

Groundwater Application Review Summary Form

Application # G- 19258

GW Reviewer Stacey Garrison/Travis Brown Date Review Completed: 6/12/2023

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

June 12 2023

TO: **Application G- 19258**

FROM: **GW: Stacey Garrison/Travis Brown**
 (Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

YES The source of appropriation is hydraulically connected to a State Scenic
 NO 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 6/12/2023
FROM: Groundwater Section Stacey Garrison/Travis Brown
SUBJECT: Application G- 19258 Supersedes review of

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 and Angela Kraemer County: Clackamas

A1. Applicant(s) seek(s) 0.0978 cfs from 2 well(s) in the Willamette Basin, Molalla-Pudding subbasin

A2. Proposed use irrigation Seasonality: March 1 through October 31

A3. Well and aquifer data (attach and number logs for existing wells; mark proposed wells as such under logid):

Table with 7 columns: 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

* Alluvium, CRB, Bedrock

Table with 13 columns: 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

Use data from application for proposed wells.

A4. Comments: The POAs/POUs are located 0.3 miles northeast of Scotts Mills, Oregon. Applicant proposes to irrigate at 0.0978 cfs (43.9 gpm) on up to 36 ac with a total annual volume limited to 90 af/year.
a Proposed well construction from applicant.
b There appears to be a discrepancy in the Public Lands Survey System (PLSS) projection used in the application map and that used by Department. The "metes-and-bounds" location descriptions provided in the application for the POAs are: 84 ft and 70 ft east of the mapped locations; the metes-and-bounds locations are used for this review.
c Well head elevation estimated based on LIDAR measurements at well locations (Watershed Sciences, 2009).

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 POAs are anticipated to develop confined aquifers; therefore, per OAR 690-502-0240, the relevant Willamette Basin Rules (OAR 690-502-0120) do not apply.

A6. Well(s) #, tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: NA
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:
- The permit should contain condition #(s) **7c (7-yrs measurements), medium water use reporting** _____;
 - The permit should be conditioned as indicated in item 2 below.
 - 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 **Scotts Mills Formation** 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 POAs/POUs are on the Scotts Mills Formation, a mid-Tertiary sequence of marine sedimentary origin that overlies and interbeds with the Little Butte Volcanics (Miller and Orr 1986, Tolan and Beeson 1999). The Scotts Mills Formation is exposed at the surface here and overlain by thin layers of alluvial deposits near streams and rivers (Tolan and Beeson 1999). Mapping of the members of the Scotts Mills Formation indicates the proposed wells would most likely be located on the Marquam member of the Scotts Mills Formation, with the potential for alluvial deposits from Marquam Creek near the surface (Miller and Orr 1986). Based on the mapped geological series within the vicinity of the proposed POA locations and the proposed depth of the POAs, it is anticipated that the POAs would develop the Marquam basal member of the Scotts Mills Formation, a volcanic and fossiliferous bedrock unit. Department-located wells within 1 mile of the POAs and utilizing the Tertiary Marine Volcanic and Sedimentary (TMVS) aquifer system (CLAC 60382, CLAC 73226, MARI 55695, CLAC 15256, CLAC 15260, CLAC 15244, CLAC 15250, CLAC 15245, CLAC 15241, CLAC 73835) identify layers of shale, claystone, sandstone, siltstone, soapstone, and basalt. There are multiple water-bearing zones, WBZs, ranging from 30 to 520 ft bls (-45 to 568 ft msl), range in thickness from 1 to 140 ft, and are described in well logs as hard and/or fractured sandstones, claystones, siltstones, and shales. The SWLs range from 301 to 572 ft msl and are above the elevation of the top of the WBZs, indicating confined conditions. Primary porosity is typically compromised in these aquifers resulting in well yields of 5 gpm and less, although fractured zones can demonstrate higher yields (Freeze and Cherry 1979, Conlon et al 2005).
- A review of statistics for nearby well records was completed and compared with the proposed rate of 0.0978 cfs (43.9 gpm) for this application (see Well Statistics). The proposed rate of use of 0.0978 cfs (43.9 gpm) is likely within the capacity of the groundwater resource; median reported well yield is 24 gpm, and the maximum reported yield is 450 gpm. The proposed rate for this application is 183% of the median and 10% of the maximum reported yield. Lithology and aquifer identification are not available for all wells in the Department's database, and the higher yields in the query may be utilizing Columbia River Basalt or alluvial sediments of the Willamette Aquifer and not be representative of the Scotts Mills Formation. For the 9 productive wells included in the geology analysis above the maximum yield is 100 gpm, the minimum is 5 gpm, and the median is 29 gpm.
- Department SWL data is limited in this area (1 to 5 miles from POAs) to five wells that utilize the same portion of the TMVS aquifer targeted by the POAs; this limited data indicate water level trends are declining (see Water Level Measurements in

Nearby Wells). Four of the wells (CLAC 60456, MARI 9318, MARI 51915, MARI 58081) have declined approximately 10 ft (7 to 12 ft) in the last 10 years, and MARI 57858 has declined approximately 40 ft in 8 years. The deeper fractured WBZs of the TMVS aquifer are likely more susceptible to over-drafting due to the mineralization deposits in the fractures, reduced recharge, and the discontinuity of fracture flow paths (Conlon et al 2005, Piper 1942). **The proposed use will not likely be available within the capacity of the groundwater resource.** Data provided with the application and during this review indicate that **water levels in the well nearest the proposed POAs and completed to a similar depth as the proposed POAs (CLAC 15256) have declined excessively** (see CLAC 15256 well log, CLAC 15256 well test report, and CLAC 15256 email, attached). The SWL recorded on the well log for CLAC 15256 is the highest known water level, and recent SWL measurements taken in December 2020 and March 2023 show declines that exceed 50 ft, meeting the criteria of declined excessively in OAR 690-008-0001 (4) (d). The CLAC 15256 well log SWL is plausible based on the comparable SWL for a nearby well completed to a similar depth as CLAC 15256 and the proposed POAs (CLAC 15245). **There is a preponderance of evidence to support that the water levels in the groundwater reservoir are declined excessively; therefore, the groundwater reservoir is over-appropriated.**

The nearest groundwater user to Well 1 is CLAC 15260 (an exempt domestic well) 697 ft northwest of the POA at an elevation of ~466 ft msl. CLAC 15260 is drilled to 119 ft bls [347 ft msl] with a WBZ from 62 to 63 ft bls [380 to 381 ft msl], and a seal depth of 22 ft bls [421 ft msl]. It is likely the proposed use would cause some degree of well-to-well interference with CLAC 10257. To assess the degree of drawdown, a Theis drawdown analysis was conducted for the proposed use (see attached **Theis Drawdown Analysis-Well 1**). Results indicate that the proposed use is not likely to cause well-to-well interference with CLAC 15260 that exceeds the threshold under the standard condition for TMVS aquifers in the Willamette Basin.

The nearest groundwater user to Well 2 is property at 9905 S Cemetery Rd Molalla OR and is likely MARI 55695 (an exempt domestic well), 476 ft northwest of the POA at an elevation of ~475 ft msl. The well log for MARI 55695 does not record GPS coordinates and the address listed for the well location is not a physical situs address; however, the taxlot number and the TRS Q-Q match this taxlot. A small structure resembling a well house visible via aerial imagery was identified as the most likely well location. MARI 55695 is drilled to 520 ft bls [-45 ft msl] with a WBZ from 318 to 520 ft bls [-45 to 157 ft msl], and a seal depth of 10 ft bls [465 ft msl]. It is likely the proposed use would cause some degree of well-to-well interference with MARI 55695. To assess the degree of drawdown, a Theis drawdown analysis was conducted for the proposed use (see attached **Theis Drawdown Analysis-Well 2**). Results indicate that the proposed use is not likely to cause well-to-well interference with CLAC 57932 that exceeds the threshold under the standard condition for TMVS 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 over-appropriated and the proposed use will not likely be available within the capacity of the groundwater 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	Bedrock	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Bedrock	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: The proposed POAs are anticipated to utilize equivalent WBZs and have similar construction to CLAC 15256. The SWL is above the bottom of the overlying confining layer in this and surrounding wells, indicating confined aquifer conditions. The proposed wells will be drilled to a maximum depth of 500 ft bls and continuously sealed from the surface to 20 ft bls.

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?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Butte Creek	248-572	361-537	1,341 ^d	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Butte Creek	248-572	361-537	1,615	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	Marquam Creek	248-572	344-524	1,915	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	2	Marquam Creek	248-572	344-524	1,535	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: Proposed POAs are anticipated to be continuously sealed to 20 ft bls [447 to 474 ft msl]. SWLs in surrounding wells utilizing the TMVS aquifer vary from 248 to 572 ft msl (CLAC 73835, CLAC 15241, CLAC 15245, CLAC 15250, CLAC 15256, CLAC 15260, CLAC 73226, CLAC 60382, and MARI 55695). Gannett and Caldwell (1998) report water table elevations ranging from 340 to 400 ft msl in this area. The local streambed of SW 1 (Butte Creek) is 361 to 537 ft msl and of SW 2 (Marquam Creek) is 344 to 524 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. The surface water drainages have incised below the elevation of the shallower WBZs of the wells within a mile, which range from -45 to 568 ft msl^c. The potential WBZ for the POAs is -33 to 474 ft msl with the seal extending to 20 ft bls. Hydraulic connection to nearby streams is likely but anticipated to be inefficient due to the low vertical permeability of the overlying fine-grained sediments and intermittent fracturing that facilitates hydraulic connectivity.

^a Groundwater elevation calculated from static water level reported in well logs and/or latest static water level reported for CLAC 73835, CLAC 15241, CLAC 15245, CLAC 15250, CLAC 15256, CLAC 15260, CLAC 73226, CLAC 60382, and MARI 55695 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).

^c Water-bearing zone elevations calculated from water-bearing layers reported in well logs CLAC 73835, CLAC 15241, CLAC 15245, CLAC 15250, CLAC 15256, CLAC 15260, CLAC 73226, CLAC 60382, and MARI 55695

^d In accordance with OAR 690-009-0040(4)(a), PSI is assumed for POAs within 0.25 miles (1,320 ft) of surface water and in hydraulic connection with surface water; given variations in projections and coordinate systems in geographic information systems, the final well location should be verified to be a distance greater than 0.25 miles (1,320 ft) from surface water.

Water Availability Basin the well(s) are located within:

SW 1 (Butte Creek): BUTTE CR>PUDDING R-AT MOUTH

SW 2 (Marquama Creek): PUDDING R>MOLALLA R-AB MILL CR

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	<input type="checkbox"/>	<input type="checkbox"/>	IS69799 A	75	<input type="checkbox"/>	9.78	<input type="checkbox"/>	<25%	<input type="checkbox"/>
2	1	<input type="checkbox"/>	<input type="checkbox"/>	IS69799 A	75	<input type="checkbox"/>	9.78	<input type="checkbox"/>	<25%	<input type="checkbox"/>
1	2	<input type="checkbox"/>	<input type="checkbox"/>	IS73532 B	36	<input type="checkbox"/>	67.3	<input type="checkbox"/>	<25%	<input type="checkbox"/>
2	2	<input type="checkbox"/>	<input type="checkbox"/>	IS73532 B	36	<input type="checkbox"/>	67.3	<input type="checkbox"/>	<25%	<input type="checkbox"/>

Comments: Potential depletion (interference with) SW 1 (Butte 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 1 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 1 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?
			<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
			<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

Comments: NA-Q is 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:**

References Used:

Application File: G-19258

Pumping Test Files: MARI 18044, MARI 57858, MARI 58081

Well Reports: MARI 18044, MARI 57858, MARI 58081, CLAC 73835, CLAC 15241, CLAC 15245, CLAC 15250, CLAC 15244, CLAC 15256, CLAC 15260, MARI 55695, CLAC 73226, CLAC 60382

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.

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.

Miller, P.R. and Orr, W.N. 1986. *The Scotts Mill Formation: Mid-Tertiary geologic history and paleogeography of the central Western Cascade Range, Oregon*. Oregon Geology, DOGAMI 48(12): 139-151.

Morris, D.A. and A.I. Johnson, 1967. *Summary of hydrologic and physical properties of rock and soil materials as analyzed by the Hydrologic Laboratory of the U.S. Geological Survey*, U.S. Geological Survey Water-Supply Paper 1839-D, 42p

Piper, A.M. 1942. *Ground-water resources of the Willamette Valley, Oregon*. USGS Water Supply Paper 890

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.

Tolan, T.L. and Beeson, M.H. 1999. *Geologic Map of the Scotts Mills, Silverton, and Stayton Northeast 7.5 Minute Quadrangles, Northwest Oregon: A Digital Database*: U. S. Geological Survey Open-File Report 99-141, 11 pp., <https://pubs.usgs.gov/of/1999/0141/>

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:** _____

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

Water Availability Tables

SW 1-Butte Creek

Oregon Water Resources Department
 Water Availability Analysis

[Main](#) [Help](#)
[Return](#) [Contact Us](#)

Water Availability Analysis
Detailed Reports

BUTTE CR > PUDDING R - AT MOUTH
WILLAMETTE BASIN

Water Availability as of 4/5/2023

Watershed ID #: 69799 [\(Map\)](#)
Exceedance Level: 80% ▼

Date: 4/5/2023
Time: 2:00 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	169.00	3.61	165.00	0.00	75.00	90.20
FEB	181.00	3.64	177.00	0.00	75.00	102.00
MAR	172.00	2.73	169.00	0.00	75.00	94.30
APR	142.00	2.27	140.00	0.00	75.00	64.70
MAY	89.20	5.59	83.60	0.00	75.00	8.61
JUN	39.00	10.30	28.70	0.00	75.00	-46.30
JUL	15.10	17.00	-1.87	0.00	25.00	-36.90
AUG	9.90	13.60	-3.70	0.00	12.00	-15.70
SEP	9.78	6.97	2.81	0.00	20.00	-17.20
OCT	15.10	1.00	14.10	0.00	75.00	-60.90
NOV	66.00	1.86	64.10	0.00	75.00	-10.90
DEC	170.00	3.96	166.00	0.00	75.00	91.00
ANN	121,000.00	4,410.00	117,000.00	0.00	44,100.00	79,000.00

Water Availability Analysis Detailed Reports

BUTTE CR > PUDDING R - AT MOUTH
WILLAMETTE BASIN

Watershed ID # 69799 [\(Map\)](#)
Date: 4/5/2023

Exceedance Level: 80%
Time: 2:01 PM

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

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
IS69799A	CERTIFICATE	75.00	75.00	75.00	75.00	75.00	75.00	25.00	12.00	20.00	75.00	75.00	75.00
Maximum		75.00	75.00	75.00	75.00	75.00	75.00	25.00	12.00	20.00	75.00	75.00	75.00

SW 2-Marquam Creek

Water Availability Analysis Detailed Reports

PUDDING R > MOLALLA R - AB MILL CR
WILLAMETTE BASIN

Watershed ID # 151 [\(Map\)](#)
Date: 4/5/2023

Exceedance Level: 80%
Time: 1:59 PM

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

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	933.00	0.00	36.00	897.00
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	-8.88	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	48.60	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

Water Availability Analysis Detailed Reports

PUDDING R > MOLALLA R - AB MILL CR
WILLAMETTE BASIN

Watershed ID # 151 [\(Map\)](#)
Date: 4/5/2023

Exceedance Level: 80%
Time: 1:55 PM

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

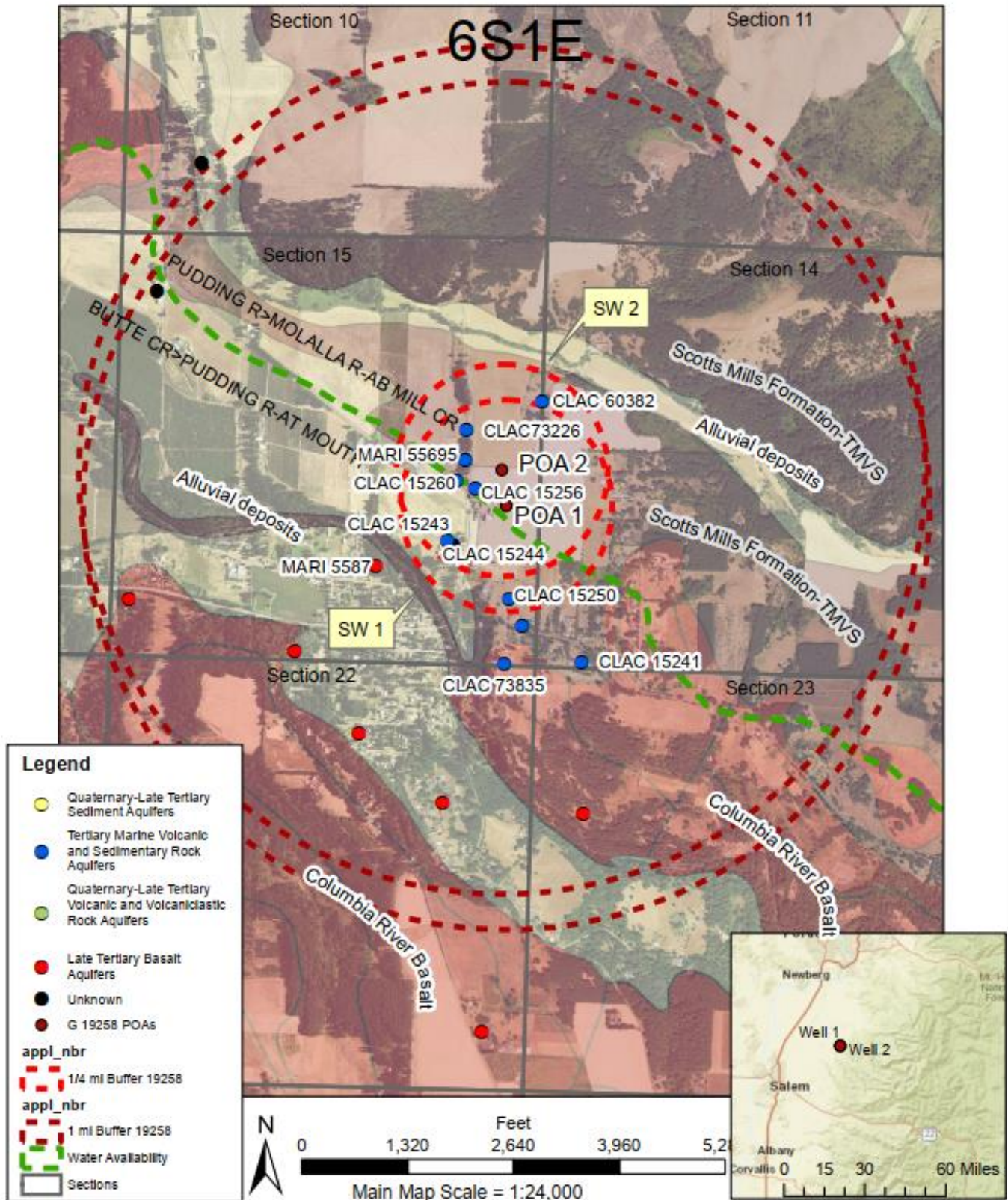
Detailed Report of Instream Flow Requirements

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

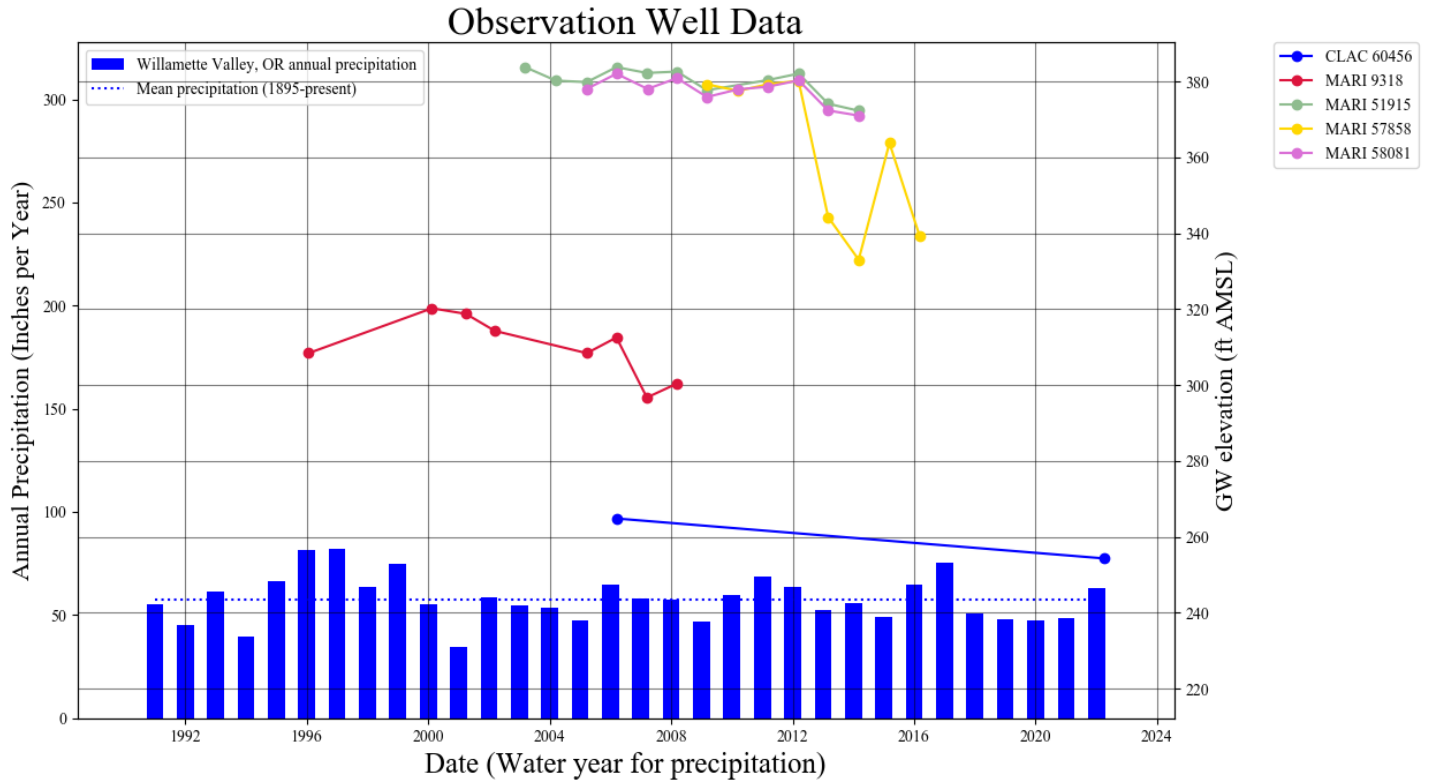
Well Location Map

G19258 Kraemer

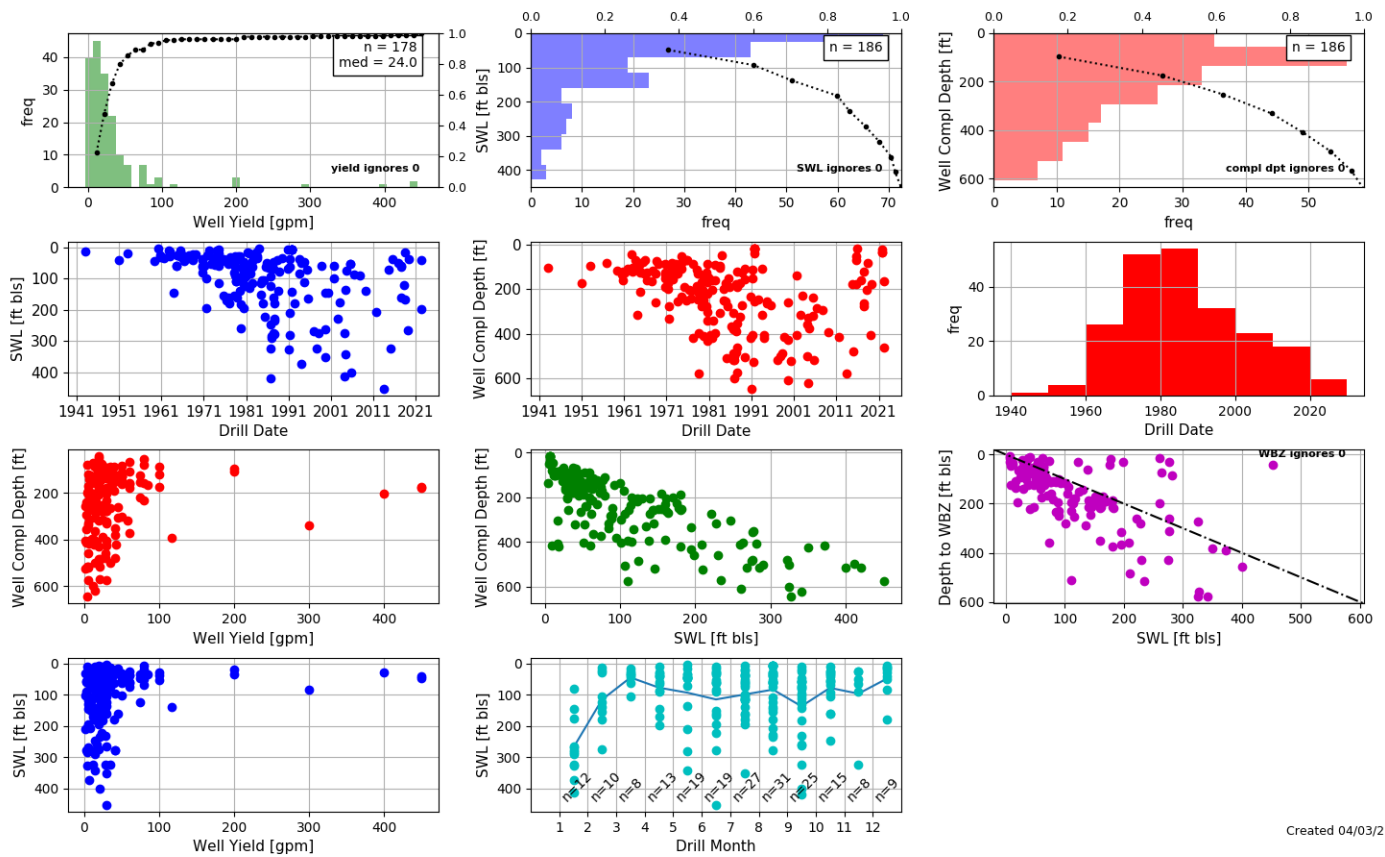


Service Layer Credits: Oregon Statewide Imagery Program (OSIP) - Oregon Imagery Framework Implementation Team
 Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Water-Level Measurements in Nearby Wells



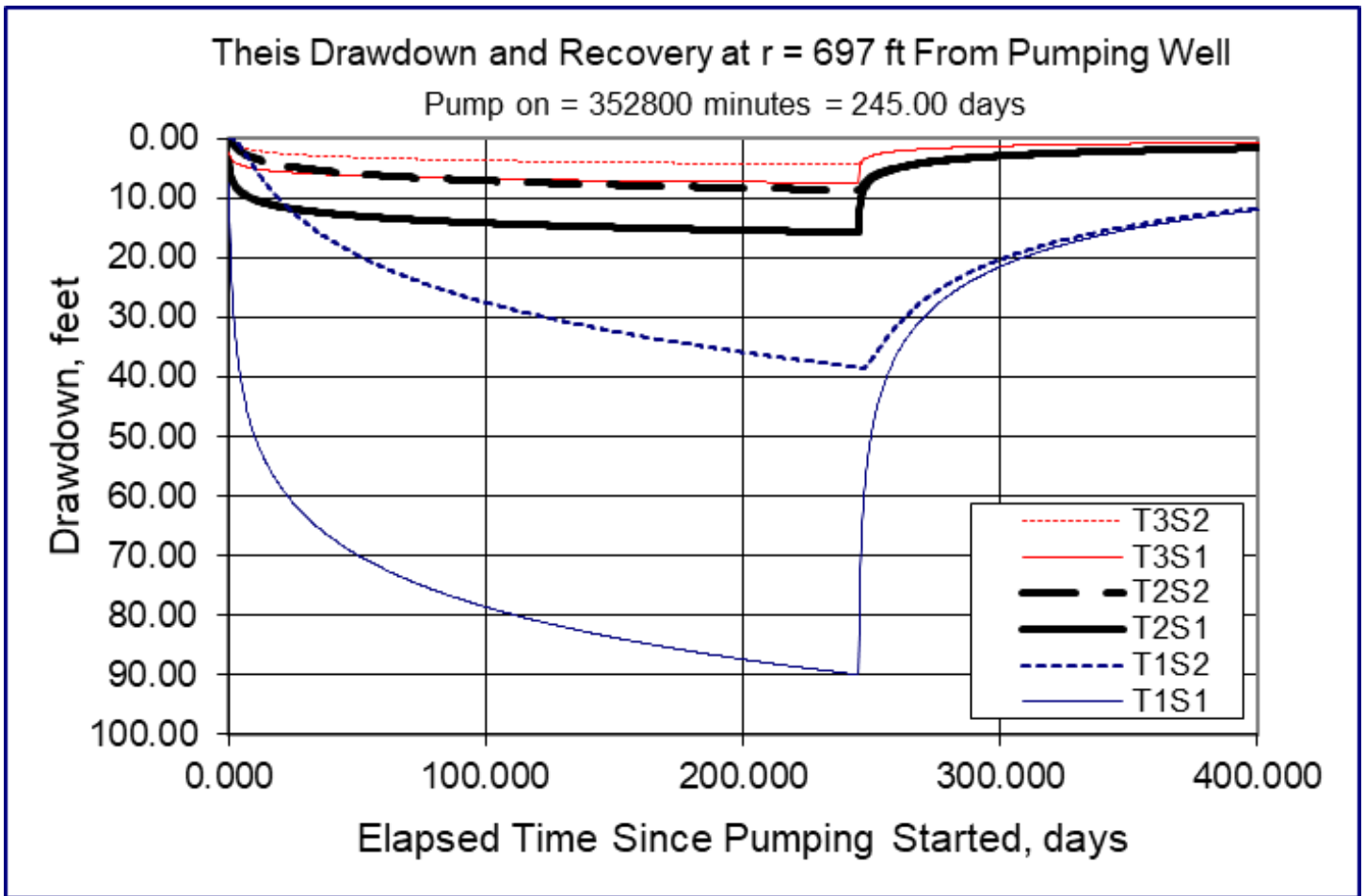
Well Statistics 6S/1E-15 and surrounding sections



Created 04/03/2023

This Drawdown Analysis

Well 1



Radial distance from pumping well (r)=697 ft [estimated radial distance to nearest user, CLAC 15260]

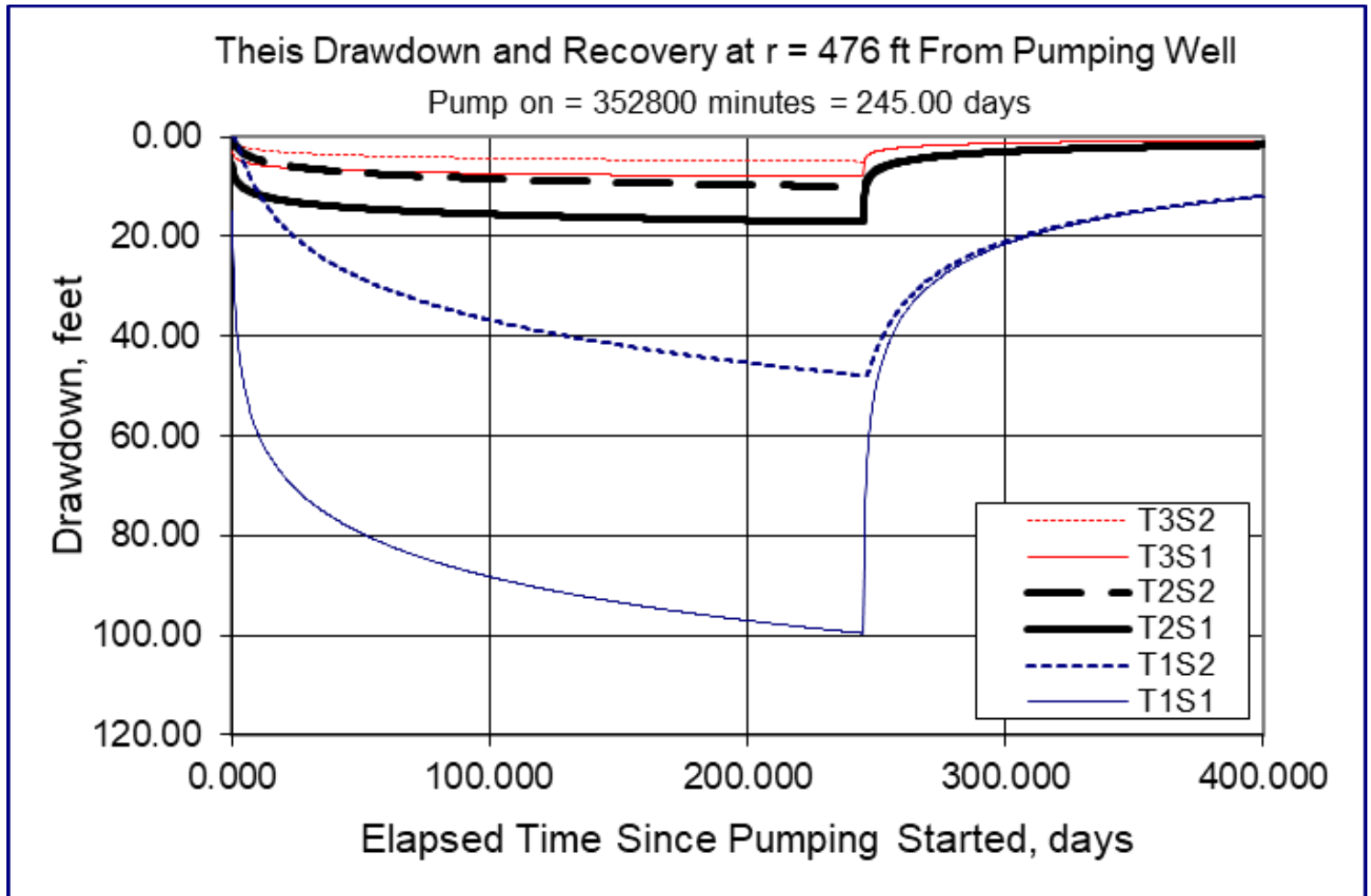
Pumping Rate (Q)= 0.0978 cfs (~43.9 gpm)

Aquifer Transmissivity (T1)= 396 gpd/ft (53 ft²/day), (T2)= 2,898 gpd/ft (387 ft²/day), (T3)= 6,687 gpd/ft (894 ft²/day)

Storativity (s1) = 0.00005, (s2) = 0.003 [Conlon et al 2005, Table 2 values for Basement Confining Unit]

Total pumping time=245 days [irrigation season, March 1-October 31]

Well 2



Radial distance from pumping well (r)=476 ft [estimated radial distance to nearest user, MARI 55695]

Pumping Rate (Q)= 0.0978 cfs (~43.9 gpm)

Aquifer Transmissivity (T1)= 396 gpd/ft (53 ft²/day), (T2)= 2,898 gpd/ft (387 ft²/day), (T3)= 6,687 gpd/ft (894 ft²/day)

Storativity (s_1) = 0.00005, (s_2) = 0.003 [Conlon et al 2005, Table 2 values for Basement Confining Unit]

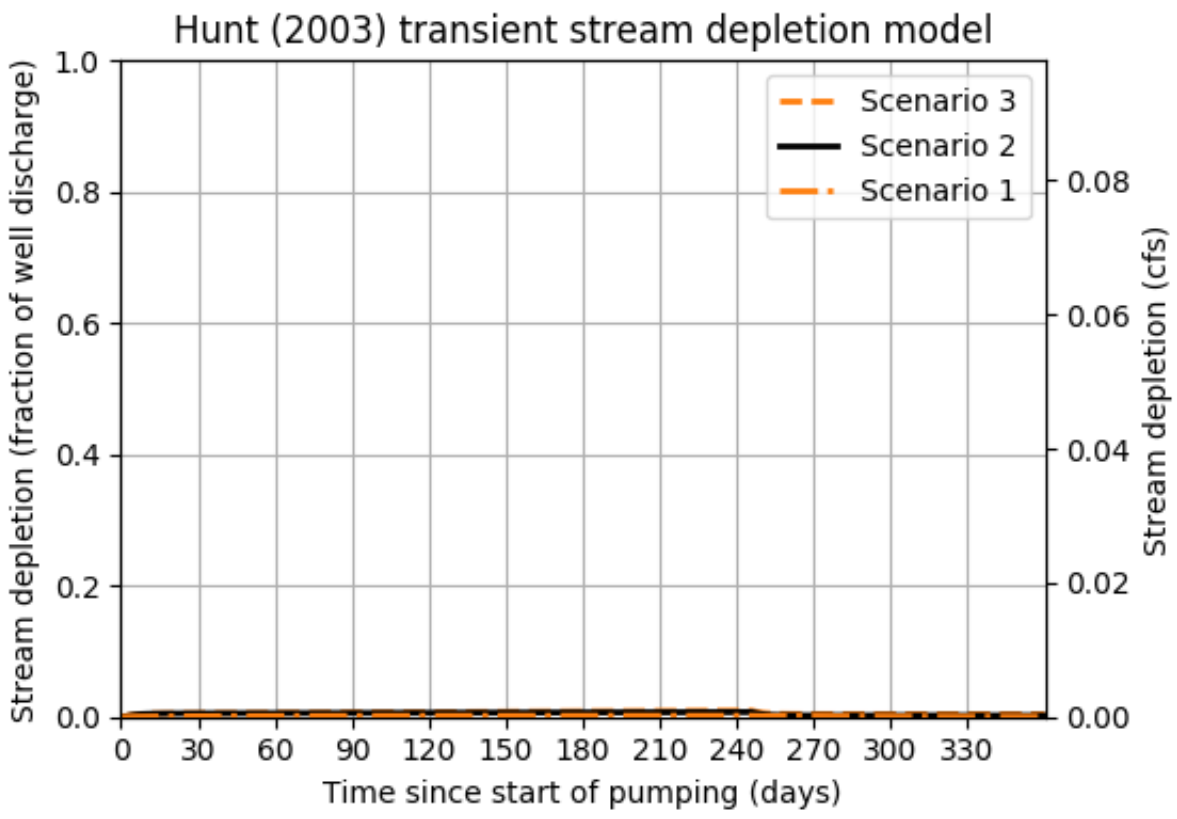
Total pumping time=245 days [irrigation season, March 1-October 31]

Stream Depletion Analysis – SW 1

Application type:	G	Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Application number:	19258	Distance from well to stream	a	1341	1341	1341	ft
Well number:	1	Aquifer transmissivity	T	53.0	387.5	894.0	ft ² /day
Stream Number:	1	Aquifer storativity	S	5e-5	0.001525	0.003	-
Pumping rate (cfs):	0.0978	Aquitard vertical hydraulic conductivity	Kva	0.0001	0.05	0.1	ft/day
Pumping duration (days):	245.0	Aquitard saturated thickness	ba	150.0	150.0	150.0	ft
Pumping start month number (3=March)	3.0	Aquitard thickness below stream	babs	300.0	300.0	300.0	ft
		Aquitard specific yield	Sya	0.2	0.2	0.2	-
		Stream width	ws	80.0	80.0	80.0	ft

Stream depletion for Scenario 2:

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



CLAC 15256 well log

NOTICE TO WATER WELL CONTRACTOR
The original and first copy
of this report are to be
filed with the

CLAC WATER WELL REPORT RECEIVED
STATE OF OREGON
015256
FEB 25 1977
RESOURCES DEPT.

STATE ENGINEER, SALEM, OREGON 97310
within 30 days from the date
of well completion.

State Well No. los/ie 15 da
State Permit No. _____

(1) OWNER:

Name Joseph Schaefer
Address Rt. 1 Molalla, Ore

(2) TYPE OF WORK (check):

New Well Deepening Reconditioning Abandon
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary Driven
Cable Jetted
Dug Bored

(4) PROPOSED USE (check):

Domestic Industrial Municipal
Irrigation Test Well Other

CASING INSTALLED:

6" Diam. from 0 ft. to 28 ft. Gage 250
4" Diam. from 180 ft. to 420 ft. Gage 125

PERFORATIONS:

Type of perforator used skillsaw Perforated? Yes No.
Size of perforations 1/4 in. by 6 in.
200 perforations from 360 ft. to 420 ft.

(7) SCREENS:

Well screen installed? Yes No
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

(8) WELL TESTS:

Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom?
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Air test " " " " " "
Bailer test 13 gal./min. with 240 ft. drawdown after 1 hrs.
Artesian flow Yes No
Temperature of water _____ Depth artesian flow encountered _____ ft.

(9) CONSTRUCTION:

Well seal—Material used Cement
Well sealed from land surface to 20 ft.
Diameter of well bore to bottom of seal 10 in.
Diameter of well bore below seal 6 in.
Number of sacks of cement used in well seal 6 sacks
Number of sacks of bentonite used in well seal _____ sacks
Brand name of bentonite _____
Number of pounds of bentonite per 100 gallons _____ lbs./100 gals.
of water _____
Was a drive shoe used? Yes No Plugs _____ Size: location _____ ft.
Did any strata contain unusable water? Yes No
Type of water? _____ depth of strata _____
Method of sealing strata off _____
Was well gravel packed? Yes No Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

(10) LOCATION OF WELL:

County Clackamas Driller's well number _____
NE 1/4 SE 1/4 Section 15 T. 65 R. 1E W.M.
Bearing and distance from section or subdivision corner _____

(11) WATER LEVEL: Completed well.

Depth at which water was first found 375 ft.
Static level 180 ft. below land surface. Date 2/15/77
Artesian pressure _____ lbs. per square inch. Date _____

(12) WELL LOG:

Diameter of well below casing 6
Depth drilled 420 ft. Depth of completed well 420 ft.
Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Top soil	0	8	
Blue Sandstone	8	85	
Grey " "	85	110	
Blue " "	110	175	
Broken Basalt	175	202	
Blue Sandstone	202	330	
Purple Claystone	330	420	180

E-RECEIVED
MAR 03 2022
OWRD

Work started 2/14 1977 Completed 2/15 1977
Date well drilling machine moved off of well 2/15 1977

Drilling Machine Operator's Certification:

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Robert Meier Date 2/20 1977
(Drilling Machine Operator) 760

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Fricson Drilling Co. Inc.
(Person, firm or corporation) (Type or print)
Address 18075 So. Abies Rd Silverton
[Signed] Robert Meier
(Water Well Contractor)
Contractor's License No. 566 Date 2/20 1977

CLAC 15256 well test report



CB #124606
O BOX 832
ILVERTON, OR 97381

PUMP SALES & SERVICE • FLOW & PURITY TESTING • WATER CONDITIONING

PH 503-873-9287
CL 503-932-3534
STADELIPUMP@AOL.COM

WATER WELL TEST REPORT

E-RECEIVED
MAR 03 2022
OWRD

Date Dec 21-2020 Name John Kraemer

Address _____ Phone # 503-932-5448

Address of well 38670 S. Howlens Bridge Rd Email Kraemer2410@gmail.com

Well Type Irrigation Domestic Other _____

Well casing diameter 6" Height of casing above ground surface 12"

Well depth ? Static Water Level 235' Well vented yes

Sanitary well seal yes Water sample taken yes

Type of sample taken Bacteria Nitrate Arsenic Other _____

Existing system used for flow test yes Flow measuring devise Measured container

Description of pump system 2hp submersible pump with 5 gallon wellhead pressure Tank 1" galvanized pipes

Comments well capacity is more than the pump will pump at this flow well is 420' T.D per well log. Check 015256

Well flow data collected by Eric

Date of flow test Dec 21-2020

TIME	GALLONS PER MIN.	DISCHARGE PRESSURE	STATIC WATER LEVEL	TOTAL GALLONS PUMPED
9:40	12	35	235	0
10:10	12	25	297'6"	360
10:40	12	20	323'	720
11:10	12	20	337'2"	1080
11:40	12	20	342'1"	1440

CLAC 15256 email

From: [Doann Hamilton](#)
Sent: Thursday, April 6, 2023 12:55 PM
To: [GARRISON Stacey L * WRD](#); [BROWN Travis C * WRD](#); [GRAHAM Elisabeth A * WRD](#); [Malia Kupillas](#); kraemerfarms@icloud.com
Subject: Fwd: Static water level for G 19258

Hi Stacey

I am getting back to you about the water level in the domestic well CLAC 15256
- by our client proposed wells for Application G-19258

Stadeli water Systems went back out to read the water level in CLAC 15256
The water level after being off for 12 hours was 240 feet

Let me know if there is something else we can provide for you
Doann Hamilton

----- Forwarded message -----

From: [GARRISON Stacey L * WRD](#) <Stacey.L.GARRISON@water.oregon.gov>
Date: Fri, Mar 31, 2023 at 10:55 AM
Subject: RE: Static water level for G 19258
To: phgdmh@gmail.com <phgdmh@gmail.com>
Cc: [BROWN Travis C * WRD](#) <Travis.C.BROWN@water.oregon.gov>, [GRAHAM Elisabeth A * WRD](#) <Elisabeth.A.GRAHAM@water.oregon.gov>

Hello Doann,

As promised, here is the follow-up email from our phone conversation earlier this morning regarding the static water levels on the well log vs pump test for G-19258. I've cc'd Travis Brown (lead hydrogeologist for southern/central Willamette Basin) and Elisabeth Graham (water rights caseworker) for their visibility. As discussed, a new static water level could refute the 235 ft static water level on the pump test included with the application. Please let us know if you have any questions. Thank you,

Stacey Garrison (*she/hers*)
Hydrogeologist-Groundwater Section
Oregon Water Resources Department
503-551-0205
stacey.l.garrison@water.oregon.gov



Integrity | Service | Technical Excellence | Teamwork | Forward-Looking

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Pacific Hydro-Geology, Inc.
18487 S. Valley Vista Rd.
Mulino, OR 97042
(503) 349-6946
Fax: (503) 632-5983
email: phgdmh@gmail.com