Groundwater Application Review Summary Form

Application # G- 19207 re-review #2

GW Reviewer Travis Brown Date Review Completed: 2/12/2025

Summary of GW Availability and Injury Review:

☐ Groundwater for the proposed use is either over appropriated, cannot be determined to be 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 **_2/12/2025_**

TO: **Application** G-**_19207 re-review #2_**

FROM: **GW:** **_Travis Brown_**
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☒ **YES**
☐ **NO**

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

☒ **YES**
☐ **NO**

Use the Scenic Waterway Condition (Condition 7J)

☒ 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 Clackamas 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
0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 2/12/2025
FROM: Groundwater Section Travis Brown
Reviewer's Name
SUBJECT: Application G- **19207 re-review #2** Supersedes review of 11/9/2022
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 Griffin** County: **Clackamas**

A1. Applicant(s) seek(s) 0.0088 cfs from 1 well(s) in the Willamette Basin, Clackamas River subbasin

A2. Proposed use Nursery (6.37 af/yr) 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	CLAC 68594	Well 1	Alluvial	0.0088	**2S/3E-2 NE-SE**	**600'S, 425'W fr E ¼ cor S2 OWRD: 560'S, 460'W fr E1/4 cor S2[a]**

* 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	585.62	4	208	02/16/2012	280	0-34	-2-279	none	none	42	Unknown	Air

Use data from application for proposed wells.

A4. **Comments:** The applicant proposes to withdraw 0.0088 cfs groundwater for nursery use from the existing well (logid CLAC 68594). The well was drilled in 2012 to a depth of 280 ft bls into Quaternary-Late Tertiary sedimentary aquifer of the Troutdale Formation.

[a] There is a discrepancy in the metes and bounds description of the POA location used by the applicant relative to the Department's Public Land Survey System (PLSS) projection and the location as identified on the application map. The mapped location is considered to be the most accurate and will be used in this review. The metes and bounds description of the mapped POA location relative to the Department's PLSS projection is listed in Table A3, above.

A5. ☒ **Provisions of the Willamette** (690-502-0240) 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 well is located within ¼ mile of North Fork Deep Creek. However, the proposed well produces groundwater from a confined aquifer. Per OAR 690-502-0240, the relevant basin rules 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 (Annual groundwater level measurement), medium water use reporting**;

ii. ☐ The permit should be conditioned as indicated in item 2 below.

iii. ☐ The permit should contain special condition(s) as indicated in item 3 below;

B2. a. ☐ **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;

b. ☐ **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;

c. ☒ **Condition** to allow groundwater production only from the **Troutdale Sandstone (Deep Troutdale)** 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 well (CLAC 68594) was drilled to the depth of 280 ft bls and has an open hole from 279 through 280 ft bls. The proposed well would produce groundwater from the alluvial aquifer system. Hydrogeologic mapping by Swanson et al. (1996) indicate that the well is in the Troutdale sandstone (a.k.a. Deep Troutdale) aquifer. The unit mainly consists of slightly to moderately cemented sands and gravels of the Troutdale Formation. Well log shows about 40 ft of water-bearing sands and/or gravels starting at 241 ft bls. Depth and thickness of water bearing zone is consistent with nearby wells CLAC 397 and CLAC 4503 (see attached Well Logs). Wells in the area have generally reported higher yields than the applicant's requested rate of 0.0088 cfc (~4 gpm). The median well yield in the area is 16.5 gpm (see attached Well Statistics). Water level data indicates the Deep Troutdale (sandstone) aquifer discharges to the North Fork of Deep Creek where it has become deeply incised southwest of Boring, OR. Wells et al. (2020) have mapped the sandstone member of the Troutdale Formation as outcropping along the valley walls of the North Fork of Deep Creek. Therefore, the proposed POA is anticipated to have a relatively efficient hydraulic connection with the North Fork of Deep Creek.

Recent groundwater level time series data are limited in the adjacent area of the proposed POA. The state observation well closest to the proposed POA is CLAC 5573 (completed in Deep Troutdale). The attached hydrograph shows seasonal variations in groundwater levels, however relatively stable groundwater levels over the period of last 30 years. CLAC 5444 – completed in the Deep Troutdale (sandstone) – shows an overall decline of ~37 ft in groundwater level over the period of record, although water levels since 2008 have been fairly stable. Measurements within the last decade generally show a more mixed history, with some wells continuing to decline (CLAC 5573, CLAC 53334) while others appear more stable (CLAC 5444) or even show recent recovery (CLAC 857, CLAC 1069). Despite this mixed water level behavior and the lack of current water level data in the Deep Troutdale (sandstone) in the immediate vicinity of the proposed POA, the most recent water levels in the nearest Deep Troutdale wells are generally not declined excessively or excessively declining; therefore,

the groundwater resource is not over appropriated. The close hydraulic connection to the North Fork of Deep Creek should also help moderate groundwater level declines by allowing for surface water capture in lieu of pumping storage.

The nearest well (CLAC 397) to the proposed POA is located about 2100 ft southeast (See attached Well Location Map). Interference with CLAC 397 was quantitatively estimated using a Theis (1935) distance-drawdown model for a boundary condition. Hydraulic parameters used for the analysis were derived from regional data and studies (Pumping Test Reports; Conlon et al., 2005; McFarland and Morgan, 1996). The analysis shows that the pumping at the proposed well may cause minimal (<1 ft) drawdown at the nearest well after 365 days of pumping at the maximum requested rate (see attached Well Interference Analysis). However, several exempt domestic wells are presumed to be closer than CLAC 397 to the proposed POA. Regardless, given the low requested rate (0.0088 cfs), the proposed use of groundwater is not anticipated to cause interference with neighboring wells sufficient to meet the definition of injury.

The conditions specified in Item B1(d) and B2(c), above, are recommended for any permit issued pursuant to this application.

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	**Troutdale Sandstone (Deep Troutdale)**	☒	☐

Basis for aquifer confinement evaluation: Reported SWLs in the proposed well and nearby wells CLAC 397 and CLAC 4503 are above the relevant water-bearing zones. Well logs also show low permeable clay layer overlying the water-bearing zones.

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? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**North Fork Deep Creek**	**378**	**~303-477[a]**	**~1250**	☒	☐	☐	☐	☒
1	**2**	**Noyer Creek**	**378**	**~424-572[a]**	**~4150**	☐	☒	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: Measured groundwater elevation at the proposed well is above or coincident with surface water elevations at the south-southwest section of the North Fork Deep Creek. Surface water elevations at Noyer Creek are above the groundwater elevation at the well.

[a]Estimated from LIDAR, within 1 mile of proposed POA (Watershed Sciences, 2009)

Water Availability Basin the well(s) are located within: WID # 137 N FK DEEP CR >DEEP CR – 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 (SW) source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that SW source, 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**	☒	☐	**MF137**	**1**	☐	**0.88**	☐	**<25%**	☒

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?
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: The proposed POA (Well 1/ CLAC 68594) is less than ¼ mile from the nearest hydraulically connected surface water source (SW 1/North Fork Deep Creek). Per OAR 690-009-0040(4)(a), the potential for Substantial Interference (PSI) is assumed. SW 1 (North Fork Deep Creek) is above and tributary to the Clackamas River State Scenic Waterway (ORS 390.826(3)).

The anticipated interference with SW 1 due to the proposed use was quantitatively estimated using the Hunt (2003) model. Hydraulic parameters used for the analysis were derived from regional data and studies (Pumping Test Reports; Conlon et al., 2005; McFarland and Morgan, 1996) or are within a typical range of values for the given parameter within the hydrogeologic regime (Freeze and Cherry, 1979). Results indicate that interference with SW 1 is not anticipated to exceed 25 percent of the rate of withdrawal within the first 30 days of continuous pumping.

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													
(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:

i. ☒ The permit should contain condition #(s) **7j (Scenic Waterway condition)**

ii. ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:** The applicant's well accesses an aquifer that is found to be hydraulically connected to North Fork Deep Creek. Because the well is hydraulically connected within ¼ mile of the Creek, the proposed use is assumed to have the Potential for Substantial Interference (PSI) as per OAR 690-009-0040(4)(a).

The proposed POA is hydraulically connected to SW 1 (North Fork Deep Creek), which is above and tributary to the Clackamas River State Scenic Waterway (ORS 390.826(3)). Any permit issued pursuant to this application should contain the State Scenic Waterway condition (7j). Although stream depletions due to the proposed use will be small initially, they will increase with time until a new steady-state is reached between recharge (including stream capture) and discharge, at which time approximately 100-percent of the water consumed from the proposed POA will be depleted from surface water (Theis, 1940; Bredehoeft, 2011; Barlow and Leake, 2012). Therefore, the monthly interference with surface water above the State Scenic Waterway is estimated as 1/12 of the full volume of consumptive use, assuming that at steady-state the depletion of surface water will be distributed approximately evenly throughout the year. For nursery and irrigation use, this approach is expected to overestimate stream depletion during the cool, high-precipitation months (when groundwater demand is anticipated to be lowest) and underestimate stream depletion during the hot, dry summer months (when groundwater demand is anticipated to be highest). This bias will be greatest for wells that are closest to streams and will lessen the further a well is located from a stream (Bredehoeft, 2011; Barlow and Leake, 2012).

References Used:

Application File: G-19207

Barlow, P., and Leake, J., 2012, Streamflow depletion by wells – understanding and managing the effects of groundwater pumping on streamflow: U.S. Geological Survey, Circular 1376, 84 p.

Bredehoeft, J., 2011, Hydrologic trade-offs in conjunctive use management: Ground Water, v. 49, no. 4, p 468-475.

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, 83 p.

Freeze, R.A. and Cherry, J.A., 1979, Groundwater, Prentice Hall, Englewood Cliffs, New Jersey, 604 p.

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.

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, Vol 8, p. 12-19.

McFarland, W.D., and Morgan, D.S., 1996, Description of the Ground-Water Flow System in the Portland Basin, Oregon and Washington, Water Supply Paper 2470-A, 58 p: U. S. Geological Survey, Reston, VA.

Pumping Test Report: CLAC 871, CLAC 50556, CLAC 791, CLAC 1069, CLAC 55914, CLAC 51454.

Swanson, R. D., McFarland, W. D., Gonthier, J. B., and Wilkinson, J. M., 1993, A description of hydrogeologic units in the Portland Basin, Oregon and Washington, Water-Resources Investigations Report 90-4196, 56 p.: U. S. Geological Survey, Reston, VA.

Theis, C.V., 1935, The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage, American Geophysical Union Transactions, vol. 16, p. 519-524.

Theis, C.V., 1940, The source of water derived from wells: Essential factors controlling the response of an aquifer to development: Civil Eng., Vol. 10: pp. 277–280.

Watershed Sciences, 2009, LIDAR remote sensing data collection, Department of Geology and Mineral Industries, Hood to Coast, Oregon: Portland, OR, May 27.

Wells, R., Haugerud, R.A., Niem, A.R., Niem, W.A., Ma, L., Evarts, R.C., O'Connor, J.E., Madin, I.P., Sherrod, D.R., Beeson, M.H., Tolan, T.L., Wheeler, K.L., Hanson, W.B., and Sawlan, M.G., 2020, Geologic map of the greater Portland metropolitan area and surrounding region, Oregon and Washington: U.S. Geological Survey Scientific Investigations Map 3443, pamphlet 55 p., 2 sheets, scale 1:63,360.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #**: **1** **Logid:** CLAC 68594

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

a. ☐ review of the well log;

b. ☐ field inspection by _____;

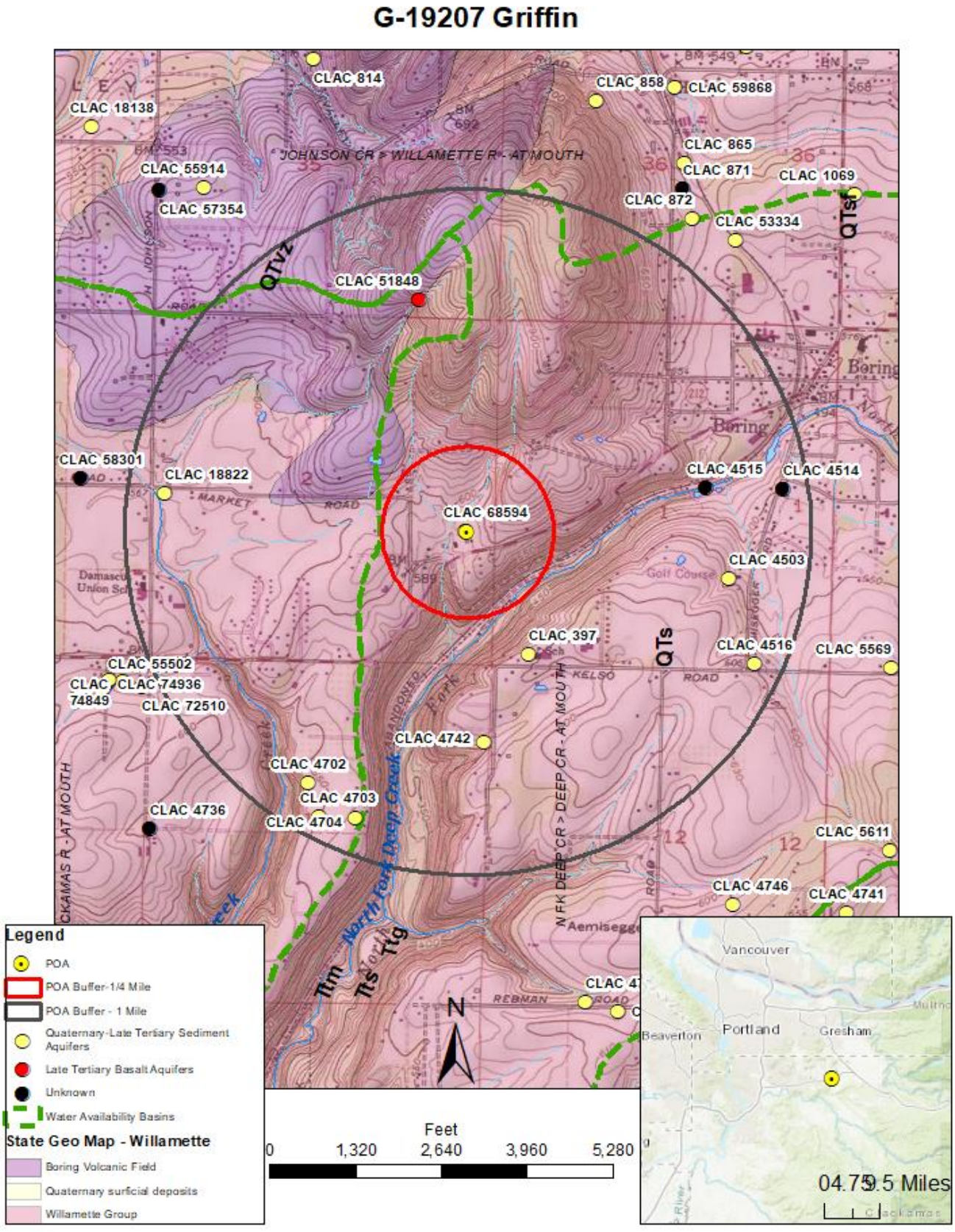
c. ☐ report of CWRE _____;

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



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
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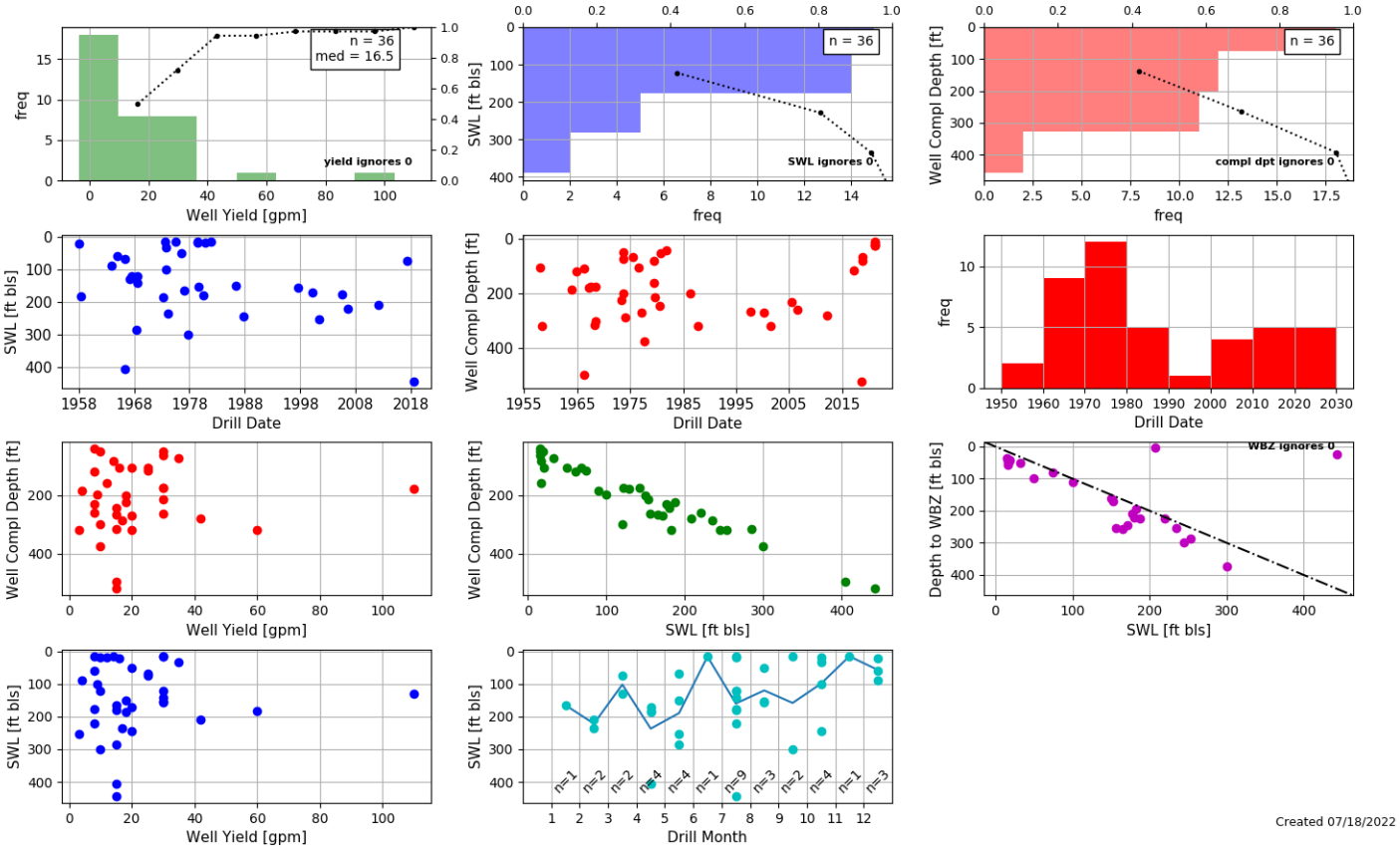
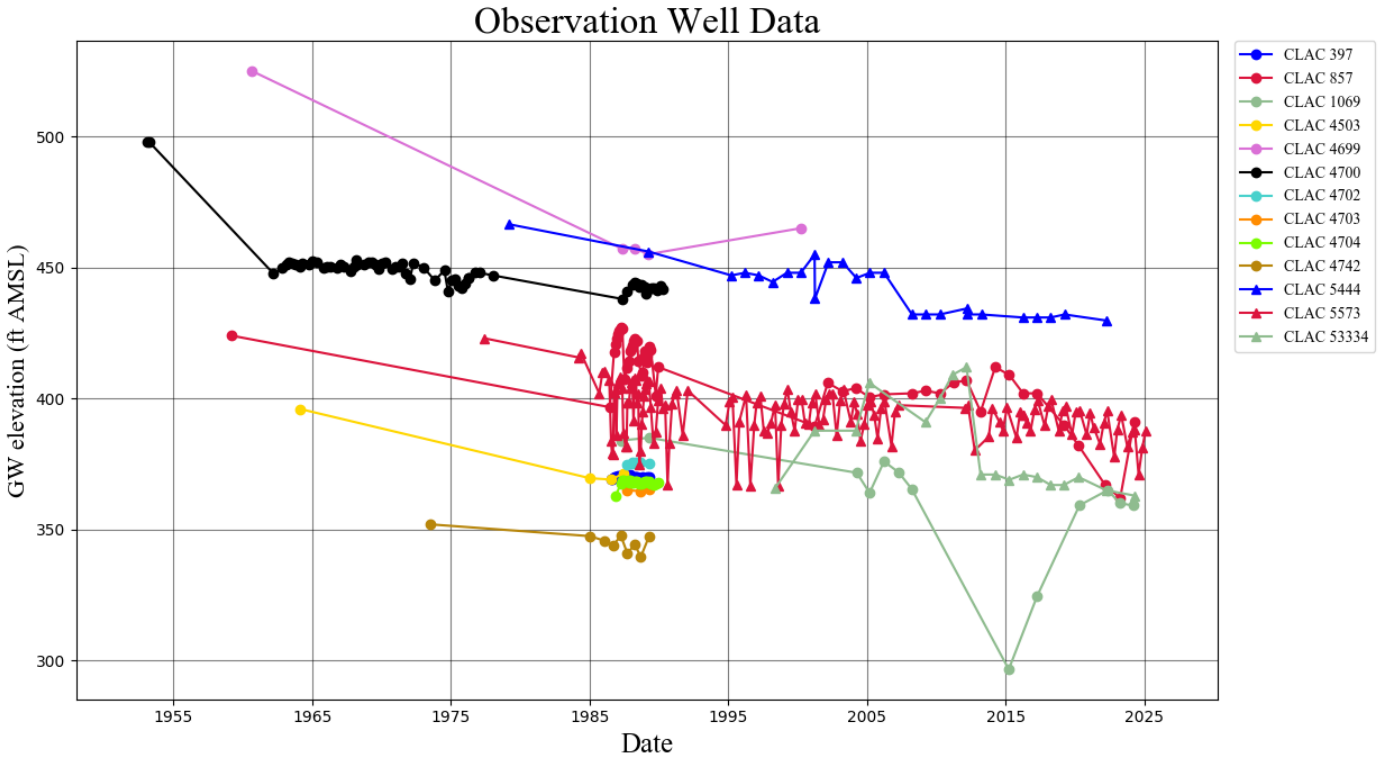
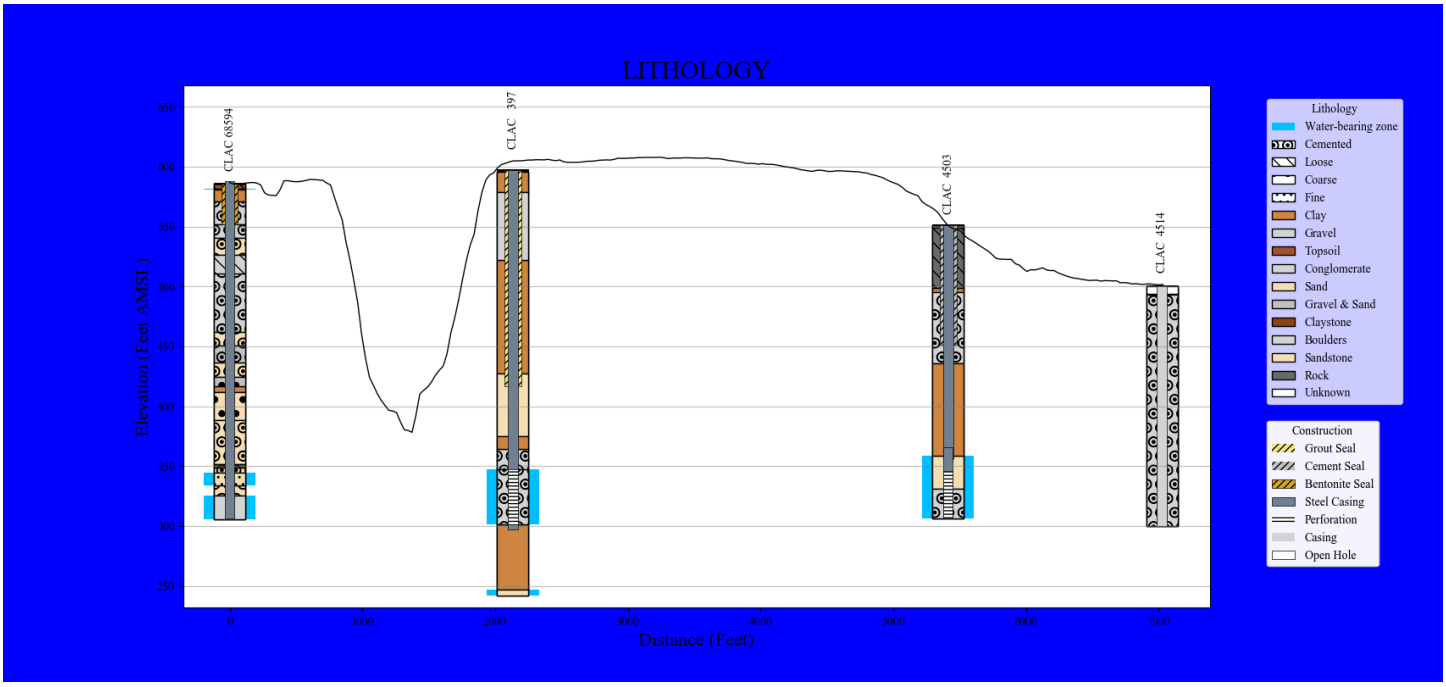
Well Statistics



Water-Level Measurements in Nearby Wells



Well Logs



Water Availability Table

Water Availability Analysis
Detailed Reports

N FK DEEP CR > DEEP CR - AT MOUTH
WILLAMETTE BASIN
Water Availability as of 8/16/2022

Watershed ID #: 137 (Map)
Date: 8/16/2022

Exceedance Level: 80%
Time: 2:05 PM

Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations | Water Rights | Watershed Characteristics

Water Availability Calculation

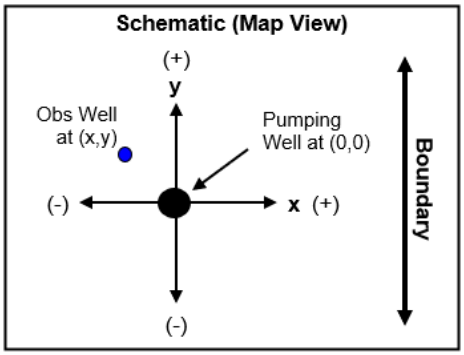
Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	27.60	1.33	26.30	0.00	20.00	6.27
FEB	28.60	1.12	27.50	0.00	20.00	7.48
MAR	28.00	0.53	27.50	0.00	20.00	7.47
APR	25.20	0.55	24.70	0.00	20.00	4.65
MAY	18.60	0.83	17.80	0.00	20.00	-2.23
JUN	8.89	1.15	7.74	0.00	3.00	4.74
JUL	3.67	1.77	1.90	0.00	3.00	-1.10
AUG	1.32	1.47	-0.15	0.00	1.00	-1.15
SEP	0.88	0.70	0.18	0.00	1.00	-0.82
OCT	1.12	0.35	0.77	0.00	1.00	-0.23
NOV	4.39	0.48	3.92	0.00	20.00	-16.10
DEC	21.80	1.47	20.30	0.00	20.00	0.33
ANN	22,100.00	710.00	21,400.00	0.00	8,970.00	12,500.00

Well Interference Analysis

Theis Time Drawdown with Boundary Worksheet

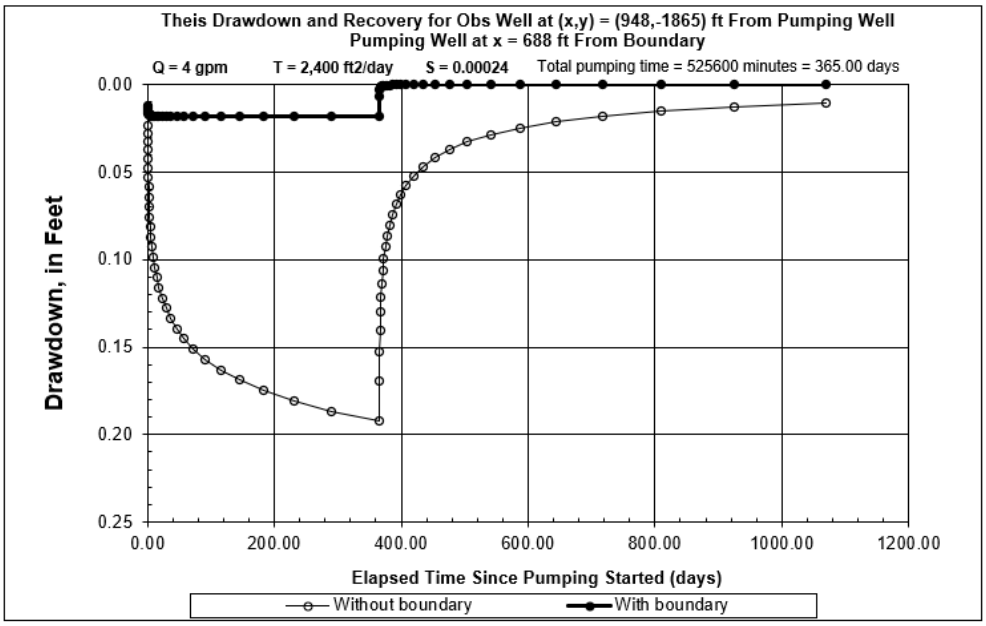
Written by Karl C. Wozniak (OWRD) November 1999
References: Theis (1935), Lohman (1972)
See bottom of worksheet for detailed references and model assumptions.



Calculates Theis nonequilibrium drawdown and recovery versus time at any specified observation well location.
Allows for one recharge or barrier boundary.
Pumping well is at (0,0)
Observation well is at user specified (x,y)
Boundary is at user specified distance from pumping well.

Input Data:

Boundary type (Recharge, Barrier, None)	**Recharge**	
x coordinate for boundary (ft), a	**688**	**[ft]**
x coordinate for observation well (ft)	**948**	Use -1 for drawdown at pumping well
y coordinate for observation well	**-1,865**	Use 0 for drawdown at pumping well
Net Steady Pumping Rate, Q	**4**	**[gpm]**
Total Pumping Time), t	**365.0000**	**d**
Transmissivity of Aquifer, T	**2,400**	**ft2pd**
Storativity of Aquifer, S	**0.00024**	



Stream Depletion Analysis

Application type:	G
Application number:	19207
Well number:	1
Stream Number:	1
Pumping rate (cfs):	0.0088
Pumping duration (days):	365.0
Pumping start month number (3=March)	1.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	1250.0	1250.0	1250.0	ft
Aquifer transmissivity	T	300.0	1050.0	2400.0	ft2/day
Aquifer storativity	S	0.0008	0.0002	8e-5	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.04	0.1	ft/day
Aquitard saturated thickness	ba	30.0	30.0	30.0	ft
Aquitard thickness below stream	babs	30.0	30.0	30.0	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-
Stream width	ws	20.0	20.0	20.0	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	330	360
Depletion (%)	0	0	0	0	1	1	1	1	1	1	1	1	1
Depletion (cfs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00