

Groundwater Application Review Summary Form

Application # G- 18690

GW Reviewer J. Woody Date Review Completed: 1-23-2019

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.

or 1/31/19

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).

MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager
From: Joel Jeffery, Well Construction Program Coordinator
Subject: Review of Water Right Application G-18690
Date: March 14, 2019

The attached application was forwarded to the Well Construction and Compliance Section by Water Rights. Jen Woody reviewed the application. Please see Jen's Groundwater Review and the Well Logs.

Applicant's Well POA3 (MARI 1243): Based on a review of the Well Report, Applicant's Well POA3 does not appear to comply with current minimum well construction standards (See OAR 690 Division 210). The Well Report indicates that the top terminal height of the well casing is at land surface. In order to meet the minimum well construction standards, the top terminal height of the Water Supply Well must be at least one foot above land surface, the pump house floor or the local surface run off level.

My recommendation is that the Department **not issue** a permit for Applicant's Well POA3 (MARI 1243) unless it is brought into compliance with current minimum well construction standards or information is provided showing that it is in compliance with current minimum well construction standards.

Bringing Applicant's Well POA3 (MARI 1243) into compliance with minimum well construction standards may not satisfy hydraulic connection issues.

Applicant's Well POA4 (MARI 1337 and MARI 1336 the reconditioning of MARI 1337): Based on a review of the Well Reports, Applicant's Well POA4 does not appear to comply with current minimum well construction standards (See OAR 690 Division 210). The Well Report indicates that the top terminal height of the well casing is at land surface. In order to meet the minimum well construction standards, the top terminal height of the Water Supply Well must be at least one foot above land surface land surface, the pump house floor or the local surface run off level. In addition, the well report (MARI 1337) does not describe an annular seal for the 8-inch diameter gravel feed tube placed two feet west of the 12-inch diameter casing.

My recommendation is that the Department **not issue** a permit for Applicant's Well POA4 (MARI 1337 and MARI 1336 the reconditioning of MARI 1337) unless it is brought into compliance with current minimum well construction standards or information is provided showing that it is in compliance with current minimum well construction standards.

Bringing Applicant's Well POA4 (MARI 1337 and MARI 1336 the reconditioning of MARI 1337) into compliance with minimum well construction standards may not satisfy hydraulic connection issues.

Applicant's Well POA7 (MARI 1221): Based on a review of the Well Report, Applicant's Well POA7 does not appear to comply with current minimum well construction standards (See OAR 690 Division 210). The Well Report indicates that the top terminal height of the well casing is at land surface. In order to meet the minimum well construction standards, the top terminal height of the Water Supply Well must be at least one foot above land surface, the pump house floor or the local surface runoff level. The report also indicates that the constructor received approval from the Department for the sealing method, so that portion of the construction will not be reviewed.

My recommendation is that the Department **not issue** a permit for Applicant's Well POA7 (MARI 1221) unless it is brought into compliance with current minimum well construction standards or information is provided showing that it is in compliance with current minimum well construction standards.

Bringing Applicant's Well POA7 (MARI 1221) into compliance with minimum well construction standards may not satisfy hydraulic connection issues.

Applicant's Well POA8 (MARI 1441): Based on a review of the well report, Applicant's Well POA8 seems to protect the groundwater resource.

The construction of Applicants Well POA8 may not satisfy hydraulic connection issues.

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 1/23/2019
 FROM: Groundwater Section Jen Woody
 Reviewer's Name
 SUBJECT: Application G- 18690 Supersedes review of n/a
 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: C & E Brentano Family LP County: Marion

A1. Applicant(s) seek(s) 9.7 cfs from 4 well(s) in the Willamette Basin,
Middle Willamette/Champoeg subbasin

A2. Proposed use Irrigation(0.95 cfs), Nursery (7.38 cfs), Deficiencies in Rates (1.37 cfs) Seasonality: _____

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 1243	POA3	Alluvium	9.22	4S/2W-20 SW ¼ SE ¼	490' S, 2230' W fr NW cor Leard DLC 95
2	MARI 1337/1336	POA4	Alluvium	9.22	4S/2W-29 NW ¼ NE ¼	1840' S, 3270' E fr NW cor Servant DLC 94
3	MARI 1221	POA7	Alluvium	9.22	4S/2W-19 SE ¼ SE ¼	1070' N, 30' W fr NE cor Sauve DLC 62
4	MARI 1441	POA8	Alluvium	0.51	4S/3W-24 SW ¼ NW ¼	1060' N, 30' E fr W ¼ cor S 24

* 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	173	unk	20	4/27/1965	155	0-20	0-18	n/a	n/a	480	26	pump
2	170	unk	34	6/20/1967	159	0-20	0-158.5	n/a	118.5-158.5	1500	84	pump
3	172	unk	64	7/11/1968	172	0-20	0-174	n/a	104-164	1500	62	pump
4	114	unk	31	1/2/1976	203	0-62	0-205.5	n/a	106.5-188	unk	unk	unk

Use data from application for proposed wells.

A4. **Comments:** There are multiple uses and rates associates with each well, see Section C3b for details.

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 wells will produce from a confined aquifer, therefore the pertinent rules (OAR 690-502-240) do not apply.

A6. **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.

Name of administrative area: _____

Comments: N/A

B. GROUNDWATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. **Based upon available data**, I have determined that groundwater* for the proposed use:

- a. is over appropriated, is not over appropriated, or cannot be determined to be over appropriated during any period of the proposed use. * This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;
- b. will not or will likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;
- c. will not or will likely to be available within the capacity of the groundwater resource; or
- d. will, if properly conditioned, avoid injury to existing groundwater rights or to the groundwater resource:
 - i. The permit should contain condition #(s) 7n, Large Water Use Reporting;
 - ii. The permit should be conditioned as indicated in item 2 below.
 - iii. The permit should contain special condition(s) as indicated in item 3 below;

- B2. a. **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;
- b. **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;
- c. **Condition** to allow groundwater production only from the alluvial groundwater reservoir between approximately _____ ft. and _____ ft. below land surface;
- d. **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): _____

B3. **Groundwater availability remarks:** _____

The proposed wells are located on a terrace about 70 feet above the floodplain of the Willamette River. The terrace is underlain by a thick sequence of fine-grained sediments that extends to depths of approximately 1000 feet. The bulk of the sediments are clays and silts that encase a few relatively thin beds of sand and gravel that do not appear to be continuous over widespread areas. The upper 80-100 feet of sediments are a sequence of graded beds of fine sand, silt, and clay (the Willamette Silt) deposited by a series of Pleistocene glacial floods which inundated the Willamette Valley. The water table occurs at shallow depths within the Willamette Silt, which acts as a leaky confining layer for productive sands and gravel at depth. Thin zones of sands and gravels are likely the primary water bearing units. The thin, discontinuous geometry and confined conditions suggest that the aquifer system could be vulnerable to long term drawdown and/or interference.

Well yield in 4S/2W-19, 20, 29, 30 ranges from 20 to 1620 gpm, with a median yield of 100 gpm. The requested rates of 9.2 cfs (4,140 gpm) for wells 1/MARI 1243, 2/MARI 1337, and 3/ MARI 1221 may be possible as a combined rate of the proposed POAs.

Water level data from state observation well MARI 2331 indicates seasonal fluctuations of about 20 feet, but relatively stable conditions over the last 50 years for shallow wells (see hydrograph in Fig. 3). The thin, lenticular geometry of the water-bearing zones and the large proposed rate indicate that water-use reporting and water-level measurement conditions are prudent (Conlon and others, 2005).

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	Alluvial	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Alluvial	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Alluvial	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Alluvial	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: Water-bearing sands and gravels in the area are overlain by 80 to 100 feet of saturated Willamette Silt. The water table occurs at depths of less than 50 feet within the silt unit, whereas water bearing zones are typically below 100 ft bld. The available data indicates the silt unit acts as a leaky confining unit for sands and gravels at depth.

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?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Mission Creek	130-140	130-140	3450	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Mission Creek	130-140	130-140	4300	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	1	Mission Creek	130-140	130-140	1140	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	2	Horseshoe Lake	90-100	80-90	2450	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	3	Unnamed tributary to Willamette River	90-100	100	2630	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: Mission Creek has its headwaters in the terrace underlain by the Willamette Silt. As these stream drainages traverse the terrace toward the northeast, they progressively cut into the Willamette Silt until they intersect the water table, at which point they transition from ephemeral to perennial streams. This is consistent with published water level maps which indicate that groundwater in the alluvial aquifer system flows toward and discharges into the local stream network (Woodward and others, 1998). These facts indicate that the alluvial aquifer system is hydraulically connected to the local stream network. The depletion of local streams on the terrace by the proposed wells will be buffered, but not eliminated, by the low vertical hydraulic conductivity of the Willamette Silt and other clays and silts that lie above the deeper sands and gravels.

Water Availability Basin the well(s) are located within: Well #4 is in Watershed ID #182: WILLAMETTE R > COLUMBIA R - AB MOLALLA R; Wells 1, 2 & 3 are in Watershed ID #30200708: Champoeg Creek > Willamette

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 source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and 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"/>	none	n/a	<input type="checkbox"/>	1.00	<input checked="" type="checkbox"/>	<25%	<input checked="" type="checkbox"/>
2	1	<input type="checkbox"/>	<input type="checkbox"/>	none	n/a	<input type="checkbox"/>	1.00	<input checked="" type="checkbox"/>	<25%	<input checked="" type="checkbox"/>
3	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	none	n/a	<input type="checkbox"/>	1.00	<input checked="" type="checkbox"/>	<25%	<input checked="" type="checkbox"/>
4	2	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	3830	<input type="checkbox"/>	<25%	<input type="checkbox"/>
4	3	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	3830	<input type="checkbox"/>	<25%	<input type="checkbox"/>

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.

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"/>	none	n/a	<input type="checkbox"/>	1.00	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
2	1	<input type="checkbox"/>	<input type="checkbox"/>	none	n/a	<input type="checkbox"/>	1.00	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
3	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	none	n/a	<input type="checkbox"/>	1.00	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
4	2	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	3830	<input type="checkbox"/>		<input type="checkbox"/>
4	3	<input type="checkbox"/>	<input type="checkbox"/>	n/a	n/a	<input type="checkbox"/>	3830	<input type="checkbox"/>		<input type="checkbox"/>

Comments: The application has distributed rates for the four wells as follows:

Well 1/MARI 1243/POA3: 360 gpm irrigation, 3321 gpm nursery, 459 deficiency in rate

Well 2/MARI 1337/POA4: 360 gpm irrigation, 3321 gpm nursery, 459 deficiency in rate

Well 3/MARI 1221/POA7: 360 gpm irrigation, 3321 gpm nursery, 459 deficiency in rate

Well 4/MARI 1441/POA8: 72 gpm irrigation, 158 gpm deficiency in rate

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												
		%	%	%	%	%	%	%	%	%	%	%	%
	Well Q as CFS												
	Interference CFS												
		%	%	%	%	%	%	%	%	%	%	%	%
	Well Q as CFS												
	Interference CFS												
		%	%	%	%	%	%	%	%	%	%	%	%
	Well Q as CFS												
	Interference CFS												
	(A) = Total Interf.												
	(B) = 80 % Nat. Q												
	(C) = 1 % Nat. Q												

D. WELL CONSTRUCTION, OAR 690-200

D1. Well #: _____ Logid: n/a

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.**

Figure 1. Water Availability Tables

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION
 Water Availability as of 3/11/2005 for
 CHAMPOEG CR > WILLAMETTE R - AT MOUTH

Watershed ID #: 30200708 Basin: WILLAMETTE Exceedance Level: 80
 Time: 08:37 Date: 03/11/2005

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	6.59	0.00	30.70	0.00	0.00	30.70
2	51.70	6.11	0.00	45.60	0.00	0.00	45.60
3	22.40	3.06	0.00	19.30	0.00	0.00	19.30
4	10.90	1.88	0.00	9.02	0.00	0.00	9.02
5	6.15	3.87	0.00	2.28	0.00	0.00	2.28
6	3.04	6.45	0.00	-3.41	0.00	0.00	-3.41
7	2.94	10.60	0.00	-7.65	0.00	0.00	-7.65
8	1.88	8.41	0.00	-6.53	0.00	0.00	-6.53
9	1.08	4.11	0.00	-3.03	0.00	0.00	-3.03
10	1.00	0.30	0.00	0.70	0.00	0.00	0.70
11	10.10	3.74	0.00	6.36	0.00	0.00	6.36
12	47.80	9.46	0.00	38.30	0.00	0.00	38.30
Stor	28100	3910	0	25100	0	0	25100

Water Availability Analysis Detailed Reports

WILLAMETTE R > COLUMBIA R - AB MOLALLA R WILLAMETTE BASIN

Water Availability as of 1/22/2019

Watershed ID #: 182 ([Map](#))

Exceedance Level:80%

Date: 1/22/2019

Time: 11:12 AM

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	21,400.00	2,290.00	19,100.00	0.00	1,500.00	17,600.00
FEB	23,200.00	7,470.00	15,700.00	0.00	1,500.00	14,200.00
MAR	22,400.00	7,250.00	15,200.00	0.00	1,500.00	13,700.00
APR	19,900.00	6,900.00	13,000.00	0.00	1,500.00	11,500.00
MAY	16,600.00	4,240.00	12,400.00	0.00	1,500.00	10,900.00
JUN	8,740.00	1,970.00	6,770.00	0.00	1,500.00	5,270.00
JUL	4,980.00	1,800.00	3,180.00	0.00	1,500.00	1,680.00
AUG	3,830.00	1,650.00	2,180.00	0.00	1,500.00	684.00
SEP	3,890.00	1,390.00	2,500.00	0.00	1,500.00	998.00
OCT	4,850.00	745.00	4,100.00	0.00	1,500.00	2,600.00
NOV	10,200.00	878.00	9,320.00	0.00	1,500.00	7,820.00
DEC	19,300.00	960.00	18,300.00	0.00	1,500.00	16,800.00
ANN	15,200,000.00	2,250,000.00	13,000,000.00	0.00	1,090,000.00	11,900,000.00

Figure 2. Well Location Map

G18690
T4S/R2W-Section 19, 20, 29; T4S/R3W-Section 24

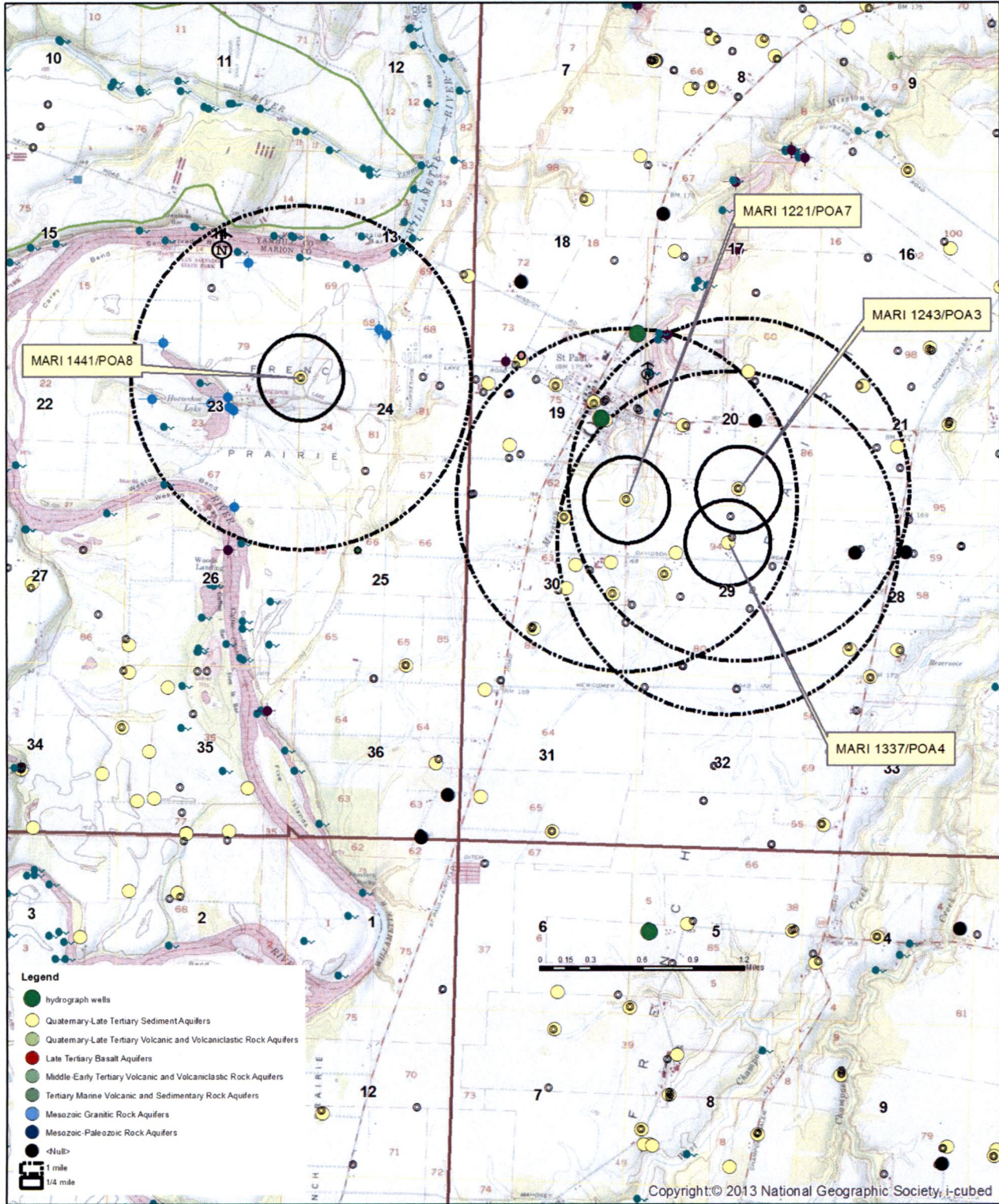
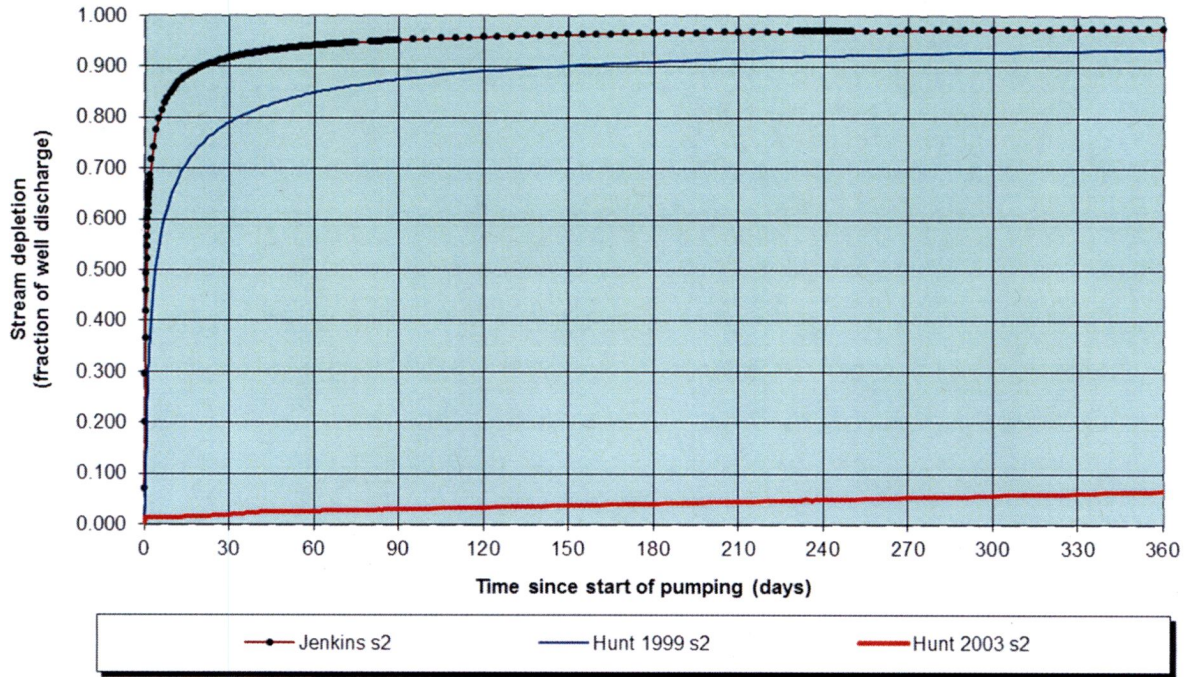


Figure 3. Stream depletion POAs 1,2,3 and Mission Creek

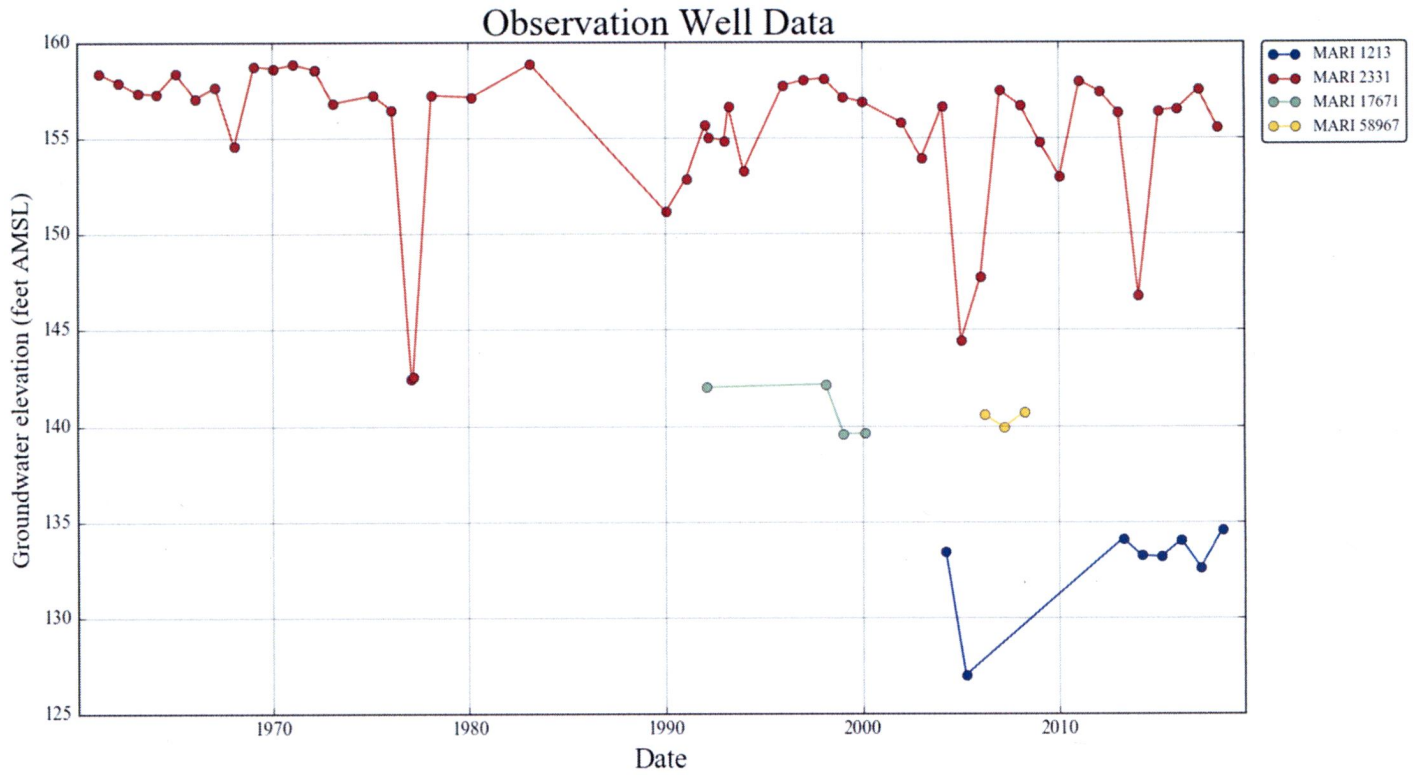
Transient Stream Depletion (Jenkins, 1970; Hunt, 1999, 2003)



Output for Stream Depletion, Scenario 2 (s2):					Time pump on (pumping duration) = 360 days							
Days	30	60	90	120	150	180	210	240	270	300	330	360
J SD	91.7%	94.1%	95.2%	95.8%	96.3%	96.6%	96.8%	97.0%	97.2%	97.4%	97.5%	97.6%
H SD 1999	79.1%	84.9%	87.5%	89.1%	90.2%	91.0%	91.6%	92.1%	92.6%	92.9%	93.2%	93.5%
H SD 2003	1.93%	2.64%	2.98%	3.34%	3.73%	4.08%	4.51%	4.89%	5.33%	5.74%	6.13%	6.59%
Qw, cfs	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400
H SD 99, cfs	5.851	6.283	6.478	6.595	6.675	6.734	6.781	6.818	6.849	6.875	6.898	6.918
H SD 03, cfs	0.143	0.195	0.221	0.247	0.276	0.302	0.334	0.362	0.395	0.425	0.453	0.488

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	3321.00	3321.00	3321.00	gpm
Time pump on (pumping duration)	tpon	360	360	360	days
Perpendicular from well to stream	a	1140	3450	4300	ft
Well depth	d	125	125	125	ft
Aquifer hydraulic conductivity	K	1.29	12.9	129	ft/day
Aquifer saturated thickness	b	140	140	140	ft
Aquifer transmissivity	T	180.6	1806	18060	ft*ft/day
Aquifer storativity or specific yield	S	0.0001	0.0001	0.0001	
Aquitard vertical hydraulic conductivity	Kva	0.1	0.1	0.1	ft/day
Aquitard saturated thickness	ba	90	90	90	ft
Aquitard thickness below stream	babs	3	3	3	ft
Aquitard porosity	n	0.2	0.2	0.2	
Stream width	ws	20	20	20	ft

Figure 4. Water-Level Trends in Nearby Wells



MARI 1243

NOTICE TO WATER WELL CONTRACTOR

The original and first copy of this report are to be filed with the

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

MARI 1243 RECEIVED MAY 5 1965

RECEIVED MAY 10 1965

Well No. 4/2w-20

STATE ENGINEER SALEM, OREGON

(1) OWNER: STATE ENGINEER SALEM, OREGON

Name: Ed Brentano Address: 2435 N. ...

(2) LOCATION OF WELL: App# 3088

County: Marion Driller's well number: SW 1/4 SE 1/4 Section 20 T. 4.5 R. 2W W.M.

Bearing and distance from section or subdivision corner: Cor. 260' and West 2166' of NE cor of Larvath DLE

(3) TYPE OF WORK (check): New Well [X] Deepening [] Reconditioning [] Abandon []

Domestic [] Industrial [] Municipal [] Irrigation [X] Test Well [] Other []

(4) PROPOSED USE (check): Domestic [] Industrial [] Municipal [] Irrigation [X] Test Well [] Other []

(5) TYPE OF WELL: Rotary [] Driven [] Cable [X] Jetted [] Dug [] Bored []

(6) CASING INSTALLED: Threaded [] Welded [X] 18" Diam. from 0 ft. to 1.05 ft. Gage .250

12" Diam. from 0 ft. to 1.58 ft. Gage .250 14" Diam. from 15.7 ft. to 15.8 ft. Gage .1375

(7) PERFORATIONS: Perforated? [X] Yes [] No

Type of perforator used: 1/2" X 8" Size of perforations in. by in. 240-trick perforations from 8.6 ft. to 10.6 ft. 240-trick perforations from 11.6 ft. to 13.6 ft. 216-trick perforations from 13.6 ft. to 15.4 ft.

(8) SCREENS: Well screen installed? [] Yes [X] No

Manufacturer's Name: Slot size: Set from: ft. to: ft. Diam. Slot size Set from ft. to ft.

(9) CONSTRUCTION:

Well seal—Material used in seal: Bentonite Depth of seal: 20 ft. Was a packer used? no Diameter of well bore to bottom of seal: 24 in. Were any loose strata cemented off? [] Yes [X] No Depth: Was a drive shoe used? [X] Yes [] No Was well gravel packed? [X] Yes [] No Size of gravel: 3/4-3/8 Gravel placed from: 0 ft. to 15.6 ft. Did any strata contain unusuable water? [] Yes [] No Type of water? depth of strata Method of sealing strata off

(10) WATER LEVELS:

Static level: 20' ft. below land surface Date Artesian pressure lbs. per square inch Date

(11) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? [X] Yes [] No If yes, by whom? Driller Yield: 2400 gal./min. with 80 ft. drawdown after 6 hrs. 1700 " 67 " 7 " 990 " 40 " 7 1/2 " Bailer test 480 gal./min. with 26 ft. drawdown after 8 hrs. Artesian flow g.p.m. Date Temperature of water Was a chemical analysis made? [] Yes [] No

(12) WELL LOG: Diameter of well below casing: 0

Depth drilled: 158 ft. Depth of completed well: 155 ft. Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

Table with columns: MATERIAL, FROM, TO. Entries include: Top, Brown Clay (0-2), Sandy Brown Clay with water (2-15), Brown Clay (15-24), Soft Blue Clay (24-38), Hard Brown Clay (38-55), Blue Clay (55-71), Blue Clay (71-73), Soft brown Clay with sand (73-94), Dark Brown Clay (94-98), Sandy Brown Clay (98-120), Sand & gravel (120-138), Blt Clay (138-158)

Work started: 12-3-64 Completed: 19 Date well drilling machine moved off of well: 4-27 1965

(13) PUMP:

Manufacturer's Name: Layne & Bowler Type: Lubline deep well H.P. 60

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: Mita Schneider-Cavillo (Person, firm or corporation) (Type or print)

Address: Box 97 St Paul Ore

Drilling Machine Operator's License No. 212

[Signed] Mita Schneider (Water Well Contractor)

Contractor's License No. 387 Date 4-27 1965

MAR. 1336

RECEIVED

JUL 20 1967 WATER WELL REPORT

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON within 30 days from the date of well completion.

STATE ENGINEER OF OREGON G-4171
SALEM, OREGON (Please type or print) GR-1377

State Well No. 4/2w-29 B
State Permit No.

(1) OWNER:

Name Edy Brentano
Address Star Rt. Box 28
St Paul Ore

(2) LOCATION OF WELL:

County Mason Driller's well number
1/4 Section 29 T. 45 R. 2W W.M.
Bearing and distance from section or subdivision corner
formerly Ted Van Duser well

(3) TYPE OF WORK (check):

New Well Deepening Reconditioning Abandonment
andonment, describe material and procedure in Item 12.

(4) PROPOSED USE (check):

Domestic Industrial Municipal Irrigation Test Well Other
Rotary Cable Dug Driven Jetted Bored

(5) TYPE OF WELL:

(6) CASING INSTALLED:

Threaded Welded
12" Diam. from 0 ft. to 158 1/2 ft. Gage 250
8" Diam. from 0 ft. to 91 ft. Gage 250

(7) PERFORATIONS:

Perforated? Yes No
Type of perforator used touch
Size of perforations 3/8 in. by 1/8 in.
480 perforations from 118 1/2 ft. to 158 1/2 ft.

(8) SCREENS:

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

(9) CONSTRUCTION:

Well seal—Material used in seal Bentonite
Depth of seal 20 ft. Was a packer used? yes
Diameter of well bore to bottom of seal 7.2 in.
Were any loose strata cemented off? Yes No Depth
Was a drive shoe used? Yes No
Was well gravel packed? Yes No Size of gravel: 38-34
Gravel placed from 0 ft. to 154 ft.
Did any strata contain unusable water? Yes No
Type of water? depth of strata
Method of sealing strata off

(10) WATER LEVELS:

Static level 34 ft. below land surface Date 6-10-67
Artesian pressure lb. per square inch Date

(11) WELL TESTS:

Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom?
Yield: 1500 gal./min. with 8 1/2 ft. drawdown after 8 hrs.
" 1220 " 73 " 8 1/2 "
" 800 " 54 " 9 "
Pump test 540 gal./min. with 4 1/2 ft. drawdown after 9 1/2 hrs.

(12) WELL LOG:

Diameter of well below casing
Depth drilled 158 1/2 ft. Depth of completed well 158 1/2 ft.
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Was 14" O.D. with 8" inside	152'	
we pulled the 8" out and set 12" inside the 14"		
we set an 8" 2' west of the 14"		
for gravel feed tube		
Dark Brown Clay	154-	158 1/2"
See attached copy of original well log		
Recover test 5 min	75 to 62	
	10'	62 to 60
	15'	60 - 58 - 3"
	20'	58 - 3 to 57' 4"

Work started #12-67 Completed 6-20-67
Date well drilling machine moved off of well 6-20-67

(13) PUMP:

Manufacturer's Name Layne & Bowler
Type: Submersible H.P. 30

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 Mike Schneider Equip Co.
(Person, firm or corporation) (Type or print)
Address Star Route Box 97 Pauline

Drilling Machine Operator's License No. 212
[Signed] Mike Schneider
(Water Well Contractor)
Contractor's License No. 387 Date 7-18-67

4/2w-29B

Marion

J. T. MILLER

Well Drilling Contractor

AURORA, OREGON

Ted Van Dyke,
ST. Paul Ore.

RECEIVED
JUL 20 1967

STATE ENGINEER
SALEM, OREGON

Log Of Well.

- 0-3 surface
- 3-7 clay
- 7-35 blue clay
- 35-68 hard grey clay
- 68-70 blue clay
- 70-80 broken clay with sand and water
- 80-87 grey clay
- 87-104 soft sandy clay
- 104-106 broken hard sand
- 106-111 blue clay
- 111-123 grey clay with small red sandy streaks
- 123-139 fine black sand
- 139-150 coarse black sand, small gravel
- 150-152 gravel.

Set 12 inch pipe 110 ft.
 set 152 ft 8 in. perforated 8 in. pipe
 at 140 to 150 and 95 to 99 ft., graveled between
 12 and 8 inch pipe, put 9 yards in.
 Static water level 21 ft.

Drawdown on test

280 gal. per. min.	30 ft.
400 " " "	42 "
600 " " "	57 "

Well Record

GR-1334

MARI. 1337

STATE ENGINEER
Salem, Oregon

STATE WELL NO. 4/2W-29B(1)
COUNTY Marion
APPLICATION NO. GR-1327

OWNER: Theodore M. Van Dyke
MAILING ADDRESS: ST Paul, Oregon

LOCATION OF WELL: Owner's No. #1
CITY AND STATE: ST Paul, Oregon

NW 1/4 NE 1/4 Sec. 29 T. 4 S. R. 2 W. W.M.
Bearing and distance from section or subdivision

corner 26201 S. 83° W. from NE cor. Sec. 29

Altitude at well 200 ft.

TYPE OF WELL: Drilled Date Constructed 1955

Depth drilled 152 ft. Depth cased 152 ft.

CASING RECORD:

12 in. steel casing from 42 to 110 ft.
8 in. steel casing from 0 to 152 ft.

FINISH:

8 in. casing perforated from 95 to 99 ft.
8 in. casing perforated from 140 to 150 ft.

AQUIFERS:

WATER LEVEL: 21 ft. (2-55)

PUMPING EQUIPMENT: Type Birmingham turbine
Capacity 220 G.P.M.
H.P. 15

WELL TESTS:

Drawdown 30 ft. after 30 hours 280 G.P.M.
Drawdown 57 ft. after 57 hours 600 G.P.M.

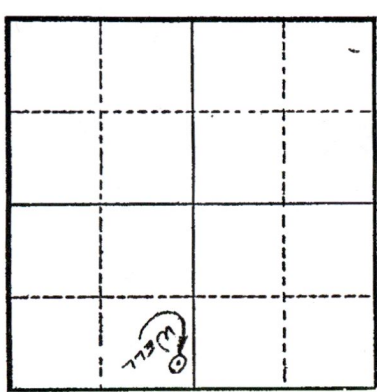
USE OF WATER Irrigation
SOURCE OF INFORMATION G. R. Record
DRILLER or DIGGER J. T. Miller

ADDITIONAL DATA:
Log X

Water Level Measurements
Chemical Analysis
Aquifer Test

REMARKS:

Irrigation of 29.7 acres.



Section 29

NOTICE TO WATER WELL CONTRACTOR

The original and first copy of this report are to be filed with the

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

STATE ENGINEER SALEM OREGON

WATER WELL REPORT

STATE OF OREGON

(Please type or print)

(Do not write above this line)

State Well No. 4/2w-19 dddc

State Permit No. _____

G-4729

(1) OWNER:

Name Ed Brentano
Address Starz Rd. Box 28
St. Paul Ore 97137

(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:

Threaded Welded
12" Diam. from 0 ft. to 174 ft. Gage 250
18" Diam. from 0 ft. to 100 ft. Gage 250

PERFORATIONS:

Perforated? Yes No.
Type of perforator used torch
Size of perforations 3/8 in. by 6 in.
7.20 perforations from 10.4 ft. to 16.4 ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.

(7) SCREENS:

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

(8) WATER LEVEL: Completed well.

Static level 64 ft. below land surface Date 7-11-68
Artesian pressure _____ lbs. per square inch Date _____

(9) WELL TESTS:

Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom?
1500 gal./min. with 62 ft. drawdown after 8 hrs.
1050 " " 46 " " 8 1/2 "
860 " " 41 " " 9 1/2 "
Bailer test 600 gal./min. with 51 ft. drawdown after _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes No

(10) CONSTRUCTION:

Well seal—Material used Cement and Bentonite
Depth of seal 83-98 cement, 0-20 Bentonite
Diameter of well bore to bottom of seal 32 in.
Were any loose strata cemented off? Yes No Depth _____
Was a drive shoe used? Yes No
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: 38-3/4
Gravel placed from 0 ft. to 174 ft.

(11) LOCATION OF WELL:

County Marion Driller's well number _____
1/4 1/4 Section 19 T. 4S R. 2W W.M.
Bearing and distance from section or subdivision corner _____

(12) WELL LOG:

Diameter of well below casing _____
Depth drilled 174 ft. Depth of completed well 172 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 as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
top soil	0	4	
brown clay	4	27	
blue clay	27	72	
sand	72	80	
blue clay	80	88	
coarse sand	88	98	
blue clay	98	100	
Cement gravel	100	102	
white s.s. (sandstone)	102	109	
large gravel	109	114	
gravel	114	147	
blue clay	147	158	
sand	158	161	
blue clay	161	174	

This well leaked around concrete so we had to gravel pack & develop upper portion after completion we dug out with back hoe to 12' and mixed bentonite to fill back then poured concrete slab over it as per phone conversation with Mr. Bartholomew

Work started 5-9 1968 Completed 7-13 1968
Date well drilling machine moved off of well 7-11 1968

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] Ridd Kalk Date 8-10, 1968
(Drilling Machine Operator)

Drilling Machine Operator's License No. 505

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 Milo Schneider Equipment Co
(Person, firm or corporation) (Type or print)

Address Starz Rd. Box 97, St. Paul Ore 97137

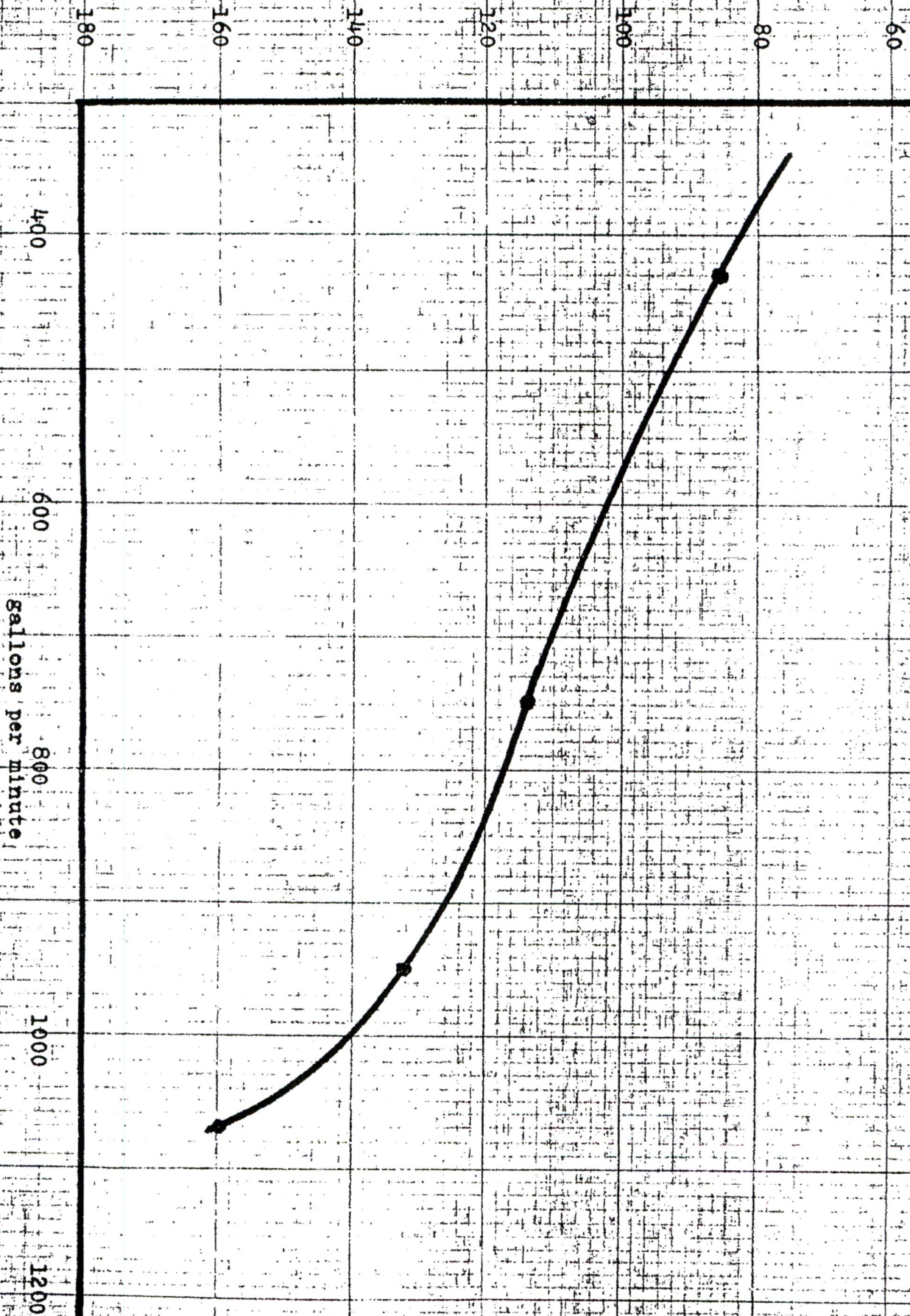
[Signed] Milo Schneider
(Water Well Contractor)

Contractor's License No. 387 Date 8-10-68

Harold Brentano

Material	From	To
Top soil	0	4
Brown clay	4	17
Light gray clay	17	20
Brown sandy clay	20	28
Fine brown sand	28	43
Coarse gravel (to 5")	43	46
Gray clay	46	48
Dark gray sandy clay	48	56
Brown sandy clay	56	63
Coarse black sand to $\frac{1}{4}$ "	63	66
Brown sandy clay	66	70
Gray sandy clay	70	71
Coarse black sand	71	72
Blue clay	72	81
Gray clay	81	85
Gray sandy clay w/ wood fibre & small amounts of medium sand	85	90
Gray clay	90	96
Sandy gray clay	96	107
Black sand (medium to coarse w/ some gray clay	107	115
Black sand w/ small pebbles .08 - .3	115	126
Gray clay	126	136
Dark gray sandy clay - large amounts medium sand	136	140
Black sand - coarse w/ wood fibre & small pebbles .08 - .3	140	156
Gravel fine to coarse .08 - 5"	156	183
Gray clay	183	203

Pumping Level - Depth in Feet



HAROLD BRENTZ
Well Test January 16, 1976

HAROLD BRENTANO
Well Recovery Test - January 16, 1976

