Groundwater Application Review Summary Form

Application # G- 19220

GW Reviewer Stacey Garrison/Travis Brown Date Review Completed: 11/7/2023

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 **_November 7 2023_**

TO: **Application** G-**_19220_**

FROM: **GW:** **_Stacey Garrison/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 _[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 10/30/2023
FROM: Groundwater Section Stacey Garrison/Travis Brown
Reviewer's Name
SUBJECT: Application G- **19220** Supersedes review of
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: **Craig and Juanita Schurter** County: **Marion**

A1. Applicant(s) seek(s) 0.41 cfs from 2 well(s) in the Willamette Basin, Molalla-Pudding subbasin

A2. Proposed use Irrigation (32.7 ac / 81.75 af/yr) Seasonality: March 1 – October 31

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	PROP 259	Well 1	Alluvium	0.41	6S/2W-26 SW-SE	1310' N, 2380' W fr SE cor S 26 OWRD: 1290' N, 2280' W fr SE cor S 26[a]
2	PROP 260	Well 2	Alluvium	0.41	6S/2W-26 SW-SW	445' N, 265' E fr SW cor S 26

* 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	195	NA	NA	NA	300	0-20	0-300	NA	TBD	NA	NA	NA
2	177	NA	NA	NA	300	0-20	0-300	NA	TBD	NA	NA	NA

Use data from application for proposed wells.

POA Well	Land Surface Elevation at Well (ft amsl)	Depth of First Water (ft bls)	SWL (ft bls)	SWL Date	Reference Level (ft bls)	Reference Level Date
1	195	NA	NA	NA	38.5[b]	3/26/1999[b]
2	177	NA	NA	NA	20.5[b]	3/26/1999[b]

A4. **Comments:** The proposed POA/POU is ~5.5 miles west of Silverton, Oregon.

[a] There is a discrepancy between the mapped location of the POA as indicated on the applicant's map and the metes-and-bounds description using the Department's PLSS projection. The mapped location is considered the most accurate and will be used for the purposes of this review. The OWRD suggested metes-and-bounds correspond to the mapped location based on the Department's PLSS projection. If the application is amended, the suggested metes-and-bounds should be used.
[b] Reference level extrapolated from nearby well MARI 18385.

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 proposed aquifer is confined. 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) **7RLA, 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 **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): NA

B3. **Groundwater availability remarks:** The proposed POAs are on fine-grained Missoula Flood deposits that extend from the surface to approximately 80 ft below land surface (O'Connor et al 2001). The proposed POAs are anticipated to develop the sand and gravel package of the Middle Sedimentary Unit (Conlon et al 2005) that is 100 to 150 ft thick and utilized by most of the Quaternary Late Tertiary Sediment (QLTS) aquifer-sourced wells in the area (MARI 17447, MARI 17992, MARI 4443, MARI 4445, MARI 4449, MARI 4447, MARI 17232, MARI 64480).

A review of statistics for nearby well records was completed and compared with the proposed rate of 0.41 cfs (~184 gpm) for this application (see Well Statistics). The median reported well yield is 100 gpm and the maximum reported well yield is 2,000 gpm. The proposed rate for this application is 184% of the median and 9% of the maximum reported yield. The proposed rate of use of 0.41 cfs (184 gpm) is likely within the capacity of the groundwater resource.

Water levels are stable (see Water Level Measurements in Nearby Wells). For the ten QLTS-observation wells within two miles of the proposed POA: all have at least a 10-year record; two of the wells do not have data within the last four years (MARI 4431, MARI 4439); all show minor declines but are overall steady. MARI 6564 has an extended record of 61 years with one foot increase in the last 20 years, a four ft decline from the start of the record in 1962, and a decline of 10 ft from the highest reading in 1998. There are 41 POAs for 41 groundwater rights within one mile of the POA, however, the overall steady water levels described above indicate that there is a low likelihood of interference with other groundwater users. The groundwater resource is not likely over-appropriated.

The nearest groundwater user to POA 1 is the MARI 4445 (Claim GR 122, priority date 7/29/1955), ~ 223 ft north of the POA at an elevation of 195 ft msl. It is likely the proposed use would cause some degree of well-to-well interference with MARI 4445. To assess the degree of drawdown, a Theis drawdown analysis was conducted for the proposed use (see attached Theis Drawdown Analysis-POA 1). Results indicate that the proposed use is not likely to cause well-to-well interference with MARI 4445 that exceeds the threshold under the standard condition for alluvial aquifers in the Willamette Basin.

The nearest groundwater user to POA 2 is the exempt domestic use well that serves tax lot 2100 at 6652 75th Ave NE Salem OR 97305, ~ 373 ft north of the POA at an elevation of 178 ft msl. The approximate center of the developed portion of the tax lot was selected as the likely location of a well. It is likely the proposed use would cause some degree of well-to-well interference with the well that serves tax lot 2100. To assess the degree of drawdown, a Theis drawdown analysis was conducted for the proposed use (see attached Theis Drawdown Analysis-POA 2). Results indicate that the proposed use is not likely to cause well-to-well interference with the well that serves tax lot 2100 that exceeds the threshold under the standard condition for alluvial aquifers in the Willamette Basin.

Based on this analysis of the available data and under the assumptions previously identified, groundwater for the proposed use is likely within the capacity of the resource; if a permit is issued for this application, the conditions in B1(d)(i) and B2(c) are recommended to protect senior users and the groundwater resource.

NOTE: This evaluation considers a conservative scenario for the nearest authorized POA not owned by the applicant. Other authorized POAs in the area may also experience an increase in interference as a result of this application, although to a lesser extent than the scenario evaluated here.

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	**Willamette aquifer**	☒	☐
2	**Willamette aquifer**	☒	☐

Basis for aquifer confinement evaluation: Water bearing zones in surrounding wells are confined by at least 62 ft of fine-grained sediments (MARI 17447, MARI 17992, MARI 4443, MARI 4445, MARI 4449, MARI 4447, MARI 17232, MARI 64480). Water levels rise above the producing zones, indicating a confined aquifer.

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 [a]	SW Elev ft msl[b]	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**Woods Creek**	**120-155**	**152-171**	**1,320**	☒	☐	☐	☐	☒
2	**1**	**Woods Creek**	**120-155**	**160-171**	**1,320**	☒	☐	☐	☐	☒
1	**2**	**Little Pudding River**	**120-155**	**130-140**	**6,316**	☒	☐	☐	☐	☒
2	**2**	**Little Pudding River**	**130-155**	**130-140**	**2,991**	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: SWLs in surrounding wells utilizing the QLTS aquifer vary from 120 to 155 ft msl[a] and the regional water table is greater than 160 ft msl (Woodward et al 1998). Within a mile of the POAs, the local streambed of SW 1 (Woods Creek) is 152 to 171 ft msl and of SW 2 (Little Pudding River) is 126 to 136 ft msl, indicating the local groundwater is likely discharging to surface water, consistent with Woodward et al (1998) findings that groundwater discharges to surface water. Both SW 1 (Woods Creek) and SW 2 (Little Pudding River) are flowing on the Missoula Flood deposits, and have not completely incised through the silt. Upstream bends in groundwater elevation contour lines near the proposed wells indicate groundwater discharge to streams incised into the Willamette Silt (Woodward et al 1998). Hydraulic connection to nearby streams is likely but expected to be limited by the confining Willamette Silt.

[a] Groundwater elevation calculated from static water level reported in well logs and/or latest static water level reported for MARI 17447, MARI 17992, MARI 4443, MARI 4445, MARI 4449, MARI 4447, MARI 17232, MARI 64480 and well head elevations estimated based on LIDAR measurements at existing well locations (Watershed Sciences, 2009).
[b] Surface water elevations were estimated from land surface elevations along stream reaches (Watershed Sciences, 2009; USGS, 2013).

Water Availability Basin the well(s) are located within: PUDDING R>MOLALLA R-AB MILL CREEK

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**	☐	**67.3**	☐	**<25%**	☐
2	**1**	☐	☐	**NA**	**NA**	☐	**67.3**	☐	**<25%**	☐
1	**2**	☐	☐	**NA**	**NA**	☐	**67.3**	☐	**<25%**	☐
2	**2**	☐	☐	**NA**	**NA**	☐	**67.3**	☐	**<25%**	☐

Comments: POAs 1 and 2 are anticipated to develop the confined sand and gravel aquifer overlain by Willamette Silt. **Both POA 1 and 2 are located exactly 0.25 miles from where SW 1 (Woods Creek) is mapped as transitioning from an intermittent to a perennial periodicity. In this area, periodicity is one of the determining factors for hydraulic connection, as**

intermittent streams may be assumed to lack baseflow and therefore lack hydraulic connection to groundwater. If either well, when drilled, is closer than 0.25 miles to a perennial surface water, then the Potential for Substantial Interference would exist per OAR 690-009-0040(a).

Potential depletion (interference with) SW 1 (Woods Creek) by proposed pumping at proposed POA 2 was estimated using Hunt 2003 analytical model. Hydraulic parameters used for the model were derived from regional data or studies of the hydrogeologic regime (OWRD Well Log Query Report; Conlon et al., 2003, 2005; Iverson 2002) or are within a typical range of values for the parameter within the hydrogeologic regime (Freeze and Cherry, 1979; Morris and Johnson 1967; Heath 1983). See attached "Stream Depletion Analysis – SW 1" for the specific parameters used in the analysis. The Hunt 2003 analytical model results indicate that depletion of (interference with) SW 1 due to pumping of the proposed POA is anticipated to be much less than 25 percent of the well discharge at 30 days of continuous pumping.

Because only the distance is expected to vary between the POA and surface water sources, only the POA-SW pair with the shortest distance (in this case, POA 2 and SW 1) was analyzed quantitatively for interference (stream depletion). All other POA-SW pairs would presumably result in less interference due to their greater separation relative to POA 2 and SW 1. Therefore, the interference of both proposed POA with all surface water sources within 1 mile are anticipated to result in much less than 25 percent of the well discharge at 30 days of continuous pumping.

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: NA-Q not distributed among wells.

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: NA-streams within 1 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: Both POA 1 and 2 are located exactly 0.25 miles from where SW 1 (Woods Creek) is mapped as transitioning from an intermittent to a perennial periodicity. In this area, periodicity is one of the**

determining factors for hydraulic connection. Therefore, the following Special Condition is recommended to preclude the Potential for Substantial Interference per OAR 690-009-0040(a):

1. **All wells operated under this authorization must be at least 0.25 miles from the nearest perennial surface water source.**

References Used:

Application File: G-19220

Pumping Test Files: MARI 4492, MARI 18385, MARI 51214, MARI 52920, MARI 62243, MARI 4437, MARI 6495, MARI 4414, MARI 4399, MARI 4443, MARI 3583, MARI 6489, MARI 6489, MARI 4766, MARI 4345, MARI 4751, MARI 3581, MARI 4327, MARI 4716, MARI 4407

Well Reports: MARI 17447, MARI 17992, MARI 4443, MARI 4445, MARI 4449, MARI 4447, MARI 17232, MARI 64480, MARI 18385, MARI 51214

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*, Scientific Investigations Report 2005-5168: U. S. Geological Survey, Reston, VA.

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

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.

Heath, R.C., 1983. Basic ground-water hydrology, U.S. Geological Survey Water-Supply Paper 2220, 86p.

Herrera, N.B., Burns, E.R., and Conlon, T.D., 2014, Simulation of groundwater flow and the interaction of groundwater and surface water in the Willamette Basin and Central Willamette subbasin, Oregon: U.S. Geological Survey Scientific Investigations Report 2014–5136, 152 p

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

Iverson, J., 2002, Investigation of the hydraulic, physical, and chemical buffering capacity of Missoula flood deposits for water quality and supply in the Willamette Valley of Oregon: Unpublished M.S. thesis, Oregon State University, 147 p.

Theis, C.V., 1935, The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using ground-water storage: American Geophysical Union transactions, v. 16, p. 519-524.

United States Geological Survey, 2013, National Elevation Dataset (NED) [DEM geospatial data]. 1/9th arc-second, updated 2013.

Watershed Sciences, 2009, LIDAR remote sensing data collection, Department of Geology and Mineral Industries, Willamette Valley Phase I, Oregon: Portland, OR, December 21.

Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82 p.

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:** NA

D4. ☐ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Water Availability Tables

Oregon Water Resources Department
Water Availability Analysis

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Water Availability Analysis
Detailed Reports

PUDDING R > MOLALLA R - AB MILL CR
WILLAMETTE BASIN
Water Availability as of 10/30/2023

Watershed ID #: 151 (Map)
Date: 10/30/2023

Exceedance Level: 80%
Time: 11:39 AM

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	1,040.00	125.00	915.00	0.00	36.00	879.00
FEB	1,180.00	114.00	1,070.00	0.00	36.00	1,030.00
MAR	1,010.00	76.50	934.00	0.00	36.00	898.00
APR	787.00	52.40	735.00	0.00	36.00	699.00
MAY	425.00	50.90	374.00	0.00	36.00	338.00
JUN	224.00	73.00	151.00	0.00	36.00	115.00
JUL	109.00	115.00	-5.87	0.00	36.00	-41.90
AUG	71.00	94.10	-23.10	0.00	36.00	-59.10
SEP	67.30	53.40	13.90	0.00	36.00	-22.10
OCT	91.60	11.50	80.10	0.00	36.00	44.10
NOV	363.00	48.50	314.00	0.00	36.00	278.00
DEC	957.00	118.00	839.00	0.00	36.00	803.00
ANN	706,000.00	56,300.00	650,000.00	0.00	26,100.00	626,000.00

Download Data (Text - Formatted , Text - Tab Delimited , Excel)

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PUDDING R > MOLALLA R - AB MILL CR
WILLAMETTE BASIN
Water Availability as of 10/30/2023

Watershed ID #: 151 (Map)
Date: 10/30/2023

Exceedance Level: 80%
Time: 11:40 AM

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

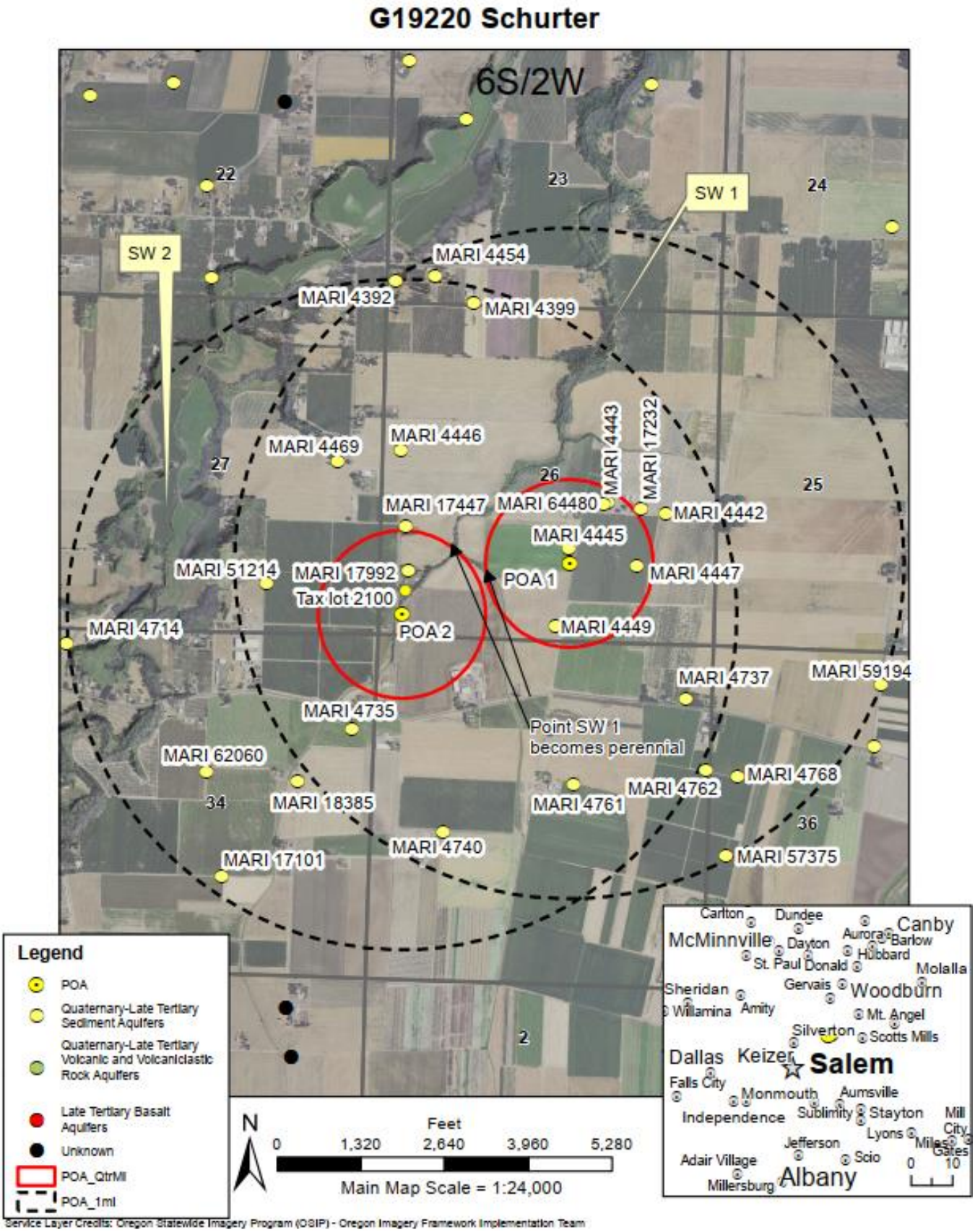
Detailed Report of Instream Flow Requirements

Instream Flow Requirements in Cubic Feet per Second

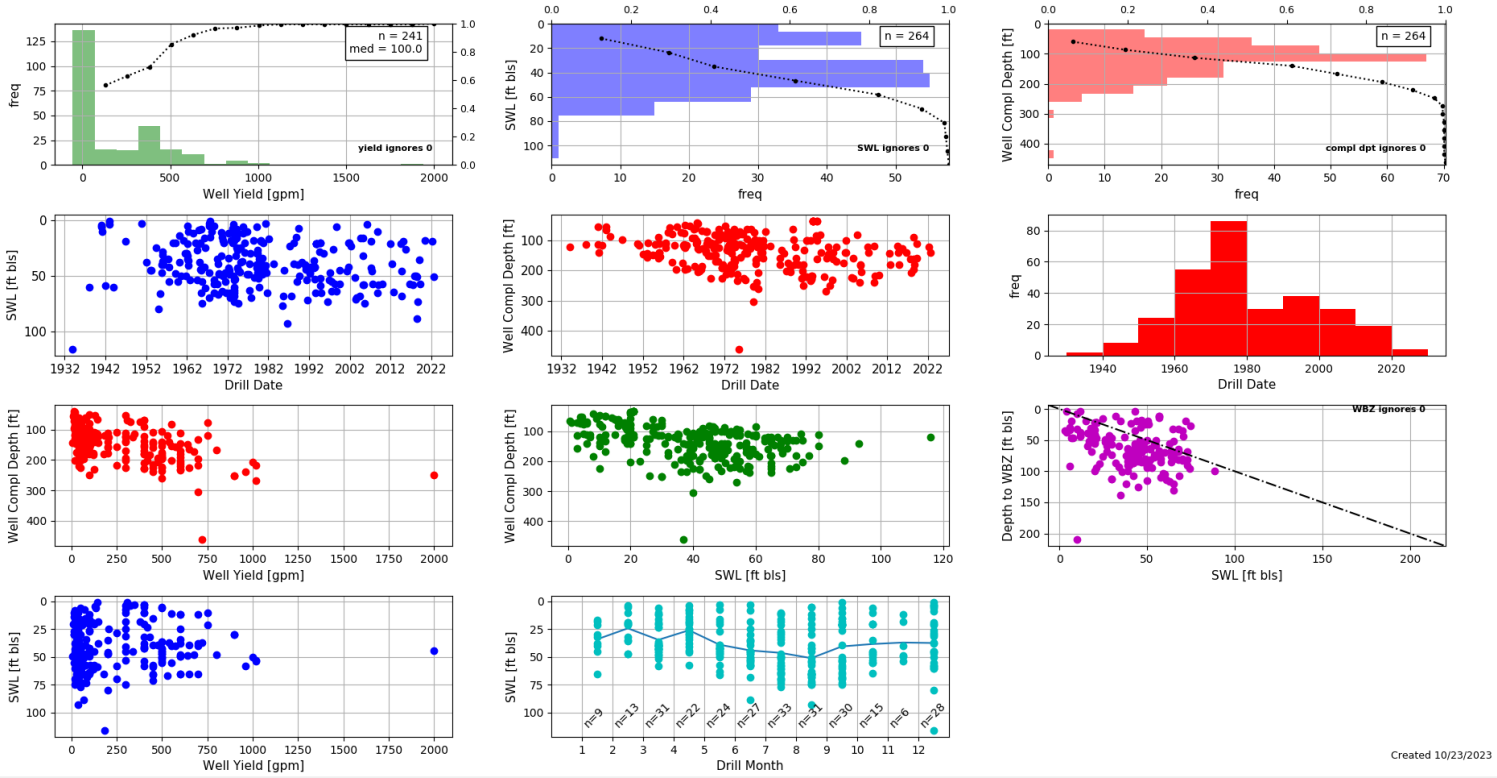
Application #	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MF151A	CERTIFICATE	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
IS73532B	CERTIFICATE	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00	36.00
IS73533A	CERTIFICATE	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
IS73534A	CERTIFICATE	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Maximum		**36.00**	**36.00**	**36.00**	**36.00**	**36.00**	**36.00**	**36.00**	**36.00**	**36.00**	**36.00**	**36.00**	**36.00**

Download Data (Text - Formatted , Text - Tab Delimited , Excel)

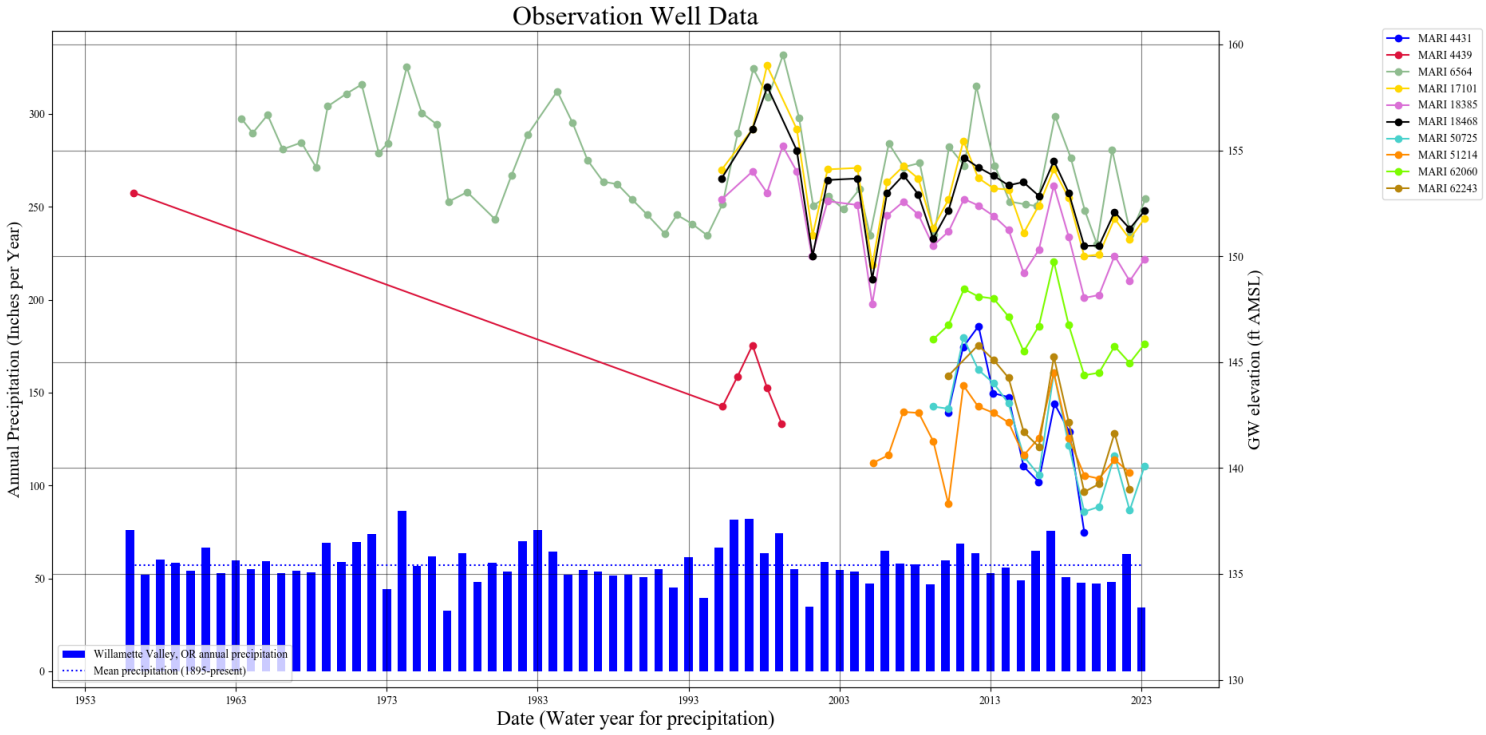
Well Location Map



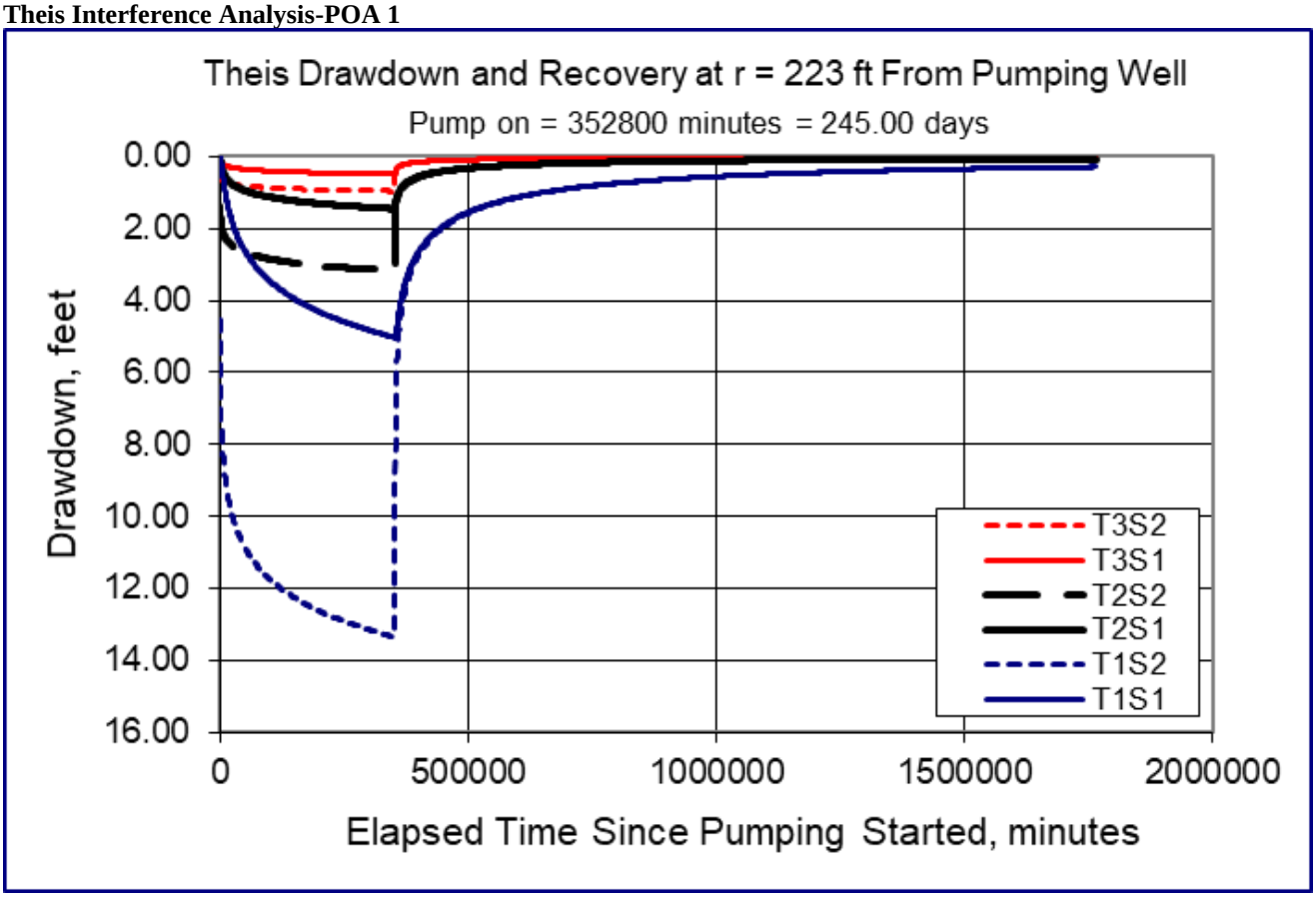
Well Statistics



Water-Level Measurements in Nearby Wells

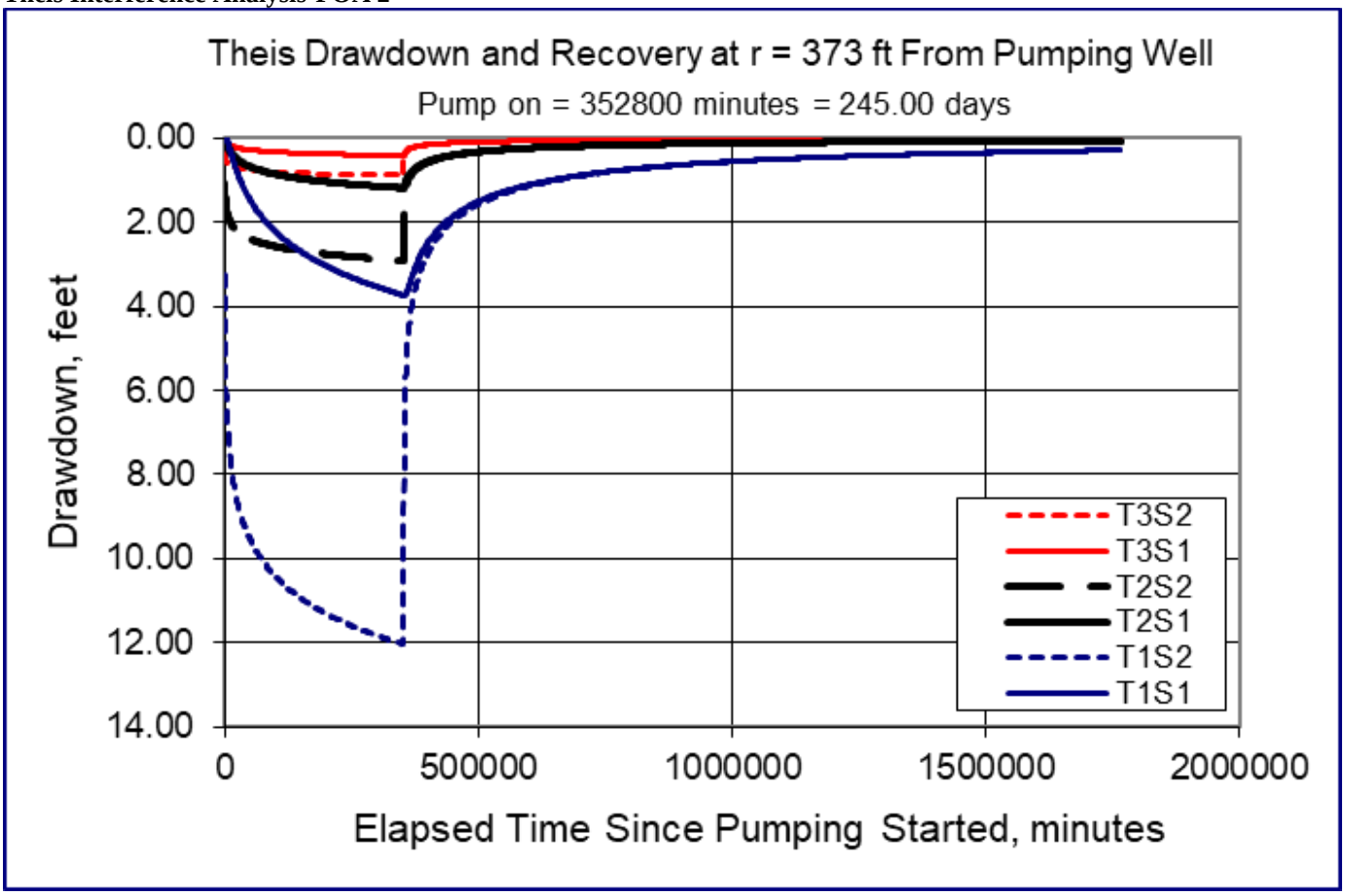


Theis Interference Analysis-POA 1



Radial distance from pumping well (r)=223 ft [estimated radial distance to nearest user, MARI 4445]
Pumping Rate (Q)= 0.168 cfs (~75.4 gpm)*
Aquifer Transmissivity (T1)= 6,732 gpd/ft (900 ft^2/day), (T2)= 32,762 gpd/ft (4,354 ft^2/day), (T3)= 119,613 gpd/ft (15,991 ft^2/day)
Storativity (s1) = 0.0003, (s2) = 0.2 [Conlon et al 2005, Table 1 values for Middle Sedimentary Unit, MSU]
Total pumping time=245
*The full pumping rate could not be utilized continuously for the entire 245-day period of use without exceeding the 81.75 ac-ft maximum allowed duty. For the maximum allowed duty of 81.75 ac-ft, continuous pumping would occur for 245 days at a rate of 0.168 cfs (~75.4 gpm).

Theis Interference Analysis-POA 2



Radial distance from pumping well (r)=373 ft [estimated radial distance to nearest user, well at tax lot 2100]
Pumping Rate (Q)= 0.168 cfs (~75.4 gpm)*
Aquifer Transmissivity (T1)= 6,732 gpd/ft (900 ft^2/day), (T2)= 32,762 gpd/ft (4,354 ft^2/day), (T3)= 119,613 gpd/ft (15,991 ft^2/day)
Storativity (s1) = 0.0003, (s2) = 0.2 [Conlon et al 2005, Table 1 values for Middle Sedimentary Unit, MSU]
Total pumping time=245
*The full pumping rate could not be utilized continuously for the entire 245-day period of use without exceeding the 81.75 ac-ft maximum allowed duty. For the maximum allowed duty of 81.75 ac-ft, continuous pumping would occur for 245 days at a rate of 0.168 cfs (~75.4 gpm).

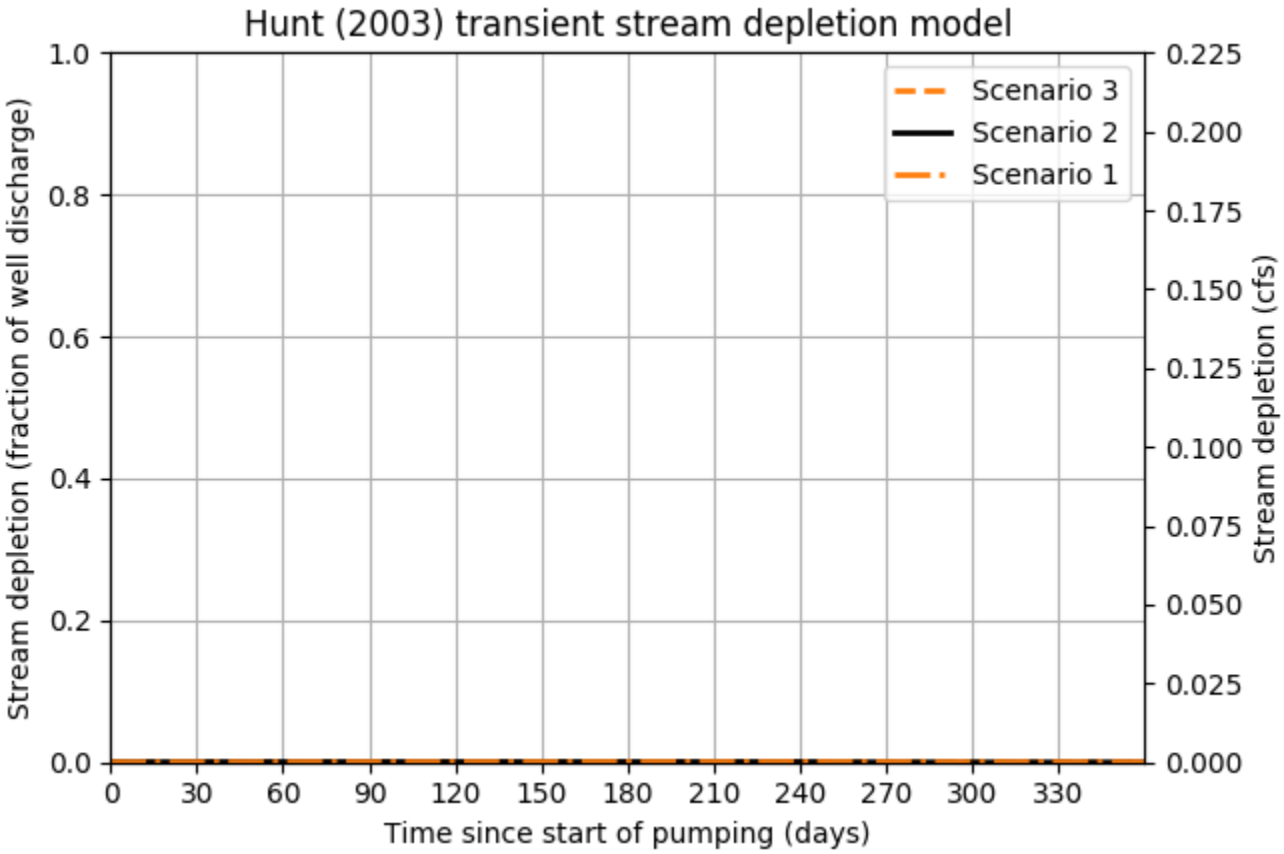
Stream Depletion (Hunt) Model Analysis

Application type:	G
Application number:	19220
Well number:	2
Stream Number:	1
Pumping rate (cfs):	0.168
Pumping duration (days):	245.0
Pumping start month number (3=March)	3.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	1320	1320	1320	ft
Aquifer transmissivity	T	900.0	4354.0	15991.0	ft2/day
Aquifer storativity	S	0.003	0.1	0.2	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.005	0.01	ft/day
Aquitard saturated thickness	ba	80.0	80.0	80.0	ft
Aquitard thickness below stream	babs	60.0	60.0	60.0	ft
Aquitard specific yield	Sya	0.2	0.2	0.2	-
Stream width	ws	10.0	10.0	10.0	ft

Stream depletion for Scenario 2:

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


Hunt (2003) transient stream depletion model
Scenario 3
Scenario 2
Scenario 1
Stream depletion (fraction of well discharge)
Stream depletion (cfs)
Time since start of pumping (days)
0.0
0.2
0.4
0.6
0.8
1.0
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
0.225
0
30
60
90
120
150
180
210
240
270
300
330