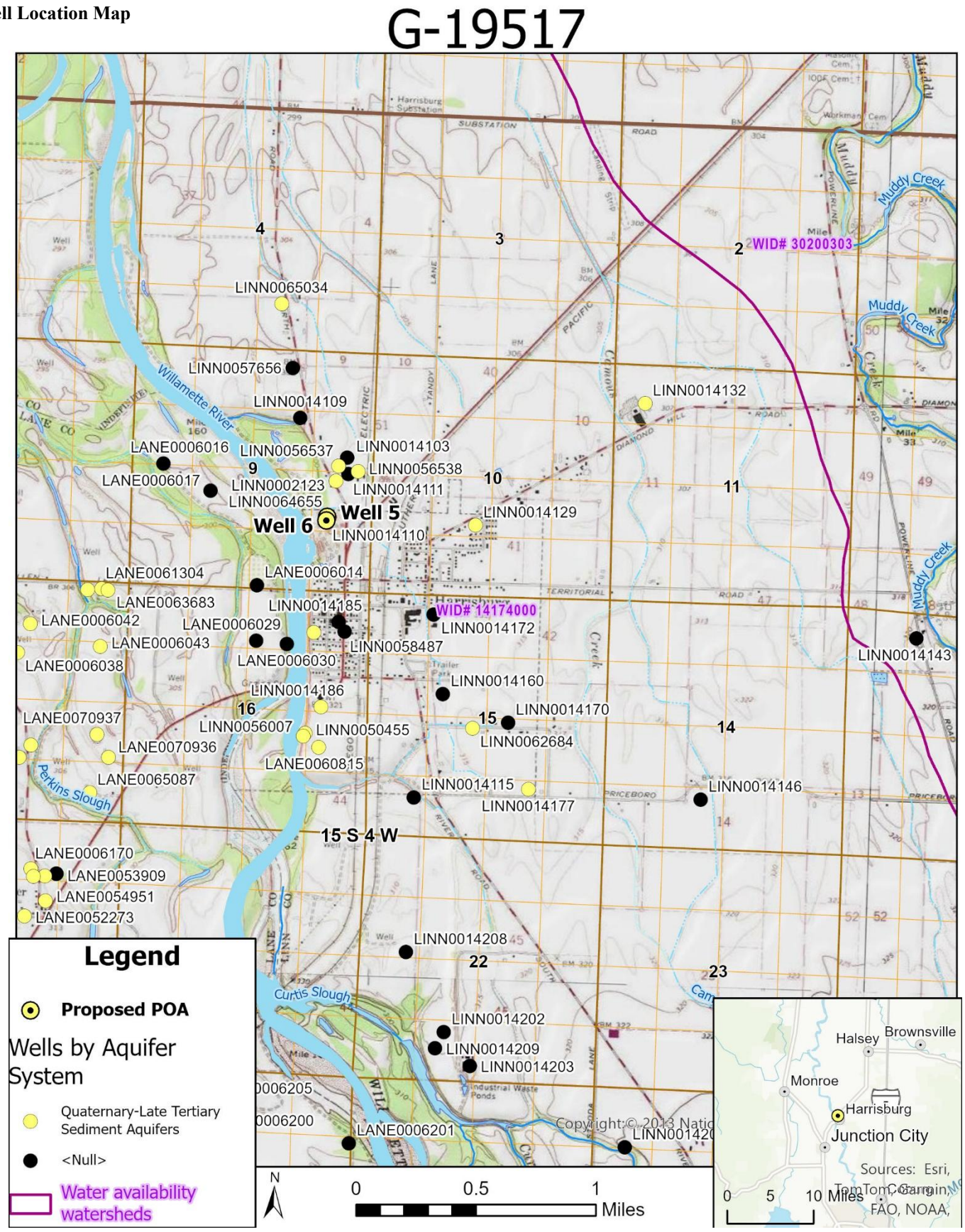
McClaughry, J.D., Wiley, T.J., Ferns, M.L., and Madin, I.P., 2010, Digital geologic map of the southern Willamette Valley, Benton, Lane, Linn, Marion, and Polk Counties, Oregon, Open-File Report O-2010-03, 116 p., 1 pl: Oregon Department of Geology and Mineral Industries, Portland, OR.

O'Connor, J. E., Sarna-Wojcicki, A., Wozniak, K. C., Polette, D. J., Fleck, R. J., 2001, Origin, Extent, and Thickness of Quaternary Units in the Willamette Valley, Oregon, Professional Paper 1620: U. S. Geological Survey, Reston, VA.

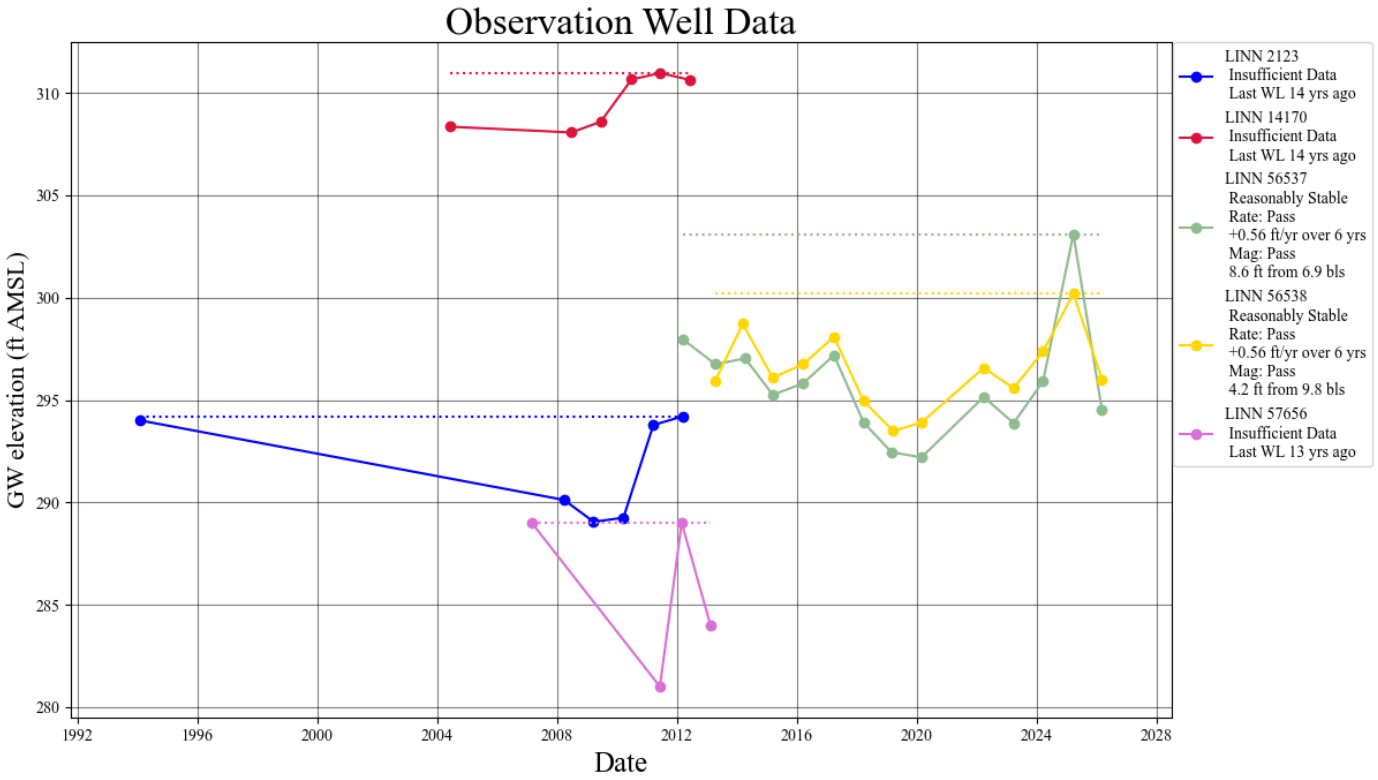
Wei, M., Rathfelder, K., Turner, J., 2016, Determining the Likelihood of Hydraulic Connection – Guidance for the Purpose of Apportioning Demand from Diversion of Groundwater on Streams. Version 1.0. Water Science Series, WSS2016-01. Prov. B.C., Victoria B.C.

ATTACHMENTS:

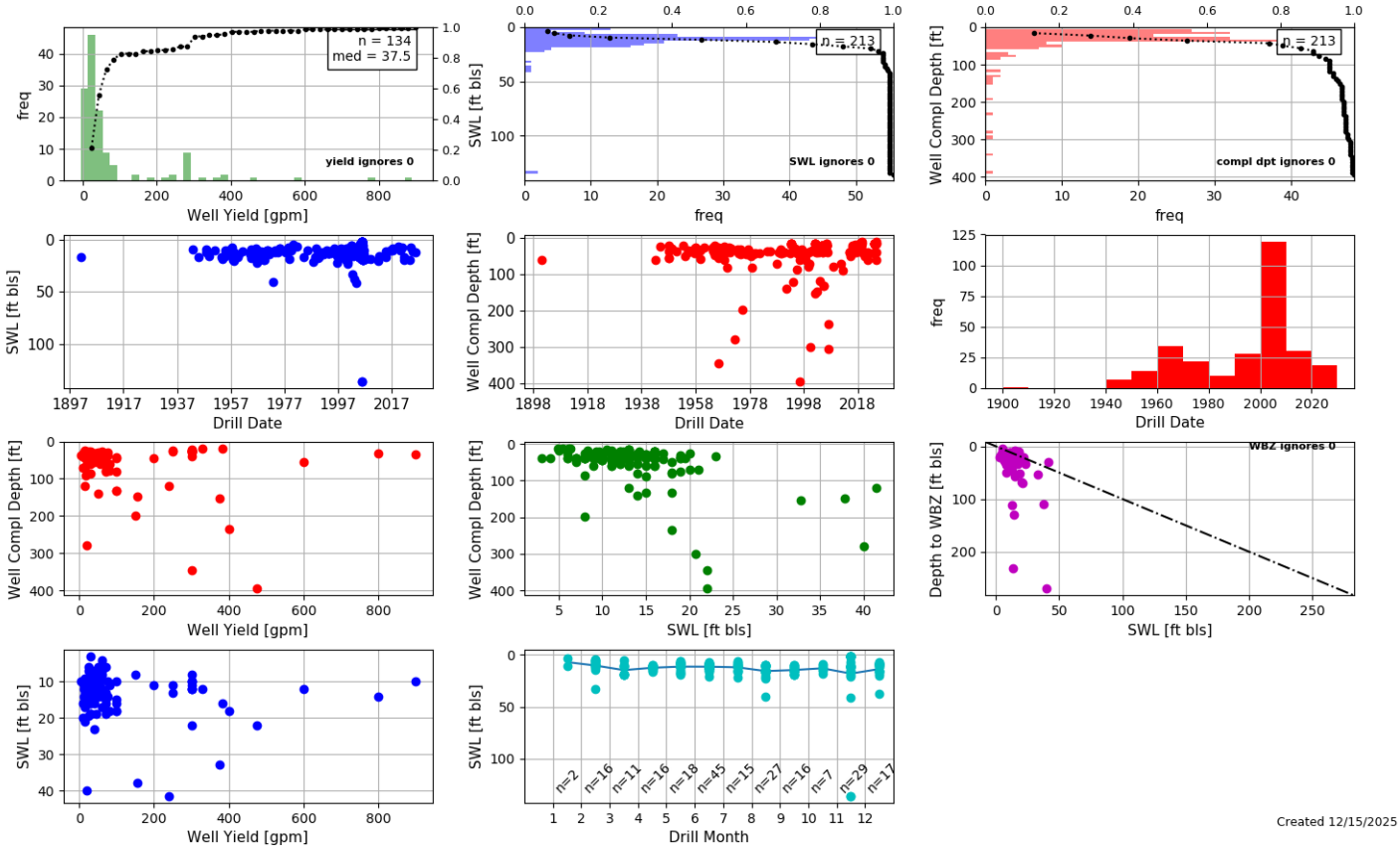
Well Location Map



Water-Level Measurements in Nearby Wells



Water Well Statistics within 1 mile of Proposed POA



Inverse Distance Apportionment (Wei et al., 2016)

Q	0.5	cfs
$f_{Willamette}$	0.998641	[-]
$Qf_{Willamette}$	0.499321	cfs
$d_{Willamette}$	450	ft
$f_{Muddy\ Creek}$	0.001359	[-]
$Qf_{Muddy\ Creek}$	0.000679	cfs
$d_{Muddy\ Creek}$	12200	ft

$$f_i = \frac{\frac{1}{d_i^2}}{\sum i=1,n \frac{1}{d_i^2}}$$

Water Availability Calculation for WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CR AT GAGE 14174

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	10,100.00	1,380.00	8,720.00	0.00	1,750.00	6,970.00
FEB	11,600.00	4,290.00	7,310.00	0.00	1,750.00	5,560.00
MAR	11,000.00	4,560.00	6,440.00	0.00	1,750.00	4,690.00
APR	9,760.00	4,260.00	5,500.00	0.00	1,750.00	3,750.00
MAY	8,430.00	2,560.00	5,870.00	0.00	1,750.00	4,120.00
JUN	5,360.00	856.00	4,500.00	0.00	1,750.00	2,750.00
JUL	3,270.00	667.00	2,600.00	0.00	1,750.00	853.00
AUG	2,560.00	605.00	1,960.00	0.00	1,750.00	205.00
SEP	2,540.00	517.00	2,020.00	0.00	1,750.00	273.00
OCT	2,860.00	269.00	2,590.00	0.00	1,750.00	841.00
NOV	4,170.00	355.00	3,820.00	0.00	1,750.00	2,070.00
DEC	8,150.00	382.00	7,770.00	0.00	1,750.00	6,020.00
ANN	7,460,000.00	1,240,000.00	6,230,000.00	0.00	1,270,000.00	4,960,000.00