Approved: 

MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager

From: Travis Kelly, Well Construction Compliance Coordinator

Subject: Review of Water Right Application G-19035

Date: February 9, 2022

The attached application was forwarded to the Well Construction and Compliance Section by the Groundwater Section. Stacey Garrison and Travis Brown reviewed the application. Please see Stacy and Travis' Groundwater Review and the Well Report.

Applicant's Well #2 (MARI 66629): Based on a review of the Well Report, Applicant's Well #2 seems to protect the groundwater resource.

The construction of Applicant's Well #2 may not satisfy hydraulic connection issues.

MARI 66629

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

R. Stadeli & Sons
Well & Pump Inc.
4385 Stadeli Lane NE
Silverton, OR 97381

WELL I.D. LABEL# L 121530
START CARD # 213212
ORIGINAL LOG #

(1) LAND OWNER
Owner Well I.D.
First Name Nelson Last Name Kuenzi
Company
Address 10155 Sunnyview Rd NE
City Salem State OR Zip 97317

(2) TYPE OF WORK
[X] New Well [ ] Deepening [ ] Conversion [ ] Alteration (complete 2a & 10) [ ] Abandonment (complete 5a)

(2a) PRE-ALTERATION
SALEM, OR

Casing:	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

Seal:	Material	From	To	Amt	sacks/lbs

DEC 19 2016

(3) DRILL METHOD
[X] Rotary Air [ ] Rotary Mud [ ] Cable [ ] Auger [ ] Cable Mud
[ ] Reverse Rotary [ ] Other

RECEIVED BY OWRD

(4) PROPOSED USE
[ ] Domestic [X] Irrigation [ ] Community
[ ] Industrial/ Commericial [ ] Livestock [ ] Dewatering
[ ] Thermal [ ] Injection [ ] Other

(5) BORE HOLE CONSTRUCTION
Special Standard [ ] (Attach copy)
Depth of Completed Well 345 ft.

BORE HOLE

Dia	From	To
10	0	350

SEAL

Material	From	To	Amt	sacks/lbs
Bentonite	0	6	4	S
		Calculated	2.5	
Cement	6	240	171	S
		Calculated	66	

How was seal placed: Method [ ] A [ ] B [X] C [ ] D [ ] E
[X] Other bent prd & prbd
Backfill placed from 345 ft. to 350 ft. Material native claystone
Filter pack from 244 ft. to 240 ft. Material Packed fine sand & gravel Size
Explosives used: [ ] Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE
Proposed Amount Pounds Actual Amount Pounds

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
●		6	X	15"	345	250	●		X	

Shoe [ ] Inside [X] Outside [ ] Other Location of shoe(s) 345
Temp casing [X] Yes Dia 10 From 1' To 10'

(7) PERFORATIONS/SCREENS
Perforations Method swift factory
Screens Type Material

Perf/Screen	Casing/Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/pipe size
Perf	Casing	6	245	345	.125	4	2,280	6

(8) WELL TESTS: Minimum testing time is 1 hour
(●) Pump ( ) Bailer ( ) Air ( ) Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
240	55	240	4

Temperature 56 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount 160

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)
County MARION Twp 7 S N/S Range 1 W E/W WM
Sec 19 NW 1/4 of the NE 1/4 Tax Lot 300
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
(●) Street address of well ( ) Nearest address
10155 Sunnyview Rd NE

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	12-06-2016		−	87.3

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 8'

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
	8	10	8			
	65	74	4			
	104	110	3			
	147	162	35			
12-06-2016	245	345	240		−	87.3

(11) WELL LOG
Ground Elevation

Material	From	To
soil	0	1
clay brown	1	5
clay yellow	5	7
soft brown rock	7	10
basalt weathered turning grey	10	20
basalt grey hard	20	30
basalt grey hard with fractures	30	35
basalt grey hard	35	68
basalt black porous medium with white crystals	65	74
basalt grey hard	74	78
basalt grey fractured	78	97
clay green	97	100
claystone grey	100	104
basalt black porous	104	110
basalt dark grey med hard	110	120
basalt grey hard	120	147
very soft very weathered rock	147	162
brown & yellow	147	162
basalt grey with brown fractured	162	168

Date Started 11-17-2016 Completed 12-06-2016

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
License Number 1358 Date 12-9-16
Signed

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
License Number 688 Date 12/13/16
Signed Steven N. Stadeli
Contact Info (optional)

ORIGINAL - WATER RESOURCES DEPARTMENT
THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK Form Version: 0.95

MARI 66629

MARI 66629

WATER SUPPLY WELL REPORT - continuation page

R. Stadeli & Sons
Well & Pump Inc.
4385 Stadeli Lane NE
Silverton, OR 97381

WELL I.D. LABEL# L 121530
START CARD # 213212
ORIGINAL LOG #

(2a) PRE-ALTERATION

Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

Material	From	To	Amt	sacks/lbs

Water Quality Concerns

From	To	Description	Amount	Units

(5) BORE HOLE CONSTRUCTION

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/lbs
					Calculated		
					Calculated		
					Calculated		
					Calculated		

FILTER PACK

From	To	Material	Size

(10) STATIC WATER LEVEL

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)

(11) WELL LOG

Material	From	To
basalt grey hard	168	192
basalt grey med hard with fractures	192	205
basalt grey with brown some weathered	205	218
basalt grey with brown porous	218	230
basalt grey med hard	230	255
basalt grey fractured semi vesicular	255	283
claystone blue green	283	300
claystone black & brown	300	302
basalt grey hard with fractures	302	345
siltstone green	345	348
clay blue	348	350

RECEIVED BY OWRD
DEC 19 2016
SALEM, OR

RECEIVED BY OWRD
SALEM, OR

(6) CASING/LINER

Casing Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd

(7) PERFORATIONS/SCREENS

Perf/Screen	Casing/Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/pipe size

(8) WELL TESTS: Minimum testing time is 1 hour

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)

Comments/Remarks

6x10 shale trap installed @ 245 ft.
packer of gravel & fine sand 240-245 ft
seal from 240' to land surface

Groundwater Application Review Summary Form

Application # G- 19035

GW Reviewer Stacey Garrison/Travis Brown Date Review Completed: 12/23/2021

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 **_December 23 2021_**

TO: **Application** G-**_19035_**

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 12/23/2021
FROM: Groundwater Section Stacey Garrison/Travis Brown
Reviewer's Name
SUBJECT: Application G- **19035** 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: **Nelson Kuenzi** County: **Marion**

A1. Applicant(s) seek(s) 0.298 cfs from 1 well(s) in the Willamette Basin, Molalla-Pudding subbasin

A2. Proposed use irrigation Seasonality: Mar 1-Oct 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	**MARI 66629**	2	**CRB**	0.298	7S/1W-19 NW-NE	1065' S, 1795' W fr NE cor S19*

* 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	283.54 **	8	87.17	3/11/2020	345	0-240	0-345		PRF 245-345	240	55	Pump

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU are ~ 6 miles east of Salem. Applicant proposes to irrigate up to 23.8 acres with the maximum annual volume of 59.5 af, based on the maximum allowed duty of 2.5 af/acre. The proposed POA (MARI 66629) is also an authorized POA for Irrigation Use on 27.4 acres at a maximum rate of 0.34 cfs and a maximum annual volume of 68.5 af under **Cert 95358** (priority date Feb 6 2015).
T-13687 issued on Sep 2 2021 on **Cert 95358 and Cert 95541**, POU and POA temporary transfer through 31 October 2025. Cert 95358: transfer of 0.09 cfs on 7.4 ac; Cert 9554:1transfer of 0.07 cfs (0.01 cf from well 1 and 0.06 cfs from well 2) on 7.9 ac. Transfer to 7.9 ac and 7.4 ac at 7S 1W-18; transfer POA for Cert 95541 to MARI 66629. Additional withdrawal rate of 0.07 cfs from MARI 66629 for 7.9 ac with a maximum annual volume of 19.75 af under T-13687. The proposed POA will therefore be assessed at a total combined rate of **0.708 cfs (~317.8 gpm)** and a **maximum annual volume of 147.75 af**.
NOTE: T-13687was issued for the proposed POA and a portion of the POU on September 21 2021 and expires October 31 2025. If a permit is issued pursuant to this application, T-13687 should be cancelled to prevent the user from exceeding the applicable duty (2.5 af/acre).
NOTE: Certificate 23156 (surface water) was issued for a portion of the proposed POU with a priority date of August 21 1951. Applicant indicates in Section 10 of application form intent to diminish Certificate 23156. If a permit is issued pursuant to this application, Certificate 23156 should be cancelled to prevent the user from exceeding the applicable duty (2.5 af/acre).
*Metes and bounds description is ~78 feet southeast of well location as recorded in OWRD database. The Department-projected location will be used for this review.
**Well elevation data from LiDAR ground surface elevation (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 POA is less than ¼-mile from the nearest surface water source, but will develop a confined aquifer; 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:

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) **7i (Willamette Basalt Condition), 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 **Columbia River Basalt** 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. **Special Conditions:**

1. Each basalt well shall be cased and continuously sealed from land surface to a depth of at least 50 feet to preclude hydraulic connection to nearby streams.

2. Any well added to or deepened under this or subsequent permits shall be open to a single aquifer of the Columbia River Basalt Group and shall meet the applicable well construction standards (OAR 690-200 and OAR 690-210). In addition, the open interval in each well shall be no greater than 100 feet. An open interval of greater than 100 feet may be allowed if substantial evidence of a single aquifer completion can be demonstrated to the satisfaction of the Department Hydrogeologists, using information from a video log, downhole flowmeter, water chemistry and temperature, or other downhole geophysical methods. These methods shall characterize the nature of the basalt rock and assess whether water is moving in the borehole. Any discernable movement of water within the well bore when the well is not being pumped shall be assumed as evidence of the presence of multiple aquifers in the open interval. If during well construction, it becomes apparent that the well can be constructed to eliminate interference with hydraulically connected streams in a manner other than specified in this permit, the permittee can contact the Department Hydrogeologist for this permit or the Ground Water/Hydrology Section Manager to request approval of such construction. The request shall be in writing, and shall include a rough well log and a proposed construction design for approval by the Department. The request can be approved only if it is received and reviewed prior to placement of any permanent casing and sealing material. If the request is made after casing and seal are placed, the requested modification will not be approved. If approved, the new well depth and construction specifications will be incorporated into any certificate issued for this permit.

3. For any well constructed under this or subsequent permits, a dedicated water-level measuring tube shall be installed in each well. The measuring tube shall meet the standards described in OAR 690-215-0060. When requested, access to the wells shall be provided to Department staff in order to make water-level measurements.

4. For any wells constructed or deepened under this or subsequent permits, the applicant shall coordinate with the driller to ensure that drill cuttings are collected at 10 ft intervals and at changes in formation in each well. A split of each sampled interval shall be provided to the Department.

5. If any geologic and hydrogeologic reports are completed for the permittee during the development of permitted wells, including geophysical well logs and borehole video logs, then copies of the reports shall be provided to the Department. Except for borehole video logs, two paper copies, or a single electronic copy, shall be provided of each report. Digital tables of any data shall be provided upon request.

Groundwater availability remarks: Groundwater for the proposed use cannot be determined to be over-appropriated due to insufficient available data regarding rates of recharge and the current quantity of groundwater withdrawals from the aquifer system.
The POA (MARI 66629) utilizes a water-bearing zone within the Columbia River Basalt Group (CRBG); aquifers in the CRBG are typically thin interflow zones between lava flows and confined by thicker flow interiors that have low porosity and low permeability (Conlon et al 2005, Gannet and Caldwell 1998, Reidel et al 2002). Comparison of the POA well log with local lithology indicates the POA likely utilizes water from either the Sentinel Bluffs member or the Winter Water member of the Grand Ronde Basalt (Tolan et al 1999). The POA is located in the Waldo Hills area, which is deformed by northwest and northeast trending faults, possibly resulting in compartmentalization of aquifers (Tolan et al 1999). There is a northwest trending fault located 0.54 miles east of the POA, and another similarly trending fault located 0.96 miles to the SW of the POA (Tolan et al 1999). The degree of compartmentalization due to nearby faults, which is unknown at this time, may exacerbate well-to-well interference and longer-term water level declines in the local basalt aquifer.
Existing rate from Cert 95358 is 0.34 cfs. Temporary additional rate from T 13687 is 0.07 cfs. If all authorizations are utilized, total pumping rate is 0.708 cfs, or ~317.8 gpm. A review of statistics for nearby well records was completed and compared with the proposed rate of 0.708 cfs (317.8 gpm) for this application (see Well Statistics 7S/1W S19 S18 S19 & S20). There is some uncertainty regarding the ability of the groundwater resource to sustain the proposed use of 0.708 cfs (~317.8 gpm); median reported well yield is 40 gpm, however, the proposed rate is significantly less than the maximum reported yield of 1,000 gpm. The proposed rate for this application is 795 percent of the median, and 32 percent of the maximum reported yield.
The nearest groundwater user (MARI 18030, an exempt domestic well) is ~600 feet northwest of the POA, at an elevation of ~274 ft msl. The well log does not record the latitude or longitude for MARI 18030, but it is recorded to be located on taxlot 400 at 10075 Sunnyview Road. Due to the domestic use indicated on the well log, it was assumed that MARI 18030 is co-located in the vicinity of the developed structures on taxlot 400 at 10075 Sunnyview Road. MARI 18030 is completed to a depth of 208 ft bls and has an open annular space of 85-208 ft bls (66-189 ft mls). The seal of the POA extends to ~43.5 ft msl, likely not sealing through the water-bearing zone that MARI 18030 is utilizing. It is likely the proposed use would cause some degree of well-to-well interference with MARI 18030. To assess the degree of drawdown, a Theis drawdown analysis was conducted for the proposed use (see attached Theis Drawdown Analysis). Results indicate that the proposed use is not likely to cause well-to-well interference with MARI 18030 that exceeds the threshold under the standard condition for basalt aquifers in the Willamette Basin. Based on this analysis of the available data and under the assumptions previously identified, groundwater for the proposed use **will likely be available in the amounts requested and within capacity of the resource; however, the conditions specified in B1.d. are strongly 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
2	**CRB**	☒	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: SWL reported for last 5 years between 84 and 88 ft bsl (elevation of ~195 to 200 ft msl). MARI 66629 well log reports Hard Gray Basalt from 168 to 192 ft bsl, indicating 24 feet of confining layer reaching up to 168 ft bsl (elevation of ~116 to 92 ft msl). The SWL is ~80 ft above the overlying confining layer (Hard Gray Basalt),

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
2	**1**	**Unnamed tributary Pudding River**	**195-200**	**250-270**	**711**	☐	☒	☐	☐	☒
2	**2**	**Unnamed tributary Pudding River**	**195-200**	**190-220**	**2,954**	☐	☒	☐	☐	☒
2	**3**	**Pudding River**	**195-200**	**164-182**	**~3,065**	☐	☒	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: MARI 66629 is continuously sealed into hard dense basalt at an elevation of around 43.5 ft msl with a water-bearing zone at ~38.5 ft msl to -61.5 ft msl, and static water level of ~195-200 ft msl. The local streambeds are around 160 to 270 ft msl in elevation. The nearby surface water sources do not appear to have incised through the confining layer (Hard Gray Basalt) overlying the water-bearing zone. The aquifer utilized by the POA should be isolated from overlying local streams.

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

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?
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: No hydraulically connected surface water sources were identified within 1 mile of the proposed POA.

C4a. **690-09-040 (5):** Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
Distributed Wells Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.													
(B) = 80 % Nat. Q													
(C) = 1 % Nat. Q													
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		%	%	%	%	%	%	%	%	%	%	%	%

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

Basis for impact evaluation: _____

C4b. **690-09-040 (5) (b) The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.**

C5. ☐ **If properly conditioned**, the surface water source(s) can be adequately protected from interference, and/or groundwater use under this permit can be regulated if it is found to substantially interfere with surface water:

i. ☐ The permit should contain condition #(s)_____;

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

C6. **SW / GW Remarks and Conditions:** No hydraulically connected surface water sources were identified within 1 mile of the proposed POA.

References Used:

Application File: G-19035, T-13687

Water Well reports: MARI 66629, MARI 18030, MARI 6334, MARI 6335

Pumping Test reports: MARI 6153, MARI 6333, MARI 7003, MARI 9942, MARI 9943, MARI 11337, MARI 15392, MARI 17772, MARI 50626, MARI 53068, MARI 66629

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.

Gannett, M.W. and Caldwell, R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A, 32 p.

Reidel, S.P., Johnson, V.G., and Spane, F.A., 2002, Natural gas storage in basalt aquifers of the Columbia Basin, Pacific Northwest USA—A guide to site characterization: Richland, Wash., Pacific Northwest National Laboratory, 277 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 groundwater storage, American Geophysical Union Transactions, vol. 16, p. 519-524.

Tolan, Terry L. and Beeson, Marvin H., 1999, Geologic Map of the Stayton NE 7.5 Minute Quadrangles, Northwest Oregon: A Digital Database: USGS Open File Report 99-141.

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

United States Geological Survey, 2017, Stayton NE quadrangle, Oregon [map], 1:24,000, 7.5 minute topographic series, U.S. Department of the Interior, Reston, Virginia.

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:** _____

_____

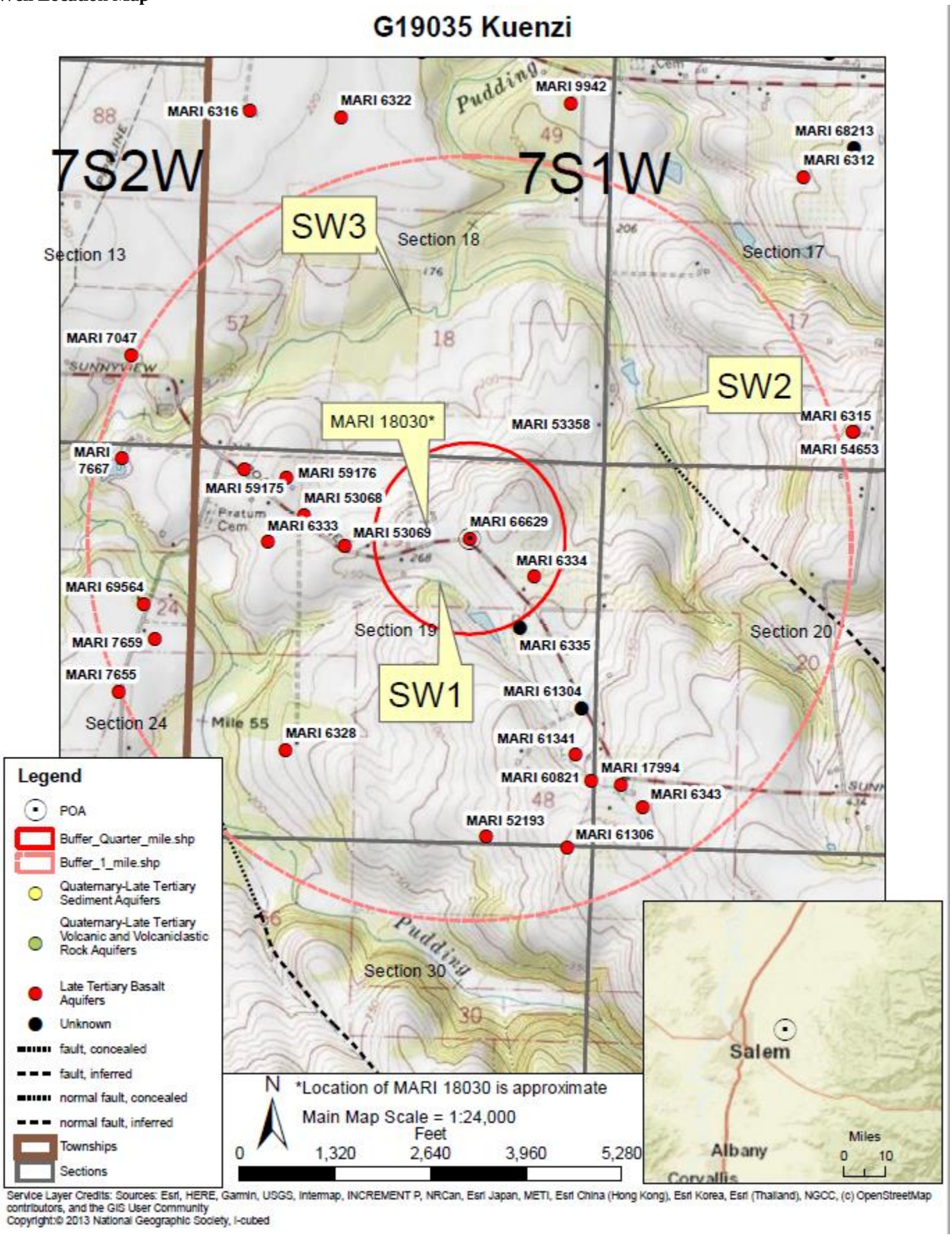
_____

_____

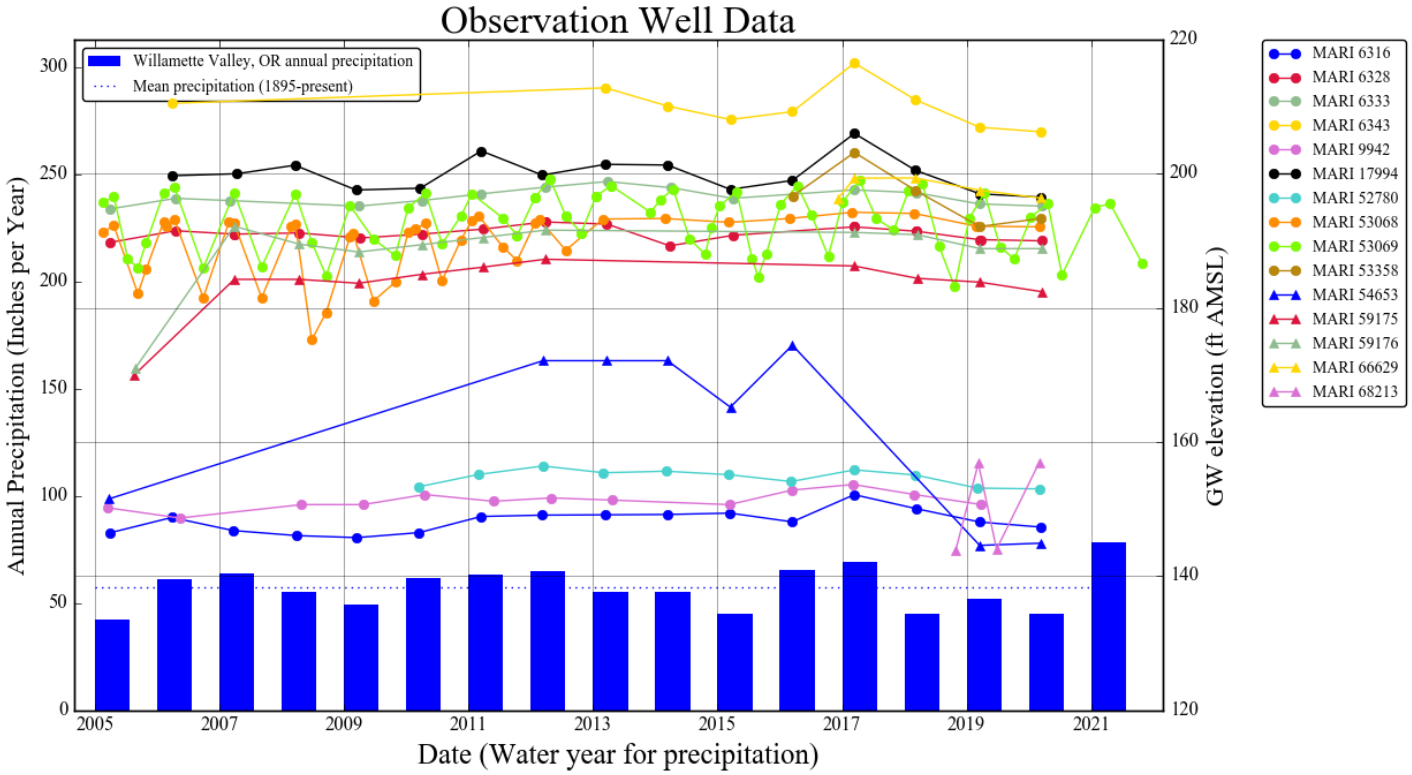
_____

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

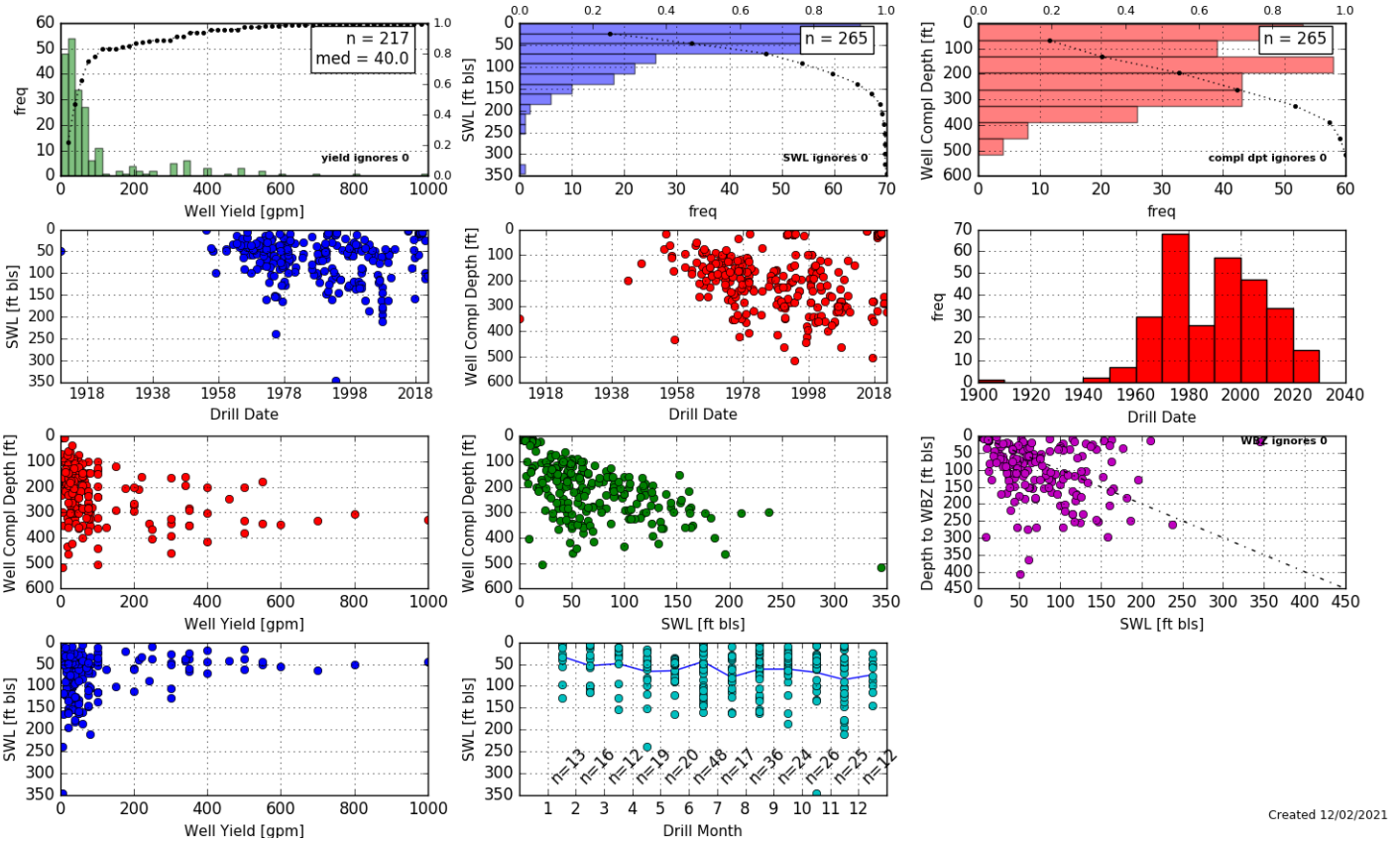
Well Location Map



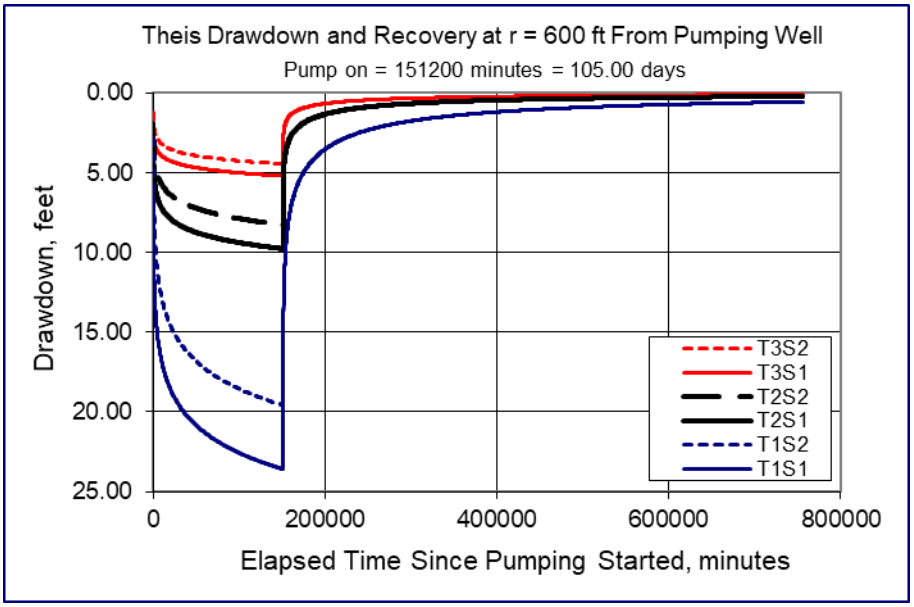
Water-Level Measurements in Nearby Wells



Well Statistics 7S/1W S19 S18 S19 & S20



Theis Drawdown Analysis



Radial distance from pumping well (r)=600 ft [estimated radial distance to nearest user, MARI 18030]

Pumping Rate (Q)= 0.708 cfs (317.75 gpm) [proposed rate]

Aquifer Transmissivity (T1)= 14,586 gpd/ft (1,950 ft^2/day), (T2)= 38,896 gpd/ft (5,200 ft^2/day), (T3)= 77,977 gpd/ft (10,424 ft^2/day)

Storativity (s1) = 1 X 10^{-4}, (s2) = 5 X 10^{-4} [Conlon et al 2005, Table 2 values for Central CRB]

Total pumping time = 105 days*

*The full pumping rate could not be utilized continuously for the entire 245-day irrigation season without exceeding the 147.75 ac-ft maximum allowed duty. For the maximum allowed duty of 147.75 ac-ft at 0.708 cfs, continuous pumping would occur for approximately 105 days.