Groundwater Application Review Summary Form

Application # G- 19326

GW Reviewer Phillip I. Marcy/Stacey Garrison Date Review Completed: 08/07/2025

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 7, 2025_**

TO: **Application** G-**_19326_**

FROM: **GW:** **_Phillip I. Marcy/Stacey Garrison_**
(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 _[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

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 08/07/2025
FROM: Groundwater Section Phillip I. Marcy/Stacey Garrison
Reviewer's Name
SUBJECT: Application G- **19326** Supersedes review of 7/5/2023
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: **Ivo Franz Wenz** County: **Linn**

A1. Applicant(s) seek(s) 4.25 cfs from 4 well(s) in the Willamette Basin, Santiam-Calapooia subbasin

A2. Proposed use Irrigation (340.1 acres) Seasonality: April 1st – September 30th (213 days)[a]

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	LINN 4404	1	Alluvium	3.58[b]	10S/2W-34 SW-NW	440'S, 1510'W fr NW cor DLC 60
2	PROP 336	2	Alluvium	3.11	10S/2W-33 SE-SE	250'N, 980'W fr SE cor S 33
3	PROP 337	3	Alluvium	0.49	11S/2W-3 SW-NE	1290'S, 2210'W fr NE cor S 3
4	PROP 338	4	Alluvium	0.65	11S/2W-2 SW-NW	1980'S, 950'E fr NW cor S 2

* 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	261	23	6	02/29/1984	130	0-23	+1-129.67	None	118-128	315	23.5	Pump
2	261	NA	NA	NA	~135	0-18+	Unknown	Unknown	Unknown	NA	NA	NA
3	269	NA	NA	NA	~60	0-18+	Unknown	Unknown	Unknown	NA	NA	NA
4	274	NA	NA	NA	~50	0-18+	Unknown	Unknown	Unknown	NA	NA	NA

Use data from application for proposed wells.

A4. **Comments:** The applicant proposes to develop groundwater from one existing well and three wells yet to be constructed. Wells 1 and 2 are proposed to share portions of the maximum rate with each possibly pumping up to 3.11 cfs, while a dedicated rate is proposed for each Well 3 (0.49 cfs) and Well 4 (0.65 cfs). All proposed POAs are to develop from alluvium.
[a] The applicant has requested to irrigate for less than the maximum allowed time period for irrigation (April 1 through September 30 instead of March 1 through October 31). The analysis for this review utilizes this reduced period of time (April 1 through September 30).
[b] Well 1 is also a POA on Certificate 60735 for the irrigation of 37.7 ac at a maximum rate of 0.47 cfs and a maximum annual duty of 94.25 AF. This review considers the combined rate and annual duty for Well 1: 3.58 cfs (1606.8 gpm) and 716.75 AF.

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 POAs develop a confined aquifer, therefore the basin rules are not activated.

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; "Large Water Use Reporting"**;

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

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

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

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

c. ☒ **Condition** to allow groundwater production only from the **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:** Most wells within the area of the proposed POA wells produce from unconsolidated sediments, here divided into those above and below the Willamette Silt into "Older Alluvium" and "Younger Alluvium" (Frank, 1976). Older deposits reported in some deeper wells in the area include Little Butte Volcanics and marine siltstone, shale, and tuffaceous sandstone. Both POA wells are likely to produce from Older Alluvium, noted for sand and gravel mixtures with subordinate silt and clay. This poor sorting, in addition to the lenticular geometry of more conductive deposits limits the bulk transmissivity from this aquifer, despite the presence of gravels.

A review of statistics for nearby well records was completed and compared with the proposed rates for this application (see Well Statistics). **The proposed rates of use for Well 1 (LINN 4404) of 3.58 cfs (1,606.8 gpm) and Well 2 (PROP 336) of 3.11 cfs (1,395.9 gpm) are not likely within the capacity of the groundwater resource**; median reported well yield is 35 gpm, and the maximum reported yield is 800 gpm, however, of the 201 well yields evaluated, only 21 reported yields greater than 100 gpm. The proposed rates for Well 3 (PROP 337) and Well 4 (PROP 338) are 0.49 cfs (220 gpm) and 0.65 cfs (291.7 gpm), respectively, and are likely within the capacity of the resource.

LINN 4394 is 850' from proposed POA 2 and also produces from alluvium under Groundwater Claim 897. Data from nearby pump tests submitted to the department report values for transmissivity of 4,900-45,000 ft^2/day in the sand and gravel aquifer here, with median values falling near 7,600 ft^2/day. This parameter can vary greatly with uneven distribution of coarse-grained sediments within the alluvial sequence with highly variable effective aquifer thicknesses. Using the most likely range of input parameters, a time-drawdown calculation anticipates drawdown experienced at LINN 4394 to range from less than 10' to greater than 37' after 213 days of continuous pumping at the proposed rate at proposed POA 2.

Available water level data indicate year over year stability (see attached hydrograph). The groundwater resource does not appear to be over-appropriated.

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	**Sand and Gravel**	☒	☐
2	**Sand and Gravel**	☒	☐
3	**Sand and Gravel**	☒	☐
4	**Sand and Gravel**	☒	☐

Basis for aquifer confinement evaluation: Well logs in the area report static water level rising well above the level at which groundwater was first encountered during well construction.

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**	**South Santiam River**	**255**	**241-261**	**3050**	☒	☐	☐	☐	☒
2	**1**	**South Santiam River**	**~250**	**241-261**	**1985**	☒	☐	☐	☐	☒
3	**1**	**South Santiam River**	**~260**	**241-261**	**4350**	☒	☐	☐	☐	☒
4	**1**	**South Santiam River**	**~265**	**241-261**	**6380**	☒	☐	☐	☐	☒
1	**2**	**Crabtree Creek**	**255**	**244-287**	**2640**	☒	☐	☐	☐	☒
2	**2**	**Crabtree Creek**	**~250**	**244-287**	**5600**	☒	☐	☐	☐	☒
3	**2**	**Crabtree Creek**	**~260**	**244-287**	**3390**	☒	☐	☐	☐	☒
4	**2**	**Crabtree Creek**	**~265**	**244-287**	**2080**	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: Discharge to local surface water is part of the same regional discharge that supplies groundwater to wells in the alluvial aquifer.

Water Availability Basin the well(s) are located within: **S SANTIAM R> SANTIAM R- AT MOUTH; CRABTREE CR> S SANTIAM 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 (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**	☐	☐	**NA**	**NA**	☐	**253.0**	☒	**<<25%**	☒
2	**1**	☐	☐	**NA**	**NA**	☐	**253.0**	☒	**<<25%**	☒
3	**1**	☐	☐	**NA**	**NA**	☐	**253.0**	☐	**<<25%**	☐
1	**2**	☐	☐	**MF88A**	**25.0**	☒	**37.3**	☒	**<<25%**	☒
3	**2**	☐	☐	**MF88A**	**25.0**	☒	**37.3**	☒	**<<25%**	☒
4	**2**	☐	☐	**MF88A**	**25.0**	☒	**37.3**	☒	**<<25%**	☒

Comments: **The proposed rate for POAs 1 and 2 is greater than one percent (2.53 cfs) of the 80 percent Natural Flow (253 cfs) for SW 1 (South Santiam River). The proposed rate for POAs 1, 3, and 4 is greater than one percent (0.373 cfs) of the 80 percent Natural Flow (37.3) for SW 2 (Crabtree Creek) and the one percent (0.25 cfs) of the Instream Water Right (25.0 cfs) for SW 2 (Crabtree Creek).** Due to considerable distances and the presence of fine-grained lithologies above

the respective water-bearing zones within each well, interference at 30 days is anticipated to be much less than 25% of the volume pumped at each proposed POA well.

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		☐			☐	**253.0**	☒	**<<25%**	☒
	2		☐	**MF88A**	**25.0**	☒	**37.3**	☒	**<<25%**	☒

Comments: **The total proposed rate of 4.25 cfs (1,907.5 gpm) exceeds one percent (2.53 cfs) of the 80 percent Natural Flow (253 cfs) for SW 1 (South Santiam River), the one percent (0.373 cfs) of the 80 percent Natural Flow (37.3 cfs) for SW 2 (Crabtree Creek), and the one percent (0.25 cfs) of the Instream Water Right (25.0 cfs) for SW 2 (Crabtree Creek). The applicant may revise the proposed total maximum rate to less than 0.25 cfs (112 gpm) to avoid triggering PSI on this basis.** Due to considerable distances and the presence of fine-grained lithologies above the respective water-bearing zones within each well, interference at 30 days is anticipated to be much less than 25% of the volume pumped.

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: N/A-streams within one mile evaluated above.

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:** Potential to Substantially Interfere (PSI) has been tripped for all proposed POA well locations. Rates and/or proposed locations may be amended for reconsideration of this finding considering the conditions listed above (in C3b): **revise the proposed total maximum rate to less than 0.25 cfs (112 gpm) to avoid triggering PSI (this will also address the Capacity of Resource finding in Section B).**

References Used:

Gannet, M. W. and R. R. Caldwell. 1998. *Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington.* USGS Professional Paper 1424-A.

Woodward, D. G., M. W. Gannett, and J. J. Vaccaro. 1998. *Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington*. USGS Professional Paper 1424-B.

Frank, F.J., 1976. *Ground Water in the Harrisburg-Halsey Area, Southern Willamette Valley, Oregon.* USGS Water Supply Paper 2040.

Theis, C.V., 1941, *The effect of a well on the flow of a nearby stream:* Am. Geophys. Union Trans., v. 22, pt.3, p. 734-738.

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

S SANTIAM R > SANTIAM R - AT MOUTH

Watershed ID #: 30200601 Basin: WILLAMETTE Exceedance Level: 80

Time: 1:04 PM Date: 07/05/2023

Monthly values are in cfs.

Storage is the annual amount at 50% exceedance in ac-ft.

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
JAN	3,090.00	266.00	2,820.00	0.00	0.00	2,820.00
FEB	3,360.00	1,530.00	1,830.00	0.00	0.00	1,830.00
MAR	3,170.00	1,260.00	1,910.00	0.00	0.00	1,910.00
APR	2,950.00	1,050.00	1,900.00	0.00	0.00	1,900.00
MAY	2,050.00	711.00	1,340.00	0.00	0.00	1,340.00
JUN	968.00	182.00	786.00	0.00	0.00	786.00
JUL	450.00	205.00	245.00	0.00	0.00	245.00
AUG	275.00	189.00	85.60	0.00	0.00	85.60
SEP	253.00	159.00	94.10	0.00	0.00	94.10
OCT	363.00	138.00	225.00	0.00	0.00	225.00
NOV	1,450.00	140.00	1,310.00	0.00	0.00	1,310.00
DEC	3,040.00	143.00	2,900.00	0.00	0.00	2,900.00
ANN	2,330,000	355,000	1,980,000	0	0	1,980,000

CRABTREE CR > S SANTIAM R - AT MOUTH

Watershed ID #: 88 Basin: WILLAMETTE Exceedance Level: 80

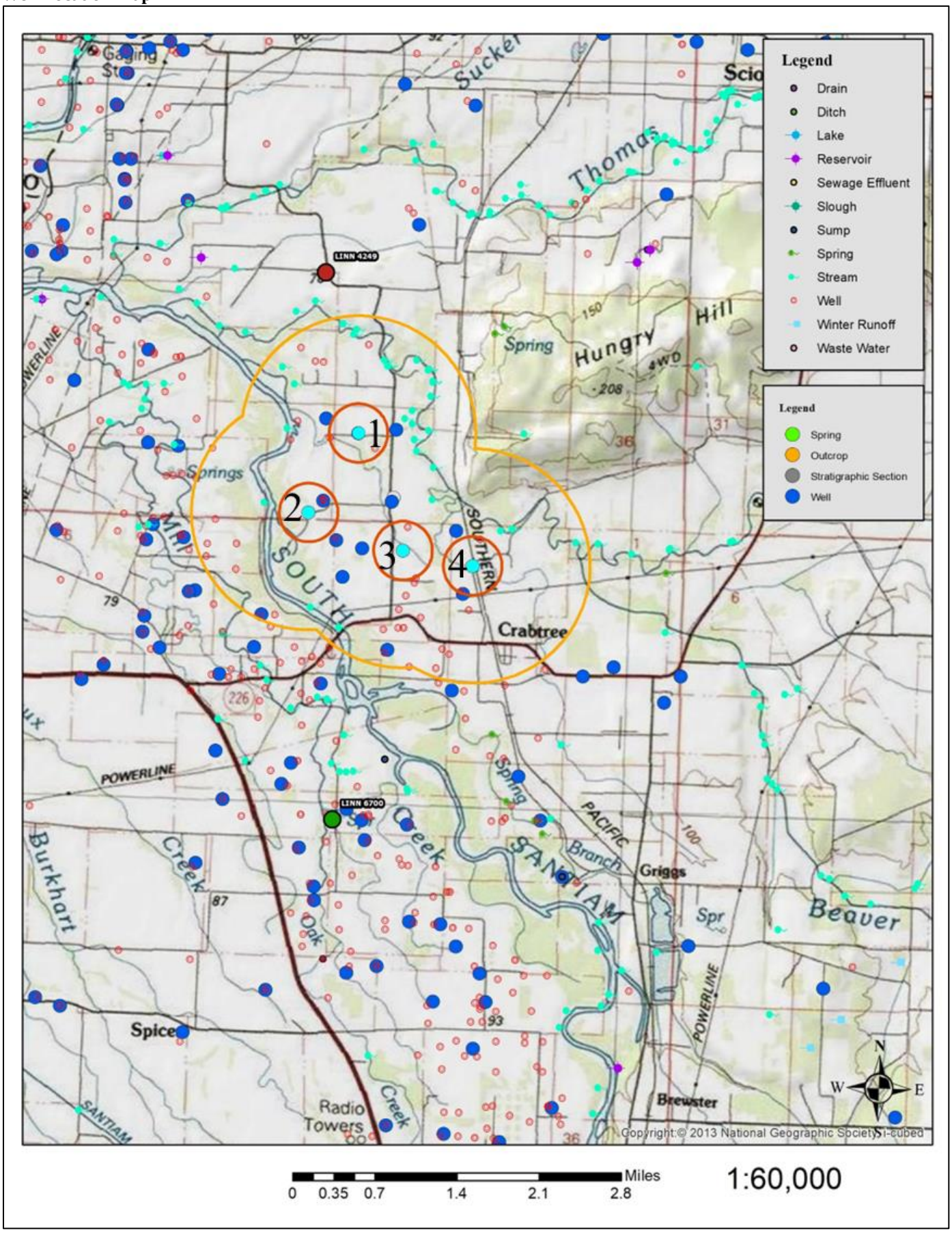
Time: 1:03 PM Date: 07/05/2023

Monthly values are in cfs.

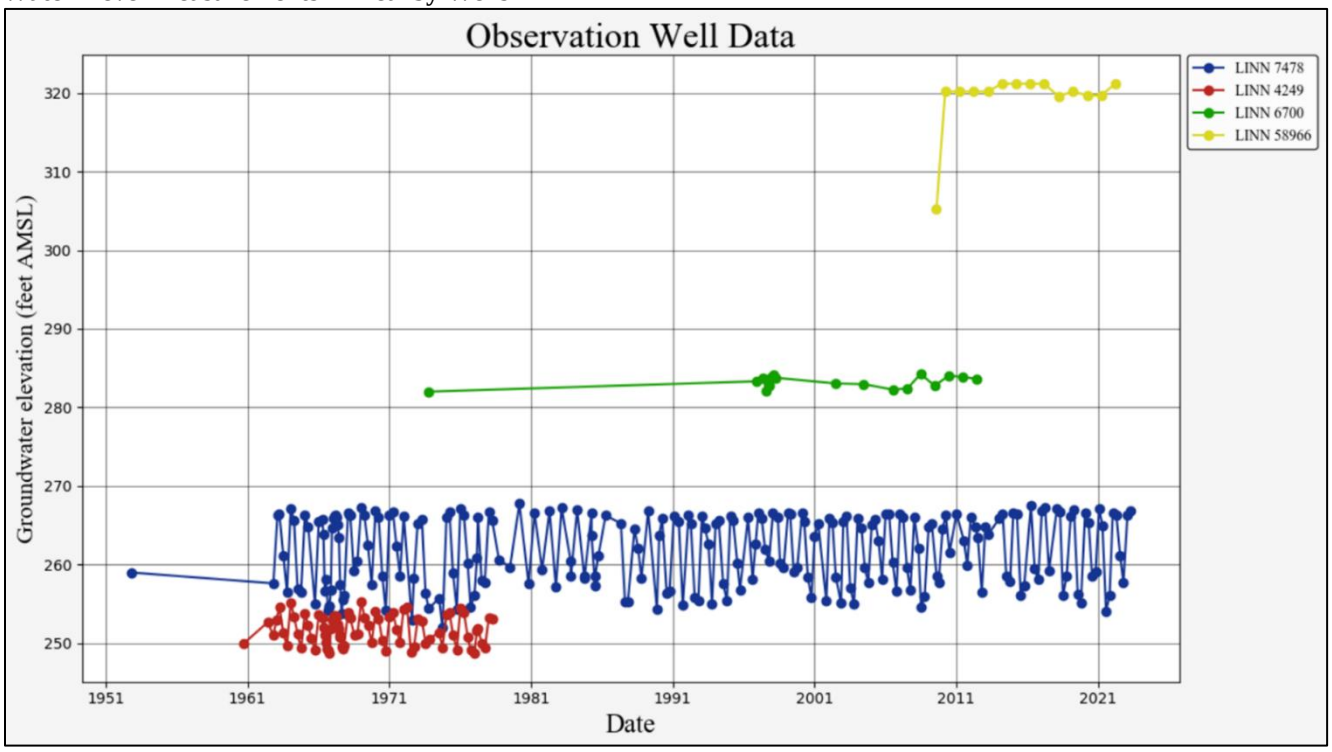
Storage is the annual amount at 50% exceedance in ac-ft.

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
JAN	468.00	2.17	466.00	0.00	100.00	366.00
FEB	467.00	2.14	465.00	0.00	100.00	365.00
MAR	449.00	1.78	447.00	0.00	100.00	347.00
APR	380.00	2.48	378.00	0.00	100.00	278.00
MAY	221.00	8.14	213.00	0.00	100.00	113.00
JUN	123.00	16.10	107.00	0.00	50.00	56.90
JUL	55.00	28.00	27.00	0.00	35.00	-7.98
AUG	37.30	22.30	15.00	0.00	25.00	-9.97
SEP	38.80	11.00	27.80	0.00	100.00	-72.20
OCT	59.10	1.05	58.00	0.00	100.00	-42.00
NOV	214.00	1.35	213.00	0.00	100.00	113.00
DEC	421.00	2.20	419.00	0.00	100.00	319.00
ANN	310,000	6,000	304,000	0	60,900	246,000

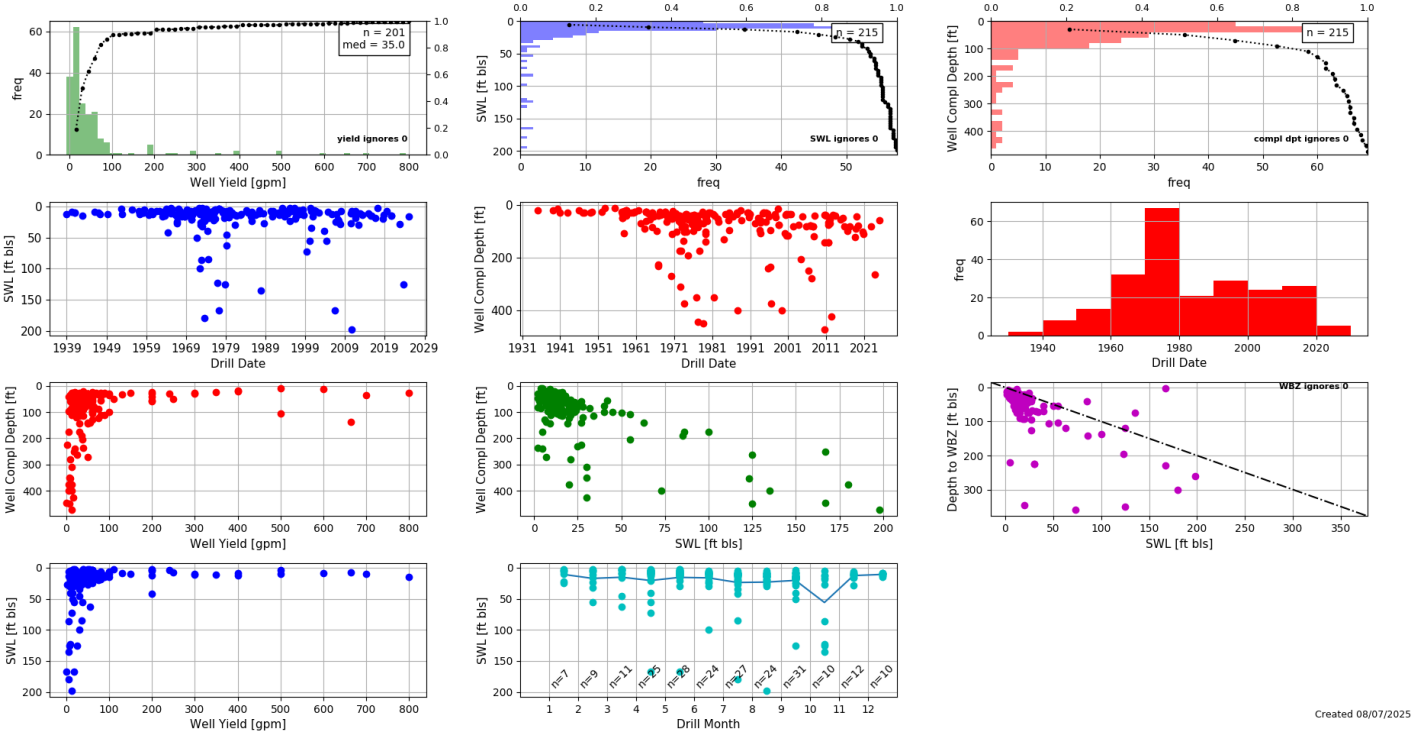
Well Location Map



Water-Level Measurements in Nearby Wells

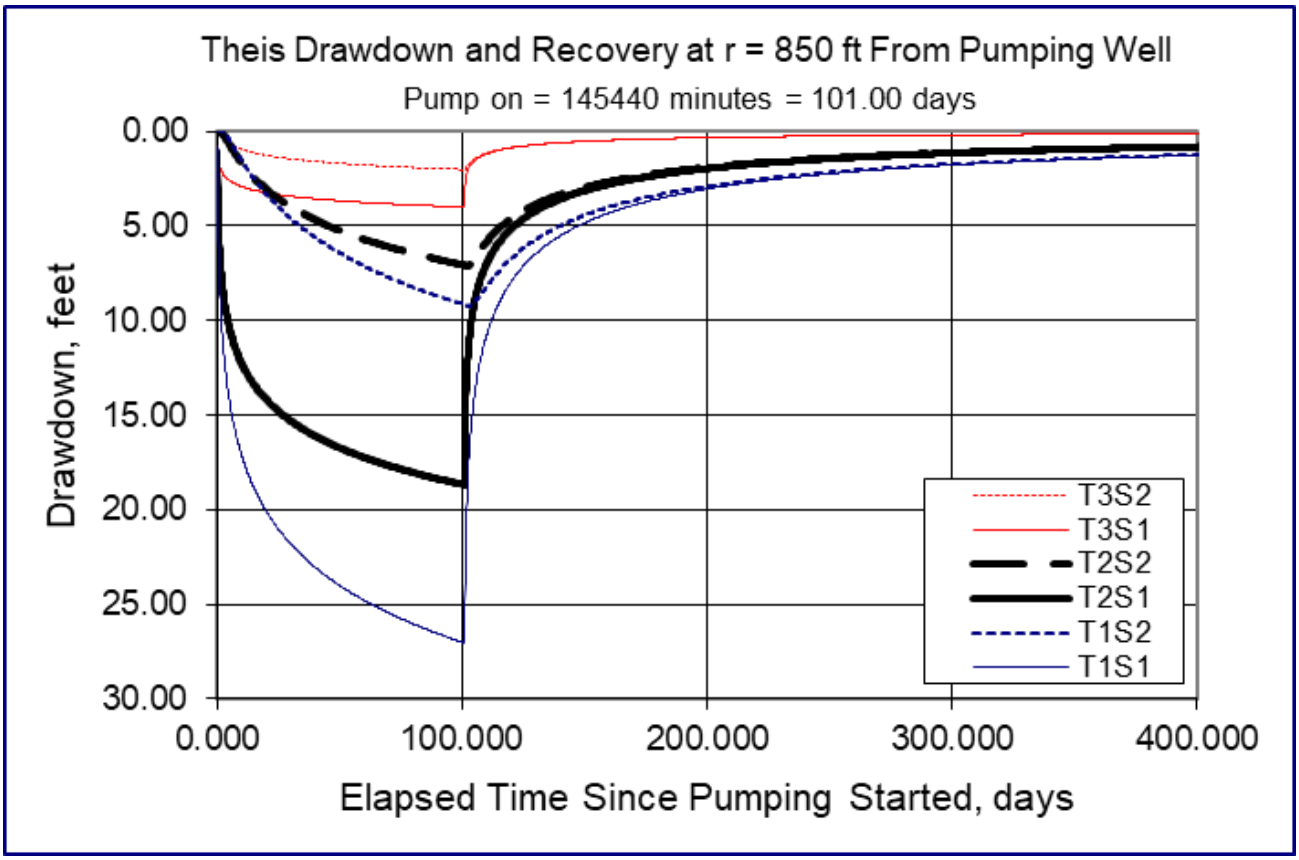


Well Statistics



Theis Interference Analysis

Input Data:	Var Name	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Units**	
Total pumping time	t		**101**		d	
Radial distance from pumped well:	r		**850**		ft	**Q conversions**
Pumping rate	Q		**3.1**		cfs	1,391.28 gpm
Hydraulic conductivity	K	**82**	**127**	**750**	ft/day	3.10 cfs
Aquifer thickness	b		**60**		ft	186.00 cfm
Storativity	S_1		**0.003**			267,840.00 cfd
	S_2		**0.2**			6.15 af/d
Transmissivity Conversions	T_f2pd	4920	7620	45000	ft2/day	
	T_ft2pm	3.41666667	5.29166667	31.25	ft2/min	**Recalculate**
	T_gpdpft	36801.6	56997.6	336600	gpd/ft	



Stream Depletion Analysis

Application type:	G
Application number:	19326
Well number:	2
Stream Number:	1
Pumping rate (cfs):	3.11
Pumping duration (days):	213.0
Pumping start month number (3=March)	4.0
Plotting duration (days)	365

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	1985.0	1985.0	1985.0	ft
Aquifer transmissivity	T	4920.0	7620.0	45000.0	ft2/day
Aquifer storativity	S	0.003	0.1015	0.2	-
Aquitard vertical hydraulic conductivity	Kva	0.05	0.05	0.05	ft/day
Aquitard saturated thickness	ba	50.0	50.0	50.0	ft
Aquitard thickness below stream	babs	3.0	3.0	3.0	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-
Stream width	ws	100.0	100.0	100.0	ft

Stream depletion for Scenario 2:

Days	10	300	330	360	30	60	90	120	150	180	210	240	270
Depletion (%)	1	8	7	6	3	6	9	10	11	13	14	12	9
Depletion (cfs)	0.02	0.24	0.22	0.20	0.10	0.20	0.27	0.32	0.36	0.39	0.42	0.36	0.28