

WATER RESOURCES DEPARTMENT MEMO

May 27, 2015

TO: Application G- 17999
FROM: Phillip Marcy - Groundwater Section
SUBJECT: Scenic Waterway Interference Evaluation

YES
[X] NO
The source of appropriation is within or above a Scenic Waterway

YES
[X] NO
Use the Scenic Waterway condition (condition 7J)

Per ORS 390.835, the Groundwater Section is able to calculate groundwater interference with surface water that contributes to a Scenic Waterway. The calculated interference distribution is provided below.

Per ORS 390.835, the Groundwater Section is unable to calculate groundwater 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 flows necessary to maintain the free-flowing character of a scenic waterway.

DISTRIBUTION OF INTERFERENCE

Calculate interference as the monthly fraction of the annual consumptive use and fill in the table below. If interference cannot be calculated, per criteria in 390.839, do not fill in the table but check the "unable" option above, thus informing the Water Rights Section that the Department is unable to make a Preponderance of Evidence finding.

Exercise of this permit is calculated to reduce monthly flows in the Scenic Waterway by the following amounts, expressed as a proportion of the annual consumptive use pumped from the well.

Monthly Fraction of Annual Consumptive Use

Table with 12 columns: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 05/27/2015
 FROM: Groundwater Section Phillip I. Marcy / Ivan K. Gall
Reviewer's Name
 SUBJECT: Application G- 17999 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: Rudolf and Roberta Trenkel, Cathlene Winwood
 County: Malheur

A1. Applicant(s) seek(s) 0.56 cfs from 1 well(s) in the Malheur Basin,
 _____ subbasin

A2. Proposed use Irrigation (69.1 acres) Seasonality: March 1st to October 31st (245 days)

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	MALH 52491	1	Sand and Gravel	0.56	18S/46E-7 NW-SW	20'S, 717'E fr W ¼ cor S 7
2						
3						
4						
5						

* 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	2296	70	63	04/28/2003	95	0-18	+1-80	NA	71-80	295	84	Pump

Use data from application for proposed wells.

A4. **Comments:** The stated yield of the proposed POA (MALH 52491) appears to be sufficient to meet the applicant's desired rate.

A5. **Provisions of the** Malheur (690-510) 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: _____

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

Comments: _____

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

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

- a. is over appropriated, is not over appropriated, or cannot be determined to be over appropriated during any period of the proposed use. * This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;
- b. will not or will likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;
- c. will not or will likely to be available within the capacity of the groundwater resource; or
- d. will, if properly conditioned, avoid injury to existing groundwater rights or to the groundwater resource:
 - i. The permit should contain condition #(s) _____;
 - 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 _____ 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:** Based on the descriptions of lithology on the well log, the water –bearing zone in the applicant’s well (MALH 52491) occurs within sand and gravels overlying the Glenns Ferry Formation (Tig of Brooks and others, 1976). The production zone of sands and gravels is relatively thin (14 feet), but likely to be highly transmissive. Aquifer tests by Gannett (1990) estimate a range of hydraulic conductivities in the area between 400 ft/day and 670 ft/day. The resulting transmissivity for the sand and gravel aquifer at this location ranges from 5600 to 9380 ft²/day. Observation well data show groundwater levels in the area have been stable for decades (Figure 2) in the shallow alluvial aquifer system. Due to the thin nature of this aquifer, it is recommended that a modified measurement condition be emplaced to protect nearby senior groundwater right holders from possible interference (see below).

If a permit is issued, the following conditions should apply: 7T – measuring tube condition;
Modified Condition 7N (annual measurement condition) - The water user shall discontinue the use of, or reduce the rate or volume of withdrawal from, the well(s) if any of the following events occur:

- A. Annual water-level measurements reveal an average water-level decline of **two or more feet per year for three consecutive years;** or
- B. Annual water-level measurements reveal a water level decline of **6 or more feet** in fewer than five consecutive years; or
- C. Annual water-level measurements reveal a water-level decline of **10 or more feet;** or
- D. Hydraulic interference leads to a decline of **10 or more feet** in any neighboring well with senior priority.

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	Sand and gravel above Glenns Ferry Formation	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: The shallow sand and gravel aquifer is described as leaky confined by Gannett (1990) due to the permeability of the overlying silt layer. This principle is most easily displayed by lowering of head elevations within the overlying silt during pumping of wells constructed into the underlying sand and gravel aquifer.

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
1	1	Malheur River	2233	2204	5160	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: In the conceptual model of Gannett (1990), the Malheur River does not incise into the alluvial sand and gravel aquifer in the area of the proposed POA. As mentioned previously, however, the overlying silt has significant permeability, with a hydraulic conductivity likely one to two orders of magnitude smaller than that of the sands and gravels. This provides an inefficient connection to the Malheur River, likely made less efficient by additional deposits of fine fluvial material.

Water Availability Basin the well(s) are located within: Malheur River > Snake River – At Mouth (31011701)

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"/>	NA	NA	<input type="checkbox"/>	83.80	<input type="checkbox"/>	0.00	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<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.

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"/>
	<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: The Hunt (2003) model was used to calculate the expected impact of pumping at the proposed POA to the Malheur River over time, considering the lower permeability silt between the river and the producing aquifer. Model parameter values for hydraulic conductivity and storativity of the sand and gravel aquifer, and hydraulic conductivity of the confining silt fall within ranges determined by Gannett (1990). Results of the model predict that pumping at the proposed POA will intercept less than 0.18 cfs from the Malheur River after 245 days of pumping at the maximum requested rate, and the effects after 30 days will be negligible.

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													
(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: This table does not apply.

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:** The connection of the proposed POA to the Malheur River is inefficient, and given the distance and the rate proposed, does not have the potential to cause significant injury to surface waters. Leakage from local canals and ditch systems are major sources of recharge to the shallow sand and gravel aquifer system (Gannett, 1990), and the effects of reducing the flow through these systems on recharge is yet to be determined. For this reason, consistent annual measurements should be performed, according to the special condition described above (see B3).

References Used:

Gannett, M. W. 1990. Hydrogeology of the Ontario Area Malheur County, Oregon. Oregon Water Resources Dept. Ground Water Report No. 34. 39p.

Ferns, M.L., H.C. Brooks, J.G. Evans, M.L. Cummings. 1993. Geologic map of the Vale 30x60 minute quadrangle, Malheur County, Oregon and Owyhee County, Idaho. Oregon Dept. of Geology and Mineral Industries Geological Map Series 77.

Brooks, H.C., McIntyre, J.R., Walker, G.W., 1976. Geology of the Oregon Part of the Baker 1° by 2° Quadrangle. Oregon Dept. of Geology and Mineral Industries Geological Map Series 7.

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

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION						
Watershed ID #: 31011701 Time: 2:11 PM		MALHEUR R > SNAKE R - AT MOUTH Basin: MALHEUR			Exceedance Level: 80 Date: 05/21/2015	
Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net water Available
Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.						
JAN	154.00	427.00	-273.00	0.00	0.00	-273.00
FEB	267.00	626.00	-359.00	0.00	0.00	-359.00
MAR	467.00	911.00	-444.00	329.00	0.00	-773.00
APR	780.00	1,060.00	-278.00	470.00	0.00	-748.00
MAY	524.00	957.00	-433.00	0.00	0.00	-433.00
JUN	324.00	857.00	-533.00	0.00	0.00	-533.00
JUL	150.00	686.00	-536.00	0.00	0.00	-536.00
AUG	99.90	540.00	-440.00	0.00	0.00	-440.00
SEP	83.80	376.00	-292.00	0.00	0.00	-292.00
OCT	106.00	209.00	-103.00	0.00	0.00	-103.00
NOV	135.00	223.00	-87.90	0.00	0.00	-87.90
DEC	132.00	297.00	-165.00	0.00	0.00	-165.00
ANN	338,000	432,000	29,500	48,200	0	0

Well Location Map

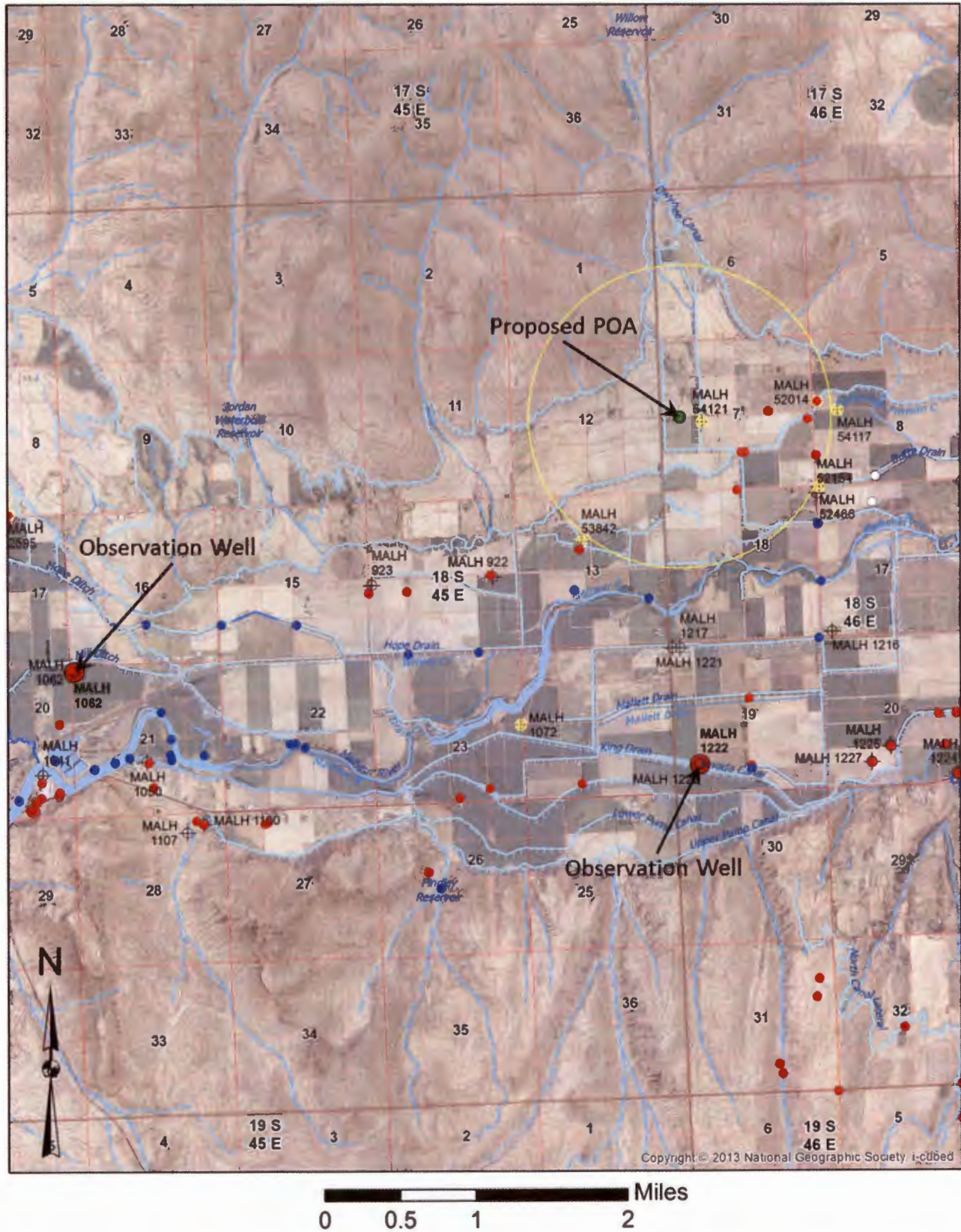


Figure 1: Map showing location of the proposed POA, in relation to the Malheur River and state observation wells MALH 1222 and MALH 1062.

Water-Level Trends in Nearby Wells

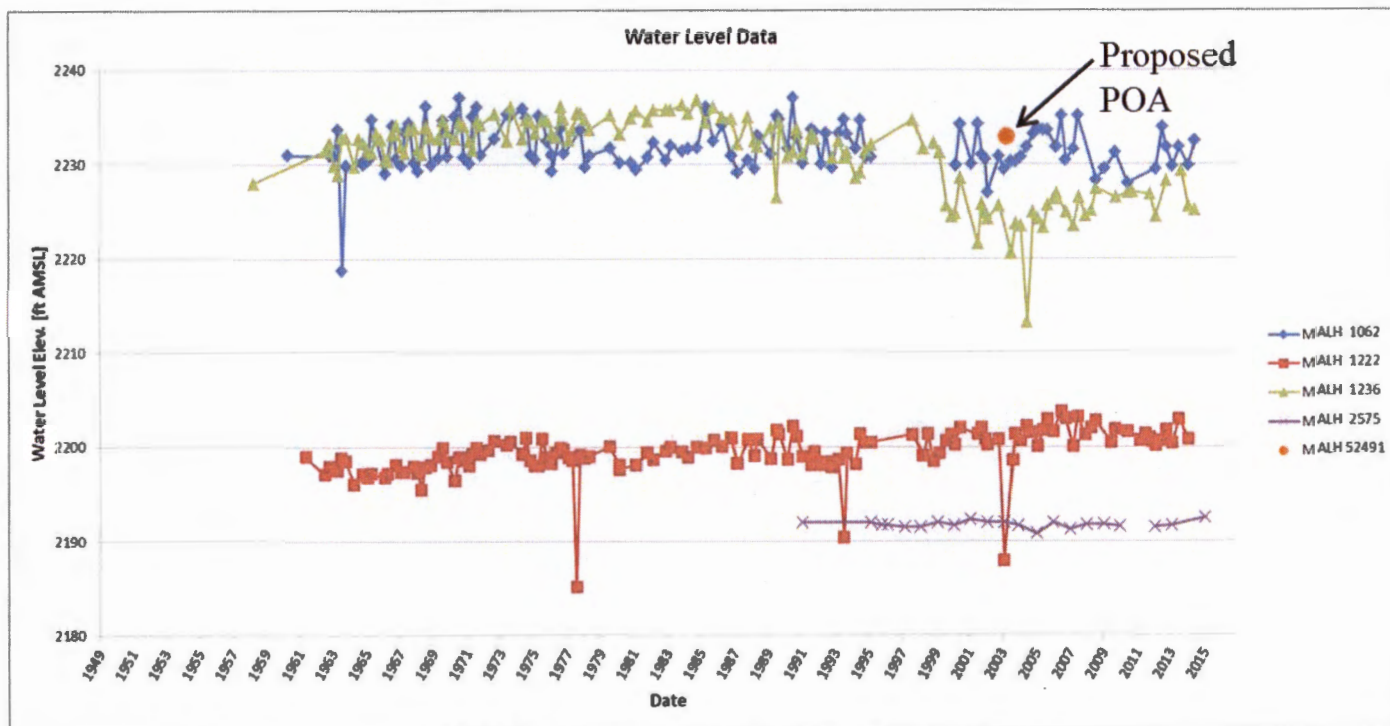
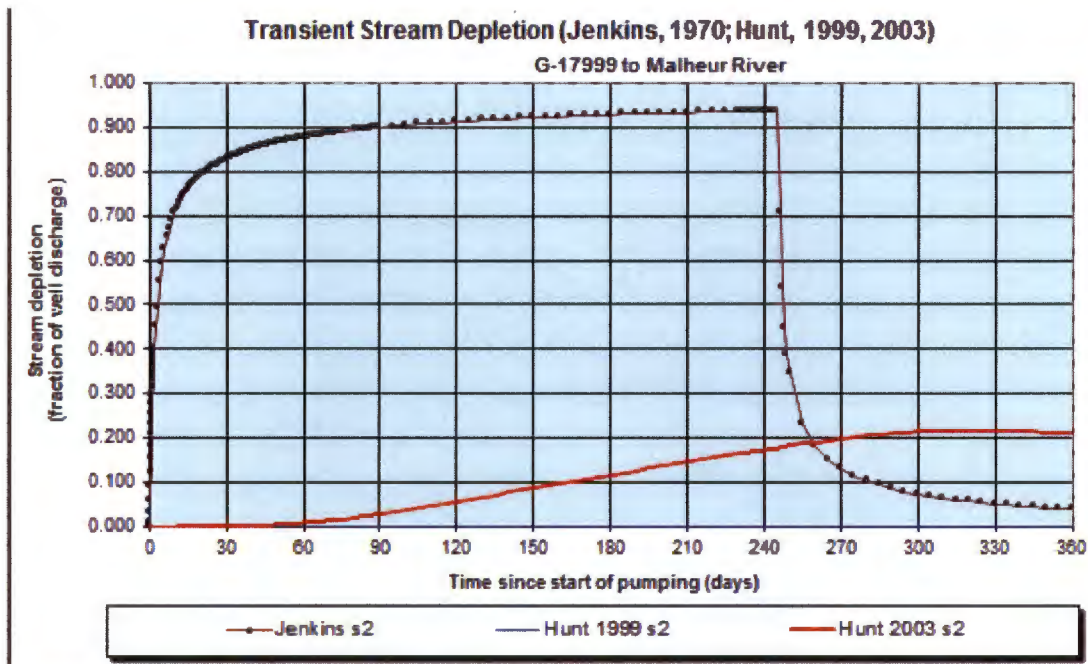


Figure 2: Water levels in nearby observation wells have remained stable for decades.



Output for Stream Depletion, Scenerio 2 (s2): Time pump on (pumping duration) = 245 days												
Days	30	60	90	120	150	180	210	240	270	300	330	360
JSD	82.8%	87.8%	90.0%	91.3%	92.3%	92.9%	93.4%	93.9%	13.1%	7.3%	5.1%	3.8%
HSD 1999	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
HSD 2003	-0.04%	0.80%	2.85%	5.64%	8.68%	11.69%	14.56%	17.24%	19.81%	21.47%	21.73%	21.00%
Qw, cfs	0.560	0.560	0.560	0.560	0.560	0.560	0.560	0.560	0.560	0.560	0.560	0.560
HSD 99, cfs	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
HSD 03, cfs	0.000	0.004	0.016	0.032	0.049	0.065	0.082	0.097	0.111	0.120	0.122	0.118

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	0.56	0.56	0.56	cfs
Time pump on (pumping duration)	tpon	245	245	245	days
Perpendicular from well to stream	a	5160	5160	5160	ft
Well depth	d	95	95	95	ft
Aquifer hydraulic conductivity	K	670	670	670	ft/day
Aquifer saturated thickness	b	14	14	14	ft
Aquifer transmissivity	T	9380	9380	9380	ft ² /day
Aquifer storativity or specific yield	S	0.001	0.001	0.001	
Aquitard vertical hydraulic conductivity	Kva	10	10	10	ft/day
Aquitard saturated thickness	ba	50	50	50	ft
Aquitard thickness below stream	babs	3	3	3	ft
Aquitard porosity	n	0.3	0.3	0.3	
Stream width	ws	70	70	70	ft
Streambed conductance (lambda)	sbc	233.333333	233.333333	233.333333	ft/day
Stream depletion factor	sdf	2.838550	2.838550	2.838550	days
Streambed factor	sbf	128.358209	128.358209	128.358209	
input #1 for Hunt's Q_4 function	t'	0.352293	0.352293	0.352293	
input #2 for Hunt's Q_4 function	K'	567.710021	567.710021	567.710021	
input #3 for Hunt's Q_4 function	epsilon'	0.003333	0.003333	0.003333	
input #4 for Hunt's Q_4 function	lamda'	128.358209	128.358209	128.358209	

Figure 3: Hunt (2003) model predicting no impact to the Malheur River from pumping at the proposed POA location for the first 30 days. At 240 days, nearly 20 percent of the volume pumped will be intercepted from the Malheur River, according to the model.

MALH 52491

**STATE OF OREGON
WATER SUPPLY WELL REPORT**
(as required by ORS 537.765)

WELL ID. # L U3446
START CARD # 52188

Instructions for completing this report are on the last page of this form.

(1) **LAND OWNER** Well Number _____
Name Trenkhal Bros Corp.
Address 1010 Railroad Ave
City Dufur State OR Zip 97914

(2) **TYPE OF WORK**
 New Well Deepening Alteration (repair/redo/condition) Abandonment

(3) **DRILL METHOD:**
 Rotary Air Rotary Mud Cable Auger
 Other _____

(4) **PROPOSED USE:**
 Domestic Community Industrial Irrigation
 Thermal Injection Livestock Other _____

(5) **BORE HOLE CONSTRUCTION**
Special Construction approved Yes No Depth of Completed Well 95'
Explosives used Yes No Type _____ Amount _____

HOLE		SEAL	
Diameter	From To	Material	From To
12"	0' to 75'	Bentonite	0' to 18'
B	75' to 95'	Gravel	

Seals in sacks 950
Gravel 7yds

How was seal placed Method A B C D E
 Other Bentonite
Backfill placed from _____ ft. to _____ ft. Material Reg Gravel
Gravel placed from 18' ft. to 75' ft. Size of gravel 3/8 minus

(6) **CASING/LINER:**

Casing	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
	8"	1'	75'		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Liner:					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Drive Shoe used Inside Outside None
Final location of shoe(s) 60'

(7) **PERFORATIONS/SCREENS:**

Perforations Method Torch
 Screens Type _____ Material _____

From	To	Slot size	Number	Diameter	Telephone size	Casing	Liner
71'	80'	7/16"	350	8"	pipe	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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

Yield gal/min	Drawdown	Drill stem at	Time
<u>250</u>		<u>95'</u>	<u>4 hr.</u>
<u>225</u>	<u>84'</u>		<u>4hr</u>

Temperature of water 60° Depth Artesian Flow Found _____
Was a water analysis done? Yes By whom _____
Did any strata contain water not suitable for intended use? Too little
 Salty Muddy Odor Colored Other _____
Depth of strata: _____

(9) **LOCATION OF WELL by legal description:**
County Malheur Latitude _____ Longitude _____
Township 18 N or S Range 46 E or W W.M.
Section 7 SE 1/4 SE 1/4
Tax Lot 4100 Lot _____ Block _____ Subdivision _____
Street Address of Well (or nearest address) Ray Rd

(10) **STATIC WATER LEVEL:**
63 ft. below land surface. Date 4-28-03
Artesian pressure _____ lb. per square inch Date _____

(11) **WATER BEARING ZONES:** 70

Depth at which water was first found _____

From	To	Estimated Flow Rate	SWL
70	79	250	63

(12) **WELL LOG:** Ground Elevation _____

Material	From	To	SWL
Brown Clay	0	58	
Sand	58	65	
Sand & Gravel	65	79	63
Brown Clay	79	81	
Blue Clay	81	95	

RECEIVED
OCT 29 2004
WATER RESOURCES DEPT
SALEM, OREGON

Date started 4-24-03 Completed 4-28-03

(unbonded) **Water Well Constructor Certification:**
I certify that the work I performed on the construction, 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.
WWC Number _____
Signed _____ Date _____

(bonded) **Water Well Constructor Certification:**
I accept responsibility for the construction, 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.
WWC Number 488
Signed July 2 2004 Date 5-15-03

ORIGINAL - WATER RESOURCES DEPARTMENT FIRST COPY - CONSTRUCTOR SECOND COPY - CUSTOMER

ORIGINAL
File Original and
Duplicate with the
STATE ENGINEER,
SALEM, OREGON

MAY 1 1959

OBSERVATION WELL
WATER WELL REPORT

State Well No. 18/46-230 (1)

STATE ENGINEER STATE OF OREGON

State Permit No. H-789

(1) OWNER:

Name Paul Teramura
Address ONTARIO ORE

(11) WELL TESTS:

Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? HOLLOWAY DRILLING CO.
Yield: 580 gal./min. with 41 ft. drawdown after 4 hrs.

(2) LOCATION OF WELL:

County MALHEUR Owner's number, if any _____
Section _____
Bearing and distance from section or subdivision corner _____

Ballor test gal./min. with _____ ft. drawdown after _____ hrs.

Artesian flow g.p.m. Date _____

Temperature of water _____ Was a chemical analysis made? Yes No

(12) WELL LOG:

Diameter of well 14 inches
Depth drilled 240 ft. Depth of completed well 240 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
TOP SOIL	0	2'
HARD PAN CLAY	2'	10'
SANDY CLAY	20	28
SAND WITH WATER	28	32
SAND & GRAVEL " "	32	50
SAND ROCK " "	50	70
BLACK SAND " "	70	71
SANDY SHALE	71	100
BLUE SHALE	100	160
SAND STRIP	160	161
HARD BLUE SHALE	161	220
SANDY SHALE	220	225
HARD BLUE SHALE	225	240

(3) TYPE OF WORK (check):

New Well Deepening Reconditioning Abandon
If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic Industrial Municipal
Irrigation Test Well Other

(5) TYPE OF WELL:

Rotary Driven
Cable Jetted
Dug Bored

(6) CASING INSTALLED:

Threaded Welded
14" Diam. from -2 ft. to 54 ft. Gage 280
" Diam. from _____ ft. to _____ ft. Gage _____
" Diam. from _____ ft. to _____ ft. Gage _____

(7) PERFORATIONS:

Perforated? Yes No
Type of perforator used _____
SIZE of perforations 3/8" in by 4" in
248 perforations from _____ ft. to _____ ft.
21 perforations from 21 ft. to 52' ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.

(8) 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.

(9) CONSTRUCTION:

Was well gravel packed? Yes No Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.
Was a surface seal provided? Yes No To what depth? _____ ft.
Material used in seal _____
Did any strata contain unusable water? Yes No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(10) WATER LEVELS:

Static level 21 ft. below land surface Date 5-1-58
Artesian pressure _____ lbs. per square inch Date _____

Log Accepted by:

(Signed) Paul Teramura Date May 12 1958
(Owner)

Work started 4-23 1958 Completed 5-1 1958

(13) PUMP:

Manufacturer's Name Jaquzzi
Type Deep Well Turbine

Well Driller's Statement:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME HOLLOWAY DRILLING CO.
(Person, firm, or corporation) (Type or print)

Address 80 HILLcrest DR.
ONTARIO ORE

Driller's well number _____
(Signed) May Holloway
(Well Driller)

License No. 16 Date 5-12 1958

(USE ADDITIONAL SHEETS IF NECESSARY)

RECEIVED MAIL 1222 JUL 17 1961 OBSERVATION WELL

(mail) 1222 State Well No. 19/46-19A State Permit No.

File Original and First Copy with the STATE ENGINEER, SALEM, OREGON

STATE ENGINEER WATER WELL REPORT STATE OF OREGON

(1) OWNER: Name Glen Hutchinson Address ONTARIO ORE.

(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: 500 gal./min. with 85 ft. drawdown after 4 hrs.

(2) LOCATION OF WELL: County Owner's number, if any -- 5.W. Section 19 T. 18 R. 46 W.M. Bearing and distance from section or subdivision corner

(12) WELL LOG: Diameter of well 16 inches. Depth drilled 435 ft. Depth of completed well 435 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.

(3) TYPE OF WORK (check): New Well Despensing Reconditioning Abandonment

(4) PROPOSED USE (check): Domestic Industrial Municipal Irrigation Test Well Other (5) TYPE OF WELL: Rotary Cable Dug Driven Jetted Bored

(6) CASING INSTALLED: Threaded Welded 16" diam. from 2 ft. to 28" ft. Gage

(7) PERFORATIONS: Perforated? Yes No Type of perforator used Size of perforations 132 perforations from 18 3/8 in. to 28 in.

(8) SCREENS: Well screen installed? Yes No Manufacturer's Name Type Slot size Set from ft. to ft.

(9) CONSTRUCTION: Was well gravel packed? Yes No Size of gravel: Gravel placed from ft. to ft. Was a surface seal provided? Yes No To what depth? 17 ft. Material used in seal puddled clay

(10) WATER LEVELS: Static level 11 ft. below land surface Date 6-25-61 Artesian pressure lbs. per square inch Date Log Accepted by: (Signed) (Owner) Date 19__

Table with 3 columns: MATERIAL, FROM, TO. Contains handwritten entries for well log materials like TOP SOIL, SAND, GRAVEL, BLUE CLAY, SAND STRIP, BLUE HARD CLAY, SAND STRIP, BLUE CLAY, SAND + CLAY MIXED, HARD CLAY, SAND STRIP, SAND ROCK, PEAGRAVEL, SAND ROCK, BLUE CLAY.

Work started 6-14 1961 Completed 6-24 1961

(13) PUMP: Manufacturer's Name Peerless Type Turbine H.P. 20HP.

Well Driller's Statement: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. NAME Max Holloway Address Ontario Ore. Driller's well number (Signed) Max Holloway License No. 16 Date 7-8 1961

(USE ADDITIONAL SHEETS IF NECESSARY)