

Groundwater Transfer Review Summary Form

Transfer/PA # T- 13769 (RA)

GW Reviewer Travis Brown Date Re-Review Completed: 12/27/2022

Summary of Same Source Review:

☐ The proposed change in point of appropriation is not within the same aquifer as per OAR 690-380-2110(2).

Summary of Injury Review:

☒ The proposed transfer will result in another, existing water right not receiving previously available water to which it is legally entitled or result in significant interference with a surface water source as per 690-380-0100(3).

Summary of GW-SW Transfer Similarity Review:

☐ The proposed SW-GW transfer doesn't meet the definition of "similarly" as per OAR 690-380-2130.

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations.



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Ground Water Review Form:

- ☒ **Water Right Transfer**
☐ **Permit Amendment**
☐ **GR Modification**
☐ **Other**

Application: T-13769 re-review

Applicant Name: The Buck Family Trust c/o Cam Buck

Proposed Changes: ☒ POA ☐ APOA ☐ SW→GW ☒ RA
☐ USE ☒ POU ☐ OTHER

Reviewer(s): Travis Brown

Date of Review: 12/27/2022

Supersedes Review of: 9/3/2021

Date Reviewed by GW Mgr. and Returned to WRSD: iti 2/8/23

The information provided in the application is insufficient to evaluate whether the proposed transfer may be approved because:

- ☐ The water well reports provided with the application do not correspond to the water rights affected by the transfer.
- ☐ The application does not include water well reports or a description of the well construction details sufficient to establish the ground water body developed or proposed to be developed.
- ☐ Other _____

1. Basic description of the changes proposed in this transfer: Applicant proposes to change the POU and associated POA for 252 acres of **Certificate 90946**. 38.8 acres of the original POU would still be supplied by the original POA, "Well #2" (**MARI 54631**). This is a long distance and complex transfer, with the applicant proposing to split the proposed To-POU acreage amongst four different properties that are all greater than 3.5 miles from the authorized From-POU.

Will the proposed POA develop the same aquifer (source) as the existing authorized POA?

☒ Yes ☐ No Comments: The authorized From-POA "Well #2" (**MARI 54631**) produces groundwater from coarse sediment layers below ~158 ft bls within the alluvial aquifer system, with a total depth of 232 ft bls.

The proposed To-POA have proposed total depths for construction, but no proposed casing, seal, or screened/open intervals, except for the amended proposed POA BR #3 and RU #1, for which no proposed construction was provided. However, it is assumed that BR #3 and RU #1 would be constructed similarly to the other proposed To-POA. As such, all the proposed To-POA are anticipated to produce groundwater from the alluvial aquifer system.

2. a) Is there more than one source developed under the right (e.g., basalt and alluvium)?
☐ Yes ☒ No _____

b) If yes, estimate the portion of the right supplied by each of the sources and describe any limitations that will need to be placed on the proposed change (rate, duty, etc.): N/A

3. a) Will this proposed change, at its maximum allowed rate of use, likely result in an increase in interference with **another ground water right**?

☒ Yes ☐ No Comments: The proposed To-POA are at substantial distance (>3.5 miles) from the original authorized From-POA "Well #2" (MARI 54631). The proposed To-POA will all be near neighboring groundwater users that were previously largely unaffected by pumping under Certificate 90946. The reduced intervening distance between the proposed To-POA and neighboring groundwater users would likely cause an increase in interference with the neighboring groundwater users.

- b) If yes, would this proposed change, at its maximum allowed rate of use, likely result in another groundwater right not receiving the water to which it is legally entitled?

☐ Yes ☒ No If yes, explain: The Theis (1935) solution for drawdown in a confined aquifer was used to estimate the potential for injury to nearby senior groundwater users (see attached Theis Drawdown Analysis). Results of the analyses indicate the proposed pumping of the To-POA is unlikely to cause injury to neighboring senior rights.

4. a) Will this proposed change, at its maximum allowed rate of use, likely result in an increase in interference with **another surface water source**?

☒ Yes ☐ No Comments: The authorized From-POA and proposed To-POA are on opposite sides of two drainages (Champoege Creek and Case Creek) and are likely most hydraulically connected to different surface water sources. The surface water sources to which the authorized From-POA and proposed To-POA are likely most hydraulically connected and the distances from the POA to the surface water sources are summarized in the table below:

Authorized From-POA	Nearest Surface Water Source	Distance	Water Availability Basin (WAB) of Surface Water Source
"Well #2" (MARI 54631)	Murphy Creek	~4,300 ft	WID #30200708, Champoeg Cr > Willamette R – At Mouth
Proposed To-POA	Nearest Surface Water Source	Distance	Water Availability Basin (WAB) of Surface Water Source
BH #1	Senecal Creek	~3,150 ft	WID #30200901, Mill Cr > Pudding R – At Mouth
BH #2	Senecal Creek	~2,600 ft	WID #30200901, Mill Cr > Pudding R – At Mouth
BR #3	Unnamed Tributary of Case Creek	~2,200 ft	WID #30200708, Champoeg Cr > Willamette R – At Mouth
RU #1	Case Creek	~4,200 ft	WID #30200708, Champoeg Cr > Willamette R – At Mouth
RU #2	Case Creek	~5,100 ft	WID #30200708, Champoeg Cr > Willamette R – At Mouth
SSH #1	Unnamed Tributary of Case Creek	~1,000 ft	WID #30200708, Champoeg Cr > Willamette R – At Mouth
SSH #2	Case Creek	~2,900 ft	WID #30200708, Champoeg Cr > Willamette R – At Mouth
SSH #3	Case Creek	~2,100 ft	WID #30200708, Champoeg Cr > Willamette R – At Mouth

The closer proximity of the proposed To-POA to surface water sources which were previously largely unaffected by pumping under **Certificate 90946** will likely cause an increase in interference with these surface water sources. Transient numerical groundwater modeling in this area also indicates that groundwater pumping occurring further away from the Willamette River will cause greater steady-state depletion of local streams that have only partially penetrated the Willamette Silt, and less steady-state depletion of the mainstem Willamette River (Herrera et al., 2014, Fig. 45). Based on the location of the authorized From-POA and proposed To-POA, steady-state depletion of small local streams could increase by ~10 percent of the average annual rate of groundwater pumping (Herrera et al., 2014, Fig. 45).

b) If yes, at its maximum allowed rate of use, what is the expected change in degree of interference with any **surface water sources** resulting from the proposed change?

Stream: Senecal Creek

☐ Minimal ☒ Significant

Stream: Unnamed Tributary of Case Creek

☐ Minimal ☒ Significant

Stream: Case Creek

☐ Minimal ☒ Significant

Provide context for minimal/significant impact: Senecal Creek is in the Mill Cr > Pudding R – At Mouth Water Availability Basin (WAB), WID #30200901, whereas the original authorized POA only affected streams within the Champoeg Cr > Willamette R – At Mouth (WID #30200708) and Willamette R > Columbia R – AB Molalla R (WID #182) WABs. Although Senecal Creek isn't the closest surface water source to some of the proposed To-POA, all of the proposed To-POA are expected to have increased interference with Senecal Creek relative to the authorized From-POA (for which interference with Senecal Creek was likely nearly nonexistent). Due to the thick layer of fine-grained sediments separating the

subject aquifer from the streambed of Senecal Creek, after several years depletion of Senecal Creek and other overlying small streams due to pumping of the proposed To-POA would be continuous throughout the year (Herrera et al., 2014, Fig. 51). As such, it is anticipated that there would be a year-round increase in interference with Senecal Creek due to the proposed change. Per the Water Availability Reporting System (WARS), water in the Mill Cr > Pudding R – At Mouth (WID #30200901) WAB (which includes Senecal Creek) is already over-appropriated in the months of July, August, September, and November (see attached Water Availability Analysis). Likewise, due to the location of the proposed To-POA further from the Willamette River, more year-round steady-state depletion of the Unnamed Tributary of Case Creek and Case Creek itself is likely to occur (Herrera et al., 2014, Figs. 45 and 51). Per WARS, water in the Champoege Cr > Willamette R – At Mouth (WID #30200708) WAB (which includes Case Creek and its tributaries) is already over-appropriated in the months of June through October.

Because the proposed change would likely increase interference with surface water sources during periods in which those sources are typically over-appropriated, the expected change in degree of interference is significant.

5. For SW-GW transfers, will the proposed change in point of diversion affect the surface water source similarly (as per OAR 690-380-2130) to the authorized point of diversion specified in the water use subject to transfer?
☐ Yes ☐ No Comments: N/A
6. What conditions or other changes in the application are necessary to address any potential issues identified above: **Certificate 90946** contains the condition that the POA be cased and sealed to a minimum depth of 200 feet below land surface, subject to modification pursuant to the Department's August 12, 1999 letter in the file for application G-14884. This condition should be applied to the proposed To-POA in order to protect nearby surface water sources.

Certificate 90946 allows that the Director may require the water user to make and report annual static water level measurements, to be measured in the month of March. Measurements should be required to be collected and reported annually from the proposed To-POA in order to protect senior users. All measurements should be made by a qualified individual as specified in **Certificate 90946**.

Certificate 90946 contains a condition requiring the water user to discontinue use or reduce the rate of withdrawal from the well if annual water level measurements reveal a water level decline of 15 or more feet in fewer than five consecutive years or a water level decline of 25 or more feet compared against a reference level. Because the proposed To-POA are at substantial distance from the original authorized From-POA, different reference levels should be established for the proposed To-POA based on land surface elevation at the proposed To-POA locations and reliable water level measurements from nearby wells taken as close to the original signature date for Permit G-13763 (10/26/1999) as follow:

Proposed To-POA	Proposed Reference Level (ft bls)	Source
BH #1	26.50	MARI 60011, Permit Condition Measurement, 3/12/2008, 154.90 ft amsl
BH #2	25.10	MARI 60011, Permit Condition Measurement, 3/12/2008, 154.90 ft amsl

BR #3	36.20	MARI 1423, Permit Condition Measurement, 3/15/2006, 145.10 ft amsl
RU #1	6.70	MARI 55427, Permit Condition Measurement, 3/21/2002, 169.20 ft amsl
RU #2	10.10	MARI 55427, Permit Condition Measurement, 3/21/2002, 169.20 ft amsl
SSH #1	18.20	Average of Permit Condition Measurements: MARI 53178, 3/17/2000, 156.80 ft amsl MARI 54047, 3/27/2000, 158.34 ft amsl
SSH #2	22.80	Average of Permit Condition Measurements: MARI 53178, 3/17/2000, 156.80 ft amsl MARI 54047, 3/27/2000, 158.34 ft amsl
SSH #3	22.40	Average of Permit Condition Measurements: MARI 53178, 3/17/2000, 156.80 ft amsl MARI 54047, 3/27/2000, 158.34 ft amsl

Certificate 90946 allows that the Director may require pump test results every ten years. The pump(ing) test for the original authorized From-POA "Well #2" (**MARI 54631**) was completed in March 2007. Because the assessment of potential injury to neighboring senior wells included in this technical review is dependent upon aquifer parameters derived from pumping tests, and because the proposed To-POA are at substantial distance from the original authorized From-POA, the water user should be required to conduct and submit to the Department the results of pumping tests for the proposed To-POA in accordance with the standards and procedures presented in OAR 690-217. The applicant may request from the Department a waiver of the pumping test requirement in accordance with OAR 690-217-0015 and OAR 690-217-0020(3).

7. Any additional comments:

References:

Application File: T-13769, T-13326

Claim: GR-1202

Permit: G-13763

Certificate: 90946, 95641

Pumping Test Reports: MARI 614, 1314, 1382, 1386, 1403, 2211, 2351, 2360, 2374, 2472, 2968, 17466, 17503, 52215, 54047, 59731, 60041

Domenico, P.A. and Mifflin, 1965, Water from low-permeability sediments and land subsidence: Water Resource Research, v. 1, no. 4, p. 563-576.

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

Halford, K.J., and Kuniansky, E.L., 2002, Documentation of Spreadsheets for the Analysis of Aquifer-Test and Slug-Test Data, Open File Report 02-197, 51 p: U. S. Geological Survey, Reston, VA.

Herrera, N. B., Burns, E. R., Conlon, T. D., 2014, Simulation of groundwater flow and the interaction of groundwater and surface water in the Willamette Basin and Central Willamette

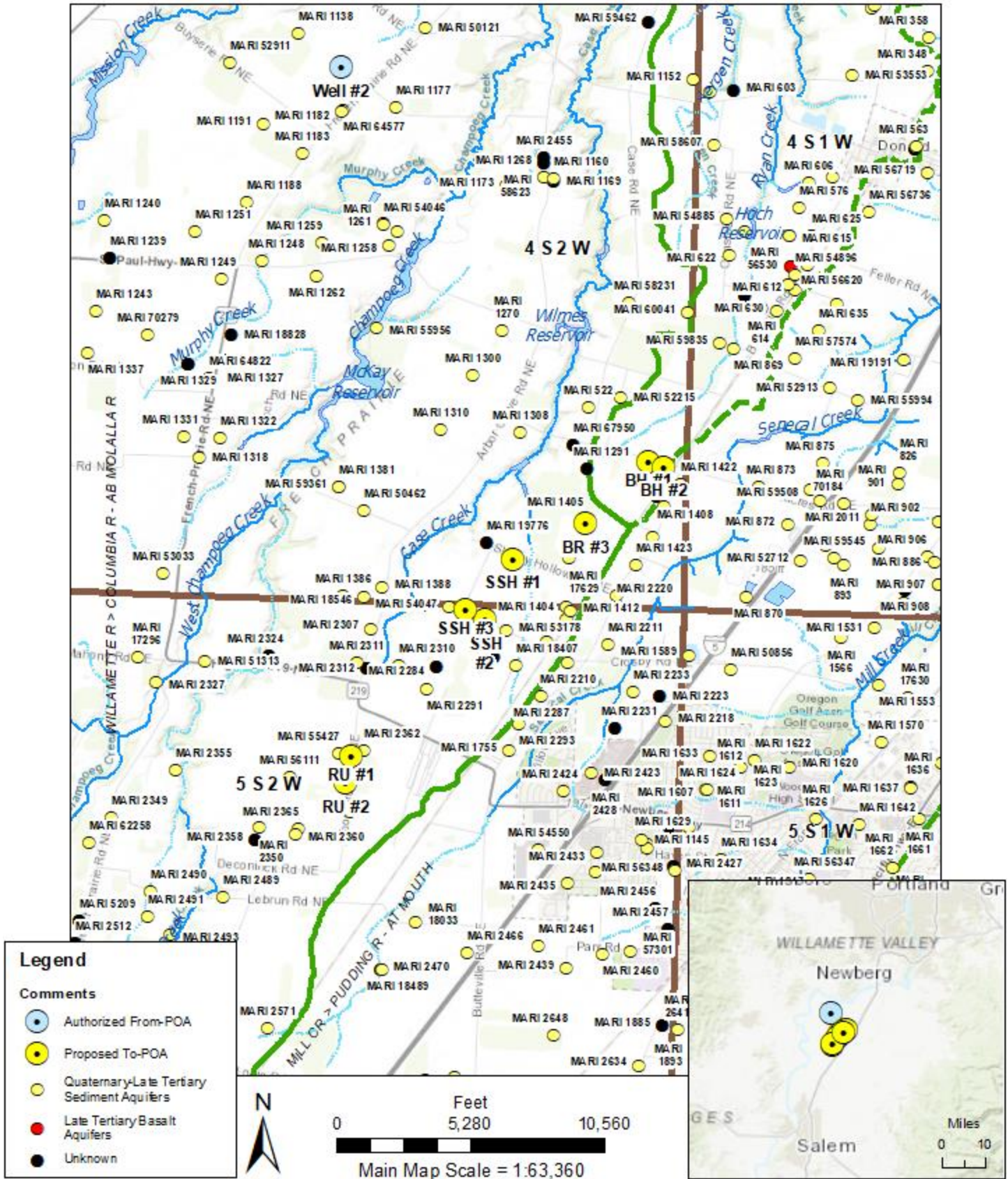
Subbasin, Oregon, Scientific Investigations Report 2014-5136: U. S. Geological Survey, Reston, VA.

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.

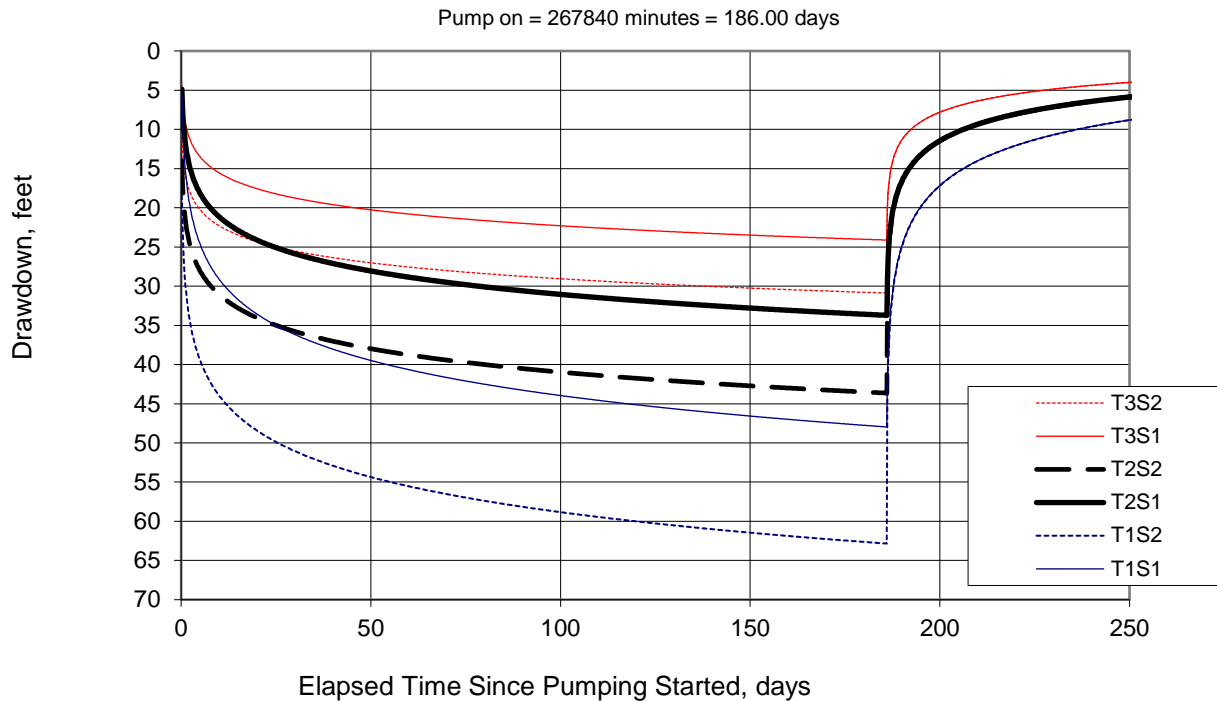
McFarland, W.D., and Morgan, D.S., 1996, Description of the Ground-Water Flow System in the Portland Basin, Oregon and Washington, Water Supply Paper 2470-A, 58 p: U. S. Geological Survey, Reston, VA.

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.

Well Location Map

T-13769 Buck Family Trust re-review

Theis Drawdown Analysis – RU #1, Maximum Pumping, Interference with MARI 2362

Theis Drawdown and Recovery at $r = 500$ ft From Pumping Well

Maximum pumping = 0.94 cfs

Pumping time = 186 days, time to reach maximum duty (346.75 ac-ft) at maximum rate

Transmissivity: T1=1000 ft²/day; T2=1500 ft²/day; T3=2200 ft²/day [Pumping Test Reports]

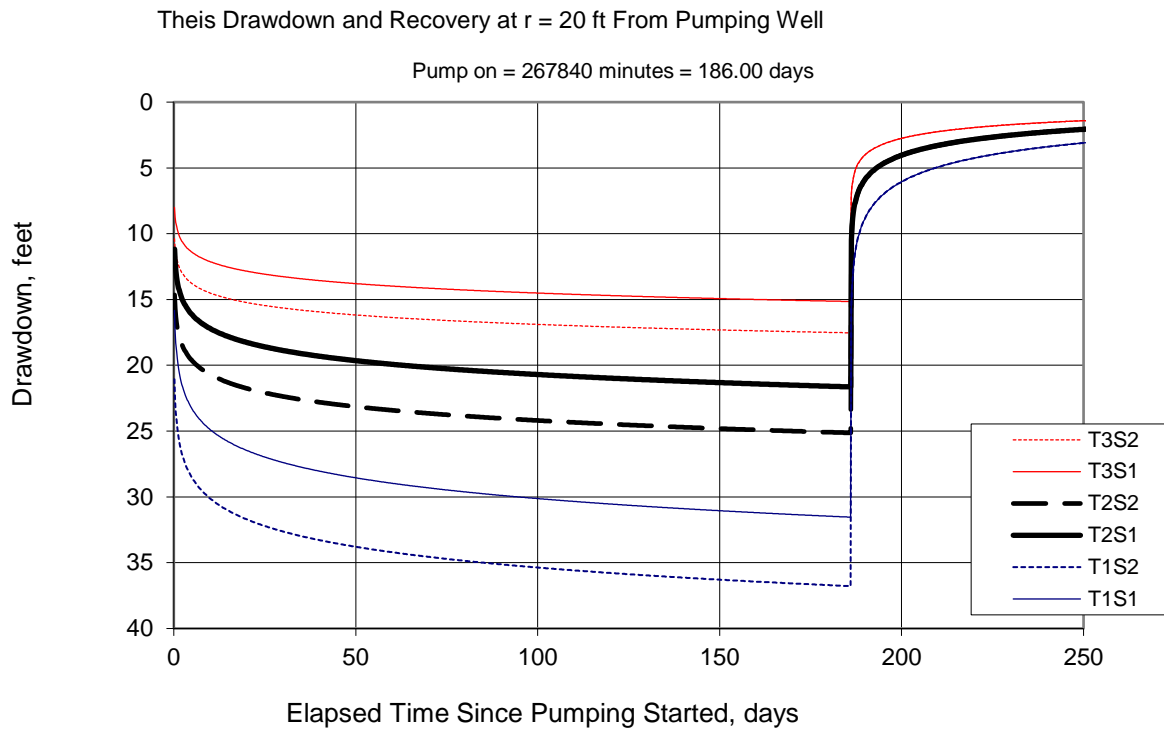
Storage coefficient: S1=0.001; S2=0.0001 [Domenico and Mifflin, 1965; Freeze and Cherry, 1979; Halford and Kuniansky, 2002; Iverson, 2002; McFarland and Morgan, 1996]

MARI 2362 SUI Analysis

Well is fully penetrating (TD=245)

	Unit	Source
Depth to water	15 ft bls	Log MARI 2362
Total depth	245 ft bls	Log MARI 2362
Water Column	230 ft	
Min Avail Drawdown	175 ft	Theis analysis, $r=1$ ft, $Q=2.0$ cfs
Pump buffer	10 ft	
Min Water Column	185 ft	
Interference Threshold	45 ft	

Theis Drawdown Analysis – BR #3, Maximum Pumping



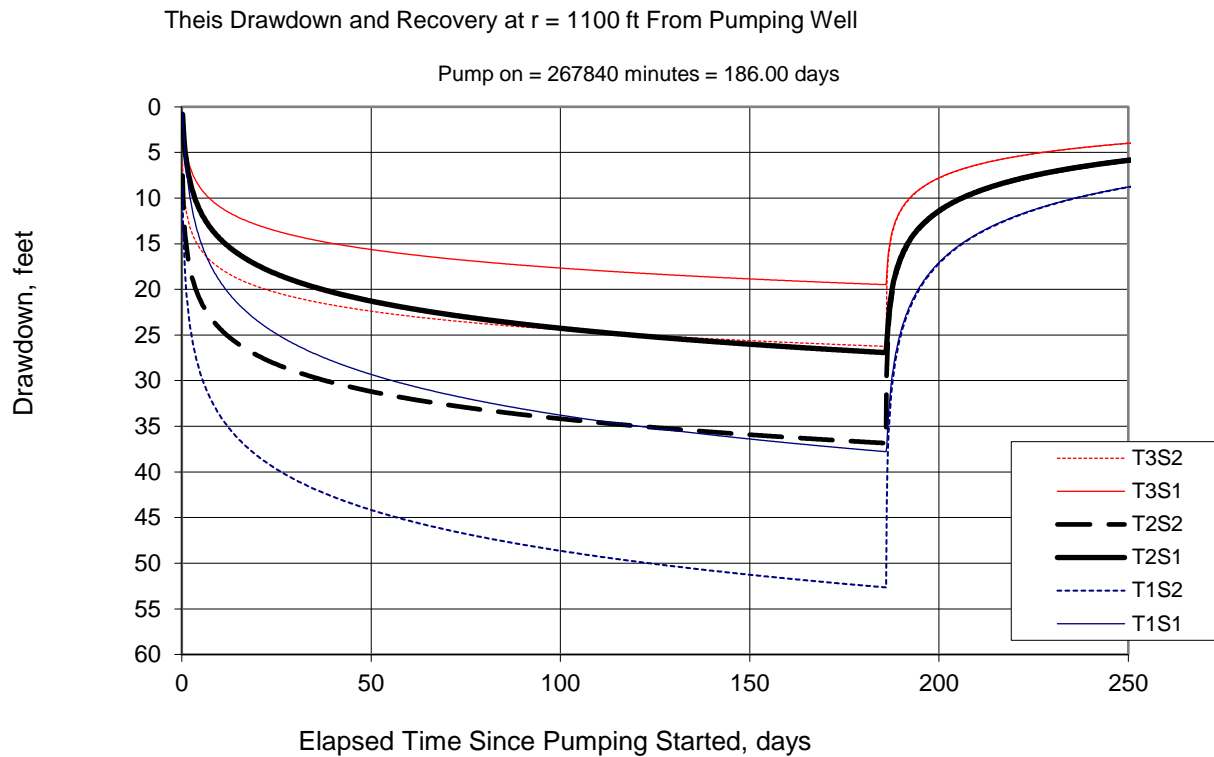
Maximum pumping rate = 0.331 cfs

Pumping time = 197 days, time to reach maximum duty (122 ac-ft) at maximum rate

Transmissivity: T1=1000 ft²/day; T2=1500 ft²/day; T3=2200 ft²/day [Pumping Test Reports]

Storage coefficient: S1=0.001; S2=0.0001 [Domenico and Mifflin, 1965; Freeze and Cherry, 1979; Halford and Kuniansky, 2002; Iverson, 2002; McFarland and Morgan, 1996]

Theis Drawdown Analysis – RU #2, Maximum Pumping



Maximum pumping rate = 0.94 cfs under all applicable rights

Pumping time = 186 days, time to reach maximum duty (347 ac-ft) at maximum rate

Transmissivity: T1=1000 ft²/day; T2=1500 ft²/day; T3=2200 ft²/day [Pumping Test Reports]

Storage coefficient: S1=0.001; S2=0.0001 [Domenico and Mifflin, 1965; Freeze and Cherry, 1979; Halford and Kuniansky, 2002; Iverson, 2002; McFarland and Morgan, 1996]

Water Availability Analysis

Water Availability Analysis

Detailed Reports

MILL CR > PUDDING R - AT MOUTH
WILLAMETTE BASIN

Water Availability as of 12/27/2022

Watershed ID #: 30200901 ([Map](#))

Exceedance Level: 80%

Date: 12/27/2022

Time: 12:03 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	39.20	9.74	29.50	0.00	0.00	29.50
FEB	53.90	9.88	44.00	0.00	0.00	44.00
MAR	38.40	9.47	28.90	0.00	0.00	28.90
APR	27.60	7.10	20.50	0.00	0.00	20.50
MAY	13.70	5.73	7.97	0.00	0.00	7.97
JUN	8.72	7.06	1.66	0.00	0.00	1.66
JUL	3.79	10.80	-7.05	0.00	0.00	-7.05
AUG	2.09	8.81	-6.72	0.00	0.00	-6.72
SEP	1.88	4.81	-2.93	0.00	0.00	-2.93
OCT	2.39	1.25	1.14	0.00	0.00	1.14
NOV	6.05	7.23	-1.18	0.00	0.00	-1.18
DEC	25.90	9.56	16.30	0.00	0.00	16.30
ANN	30,000.00	5,520.00	25,300.00	0.00	0.00	25,300.00

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

Water Availability as of 1/7/2020 for
CHAMPOEG CR > WILLAMETTE R - AT MOUTH

Watershed ID #: 30200708

Basin: WILLAMETTE

Exceedance Level: 80

Time: 12:00

Date: 01/07/2020

Month	Natural Stream Flow	CU + Stor Prior to 1/1/93	CU + Stor After 1/1/93	Expected Stream Flow	Reserved Stream Flow	Instream Water Rights	Net Water Available
1	37.30	8.64	0.00	28.66	0.00	0.00	28.66
2	51.70	8.16	0.00	43.54	0.00	0.00	43.54
3	22.40	5.11	0.00	17.29	0.00	0.00	17.29
4	10.90	3.96	0.00	6.94	0.00	0.00	6.94
5	6.15	6.11	0.00	0.04	0.00	0.00	0.04
6	3.04	7.88	0.00	-4.84	0.00	0.00	-4.84
7	2.94	12.32	0.00	-9.38	0.00	0.00	-9.38
8	1.88	9.99	0.00	-8.11	0.00	0.00	-8.11
9	1.08	5.42	0.00	-4.34	0.00	0.00	-4.34
10	1.00	1.37	0.00	-0.37	0.00	0.00	-0.37
11	10.10	5.79	0.00	4.31	0.00	0.00	4.31
12	47.80	11.51	0.00	36.29	0.00	0.00	36.29
Stor	28100	5220	0	22880	0	0	22880