

March 23, 2015

[illegible]

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 03/23/2015

FROM: Groundwater Section Phil Marcy/Karl Wozniak
Reviewer's Name

SUBJECT: Application G- 17948 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: Michael and Susan Frank County: Yamhill

A1. Applicant(s) seek(s) 0.11 cfs from 1 well(s) in the Willamette Basin,
Chehalem Creek subbasin Quad Map: Newberg

A2. Proposed use Irrigation Seasonality: March 1st – October 31st

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	YAMH 56904	1	CRB	0.11	3S/2W-10 NW-NW	360' S, 1310' E fr NW cor S 10
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	812	421	330	05/15/2014	522	0-277	+2-277	142-522	483-521	50	?	Air

Use data from application for proposed wells.

A4. Comments:

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 applicant's well produces from a confined aquifer, so the pertinent basin rules (OAR 690-502-0240) do not apply.

A6. ☒ Well(s) # 1, tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: Chehalem Mountain Groundwater Limited Area
Comments: According to OAR 690-502-0200, groundwater in the basalt aquifers of the Chehalem Mountain Groundwater Limited Area is classified for exempt uses, irrigation, and rural residential fire protection systems only. Permits may be issued, for a period not to exceed five years, for fire protection and for drip or equally efficient irrigation. The amount of water used for irrigation shall further be limited to one acre-foot per acre per year. Permits may be extended for additional five year periods if the Director of the Oregon Water Resources Department finds that the groundwater resource can probably support that extended use.

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, 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 _____ 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:

SPECIAL CONDITION: The source of water for this permit shall be the water-bearing zones in the Columbia River Basalt Group that occur in well YAMH 56904 between depths of 421 and 509 feet. The well shall not be deepened or altered such that water is produced from other aquifers in the Columbia River Basalt Group.

Although unconfined groundwater occurs near the surface of the basalts, most water occurs at thin rubble zones (interflow zones) at the contacts between lava flows. The interiors of the basalt flows generally have low porosity and permeability and act as confining beds. This geometry results in a stack of thin aquifers (interflow zones), divided by thick confining beds (flow interiors). The low permeability of the basalt flow interiors results in very little connection between stacked aquifers, which generally leads to significantly different heads in the water-bearing zones. In the area of the proposed permit, the basalt aquifers have been truncated by local drainages, which have incised to various levels into the basalt column. The applicant's well (YAMH 56904) produces from several water-bearing zones in the Columbia River Basalt Group (CRBG), a series of lava flows with a composite thickness that ranges up to 700-800 feet in the area. An analysis of ground water elevations in the area suggests the water-bearing zone in the applicant's well may be shared by other groundwater users (Figure 3). Long term trends indicate relatively stable water levels in this area, with no significant losses in head within the CRB aquifers to this point in time.

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	CRB	☒	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The static water level provided by the driller is higher than the depth at which water was first found, according to the well log, indicating confined conditions.

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	Chicken Creek	482	520-800	2575	☐	☒	☐	☐	☒
1	2	Baker Creek	482	760-990	3530	☐	☒	☐	☐	☒
1	3	Spring Brook	482	450	3900	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: Locally CRB lava flows and associated interflow zones are dipping at an angle of approximately 2 to 3 degrees toward the NNE, based on limited geologic map data and cuttings analyses. On this basis, streams to the northeast of the proposed POA do not incise deeply enough to intersect the water-bearing zones open to this well within at least two miles, and are likely separated by a number of confining beds (basalt flow interiors). Therefore, there is likely no effective hydraulic connection between the production zones in the well and streams NNE of the well.

The water-bearing zone in the applicant's well (YAMH 56904) is found at elevations of 303-391 feet above mean sea level. The perennial reach of Chicken Creek within 1 mile of the proposed POA ranges from 800 feet down to 520 feet above sea level. At a distance of 2600 to 5280 feet, the local dip puts the top of the water-bearing zone in this area at 303 to 210 feet above sea level, much below the level of surface water in the stream. Baker Creek is nearest the proposed POA toward the NNW, meaning that this reach is roughly on strike with the well. The lowest elevation in this reach of the Baker Creek, however, is several hundred feet above the water-bearing zone in the well.

Of some concern are springs located up dip from the well to the SSW, with calculations based on a horizontal distance of 3900 feet from the well showing that the water-bearing zone at this location should be exposed between 435 and 523 feet elevation. Given the coincident elevations and proximity of these ground and surface water zones, they are likely hydraulically connected. These springs emerge from the steep erosional surface on the southwestern side of Chehalem Mountain, feeding small tributaries to Spring Brook, in addition to being utilized by surface water rights. The City of Newberg holds a surface water right on two of these springs that emerge within about a mile of the applicant's well (cert: 2389), and are permitted to use up to 4 cfs. The potential for interference to these springs by pumping groundwater from the proposed POA is significant, given the speed at which the effects of pumping propagate in CRB systems.

Water Availability Basin the well(s) are located within: WILLAMETTE R > COLUMBIA R - AB MOLALLA R

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	3	☐	☐	NA	NA	☐	3830	☐	NA	☐
		☐	☐			☐		☐		☐

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: Interference at 30 days was not calculated because we do not have an appropriate analytical model for aquifer/stream interaction in stratiform basalt aquifers.

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) = (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: There is no readily available model to estimate stream depletion impacts for wells that produce from stratiform basalt aquifers.

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** As stated in section A6, permits in the Chehalem Mountain Groundwater Limited Area are only valid for five years, and need approval from the Director of Oregon Water Resources Department to gain an extension. If at that time it is determined that this aquifer is showing substantial declines, and/or other water right holders determined to produce from the same system are showing injury, this extension should not go forward.

References Used:

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: U.S. Geological Survey Scientific Investigations Report 2005-5168.

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, 32p.

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, 82p.

OWRD water level database, includes reported water levels, accessed 3/15/2015.

US Geological Survey Topographic Quadrangle Maps.

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 #: 182		WILLAMETTE R > COLUMBIA R - AB MOLALLA R			Exceedance Level: 80	
Time: 4:53 PM		Basin: WILLAMETTE			Date: 03/12/2015	
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	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	15,100.00	0.00	1,500.00	13,600.00
APR	19,900.00	6,910.00	13,000.00	0.00	1,500.00	11,500.00
MAY	16,600.00	4,230.00	12,400.00	0.00	1,500.00	10,900.00
JUN	8,740.00	1,980.00	6,760.00	0.00	1,500.00	5,260.00
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	683.00
SEP	3,890.00	1,400.00	2,490.00	0.00	1,500.00	993.00
OCT	4,850.00	750.00	4,100.00	0.00	1,500.00	2,600.00
NOV	10,200.00	880.00	9,320.00	0.00	1,500.00	7,820.00
DEC	19,300.00	961.00	18,300.00	0.00	1,500.00	16,800.00
ANN	15,200,000	2,250,000	13,000,000	0	1,090,000	11,900,000

Attached Well Logs:

YAMH 56904 (applicant's well)

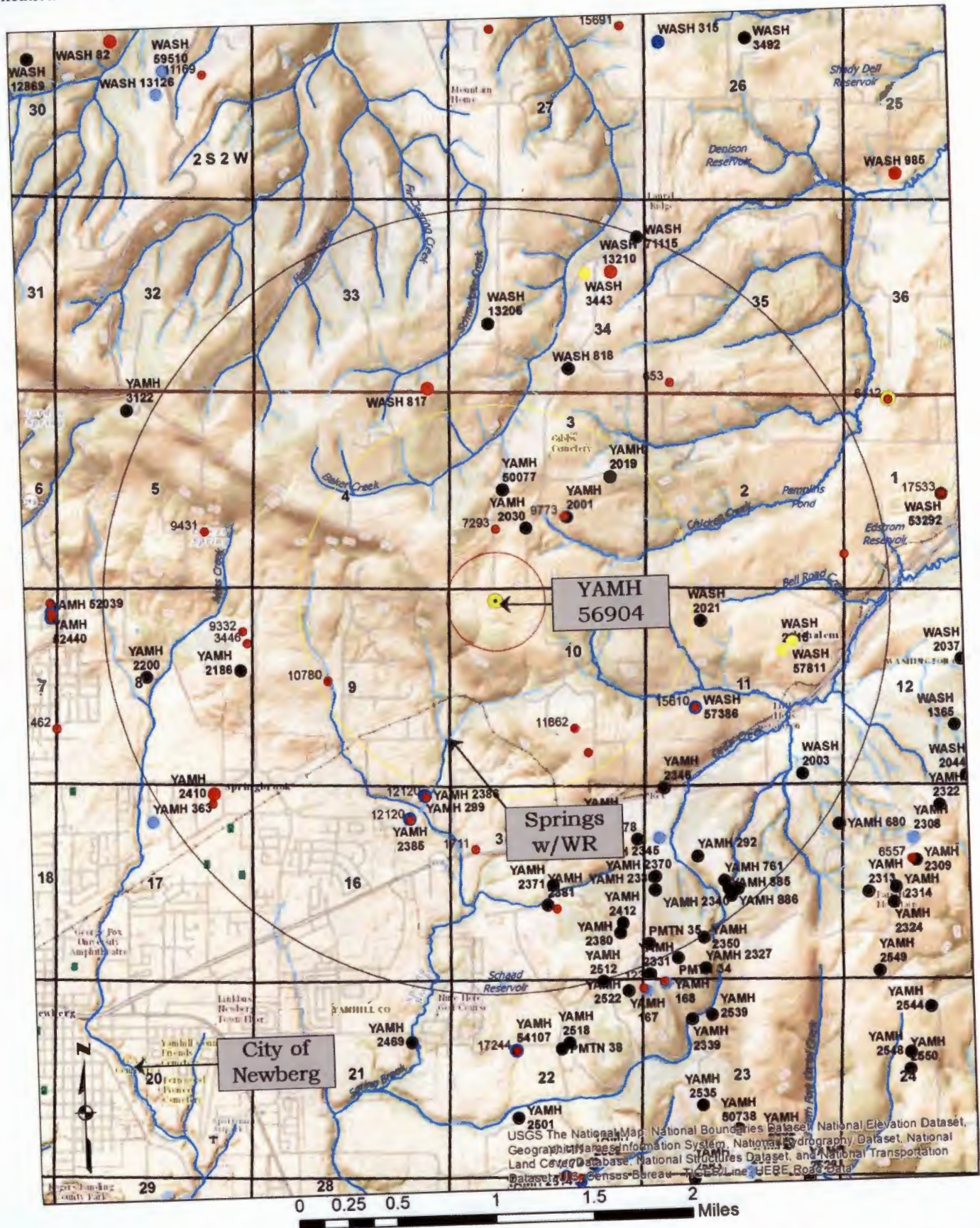


Figure 1: Map showing location of G-17948 (YAMH 56904) and groundwater rights. Observation wells determined to share an aquifer with the applicant's well are highlighted in yellow. Well logs for these wells are included below.

RECEIVED BY OWRD YAMH 56904

OCT 06 2014

State of Oregon
WATER WELL REPORT (as required by ORS 517.765)

Page 1 of 1

State Well ID: 114416
Start Card #: 1071231

SALEM, OR

(1) OWNER: Well No. 2867
Name: MIKE FRANK
Address: 12469 KANE TERRACE CT
City: SHERWOOD St OR Zip 97140

(2) TYPE OF WORK: NEW WELL

(3) DRILL METHOD: ROTARY AIR

(4) PROPOSED USE: DOMESTIC

(5) BORE HOLE CONSTRUCTION:
Special Construction Approval NO Depth of Compl. Well 522 ft
Explosives used NO Type Amount
HOLE SEAL
Diam. From To Material From To Amount
10 0 277 BENTONITE CHIP 0 50 25 SAK
4 277 522 ANNULAR BACFIL
W/BENTONITE CHI 50 70 10 SAK
CEMENT 70 277 67 SAK
Seal placement method C AND POURED
Backfill: from ft to ft Material
Gravel: from ft to ft Size

(6) CASING/LINER:
Diam. From To Gauge Material Connection
Casing 6 +2 277 .25 STEEL WELDED
Liner 4 142 522 SCH40 PLASTIC THREADED
Final Location of shoe(s) 277 // SPLINE-LOC LINER

(7) PERFORATIONS/SCREENS:
(X) Perf. Method CIRCULAR SAW
() Screens Type Material
Slot
From To Size Number Diam. Size Casing/liner
483 501 .136" 36 LINER
511 521 .136" 20 LINER

(8) WELL TESTS: Minimum testing time is 1 hour
Test type AIR
Yield GPM Draw-down Drill stem at Time
50 522 1 hr
50 505 1
Temperature of water SIF Depth Artesian Flow Found
Was water analysis done? NO By whom
Reason for water not suitable for use
Depth of strata

(9) LOCATION OF WELL by legal description:
County YAMHILL Lat. Long.
Township 3 S Range 2 W Sec 10
Section 10 NE 1/4 SW 1/4
Tax Lot 1003 Lot Block Subdivision
Street Address of Well (or nearest Address):
30520 NE BELL RD HENDERSON, OR

(10) STATIC WATER LEVEL:
330 ft below land surface. Date 05/15/14
Artesian pressure lb per square in. Date

(11) WATER BEARING ZONES:
Depth at which water was first found 421
From To Est Flow Rate SWL
421 505 50 330

(12) WELL LOG:
Ground elevation
Material From To SWL
TOP SOIL 0 5
CLAY, LIGHT BROWN 5 16
BASALT, DECAYED BROWN 16 114
BASALT, GRAY W/SOME DECAY 114 179
BASALT, SOFT DECAY BROWN 179 219
BASALT, HARDER W/SOME GRAY 219 270
BASALT, GRAY HARD 270 317
BASALT, GRAY W/SOME BROWN/OCC DECAY 317 355
BASALT, HARD GRAY W/OCC BROWN 355 421
BASALT, BROWN DECAY W/SOME GRAY 421 433
BASALT, BRIGHT RED W/SOME GRAY VEIN 433 471
BASALT, GRAY AND BROWN SOME VEIN 471 482
BASALT, GRAY W/SOME BROWN 482 509
BASALT, HARD GRAY 509 522

DAVE FAYSLINGER, hlnwaterdrilling.com
(503) 845 7878
Date started 09/05/14 Completed 09/19/14

(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 my best knowledge and belief.
Signed _____ Date _____
WMC Number _____

(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.
Signed *David H. Fayslinger* WMC Number 1438
Date 7/15/14

ORIGINAL & FIRST COPY WATER RESOURCES DEPARTMENT

SECOND COPY - CONSTRUCTOR

THIRD COPY - CUSTOMER

DATE 10/91

Figure 2: Well log for the proposed groundwater POA, YAMH 56904.

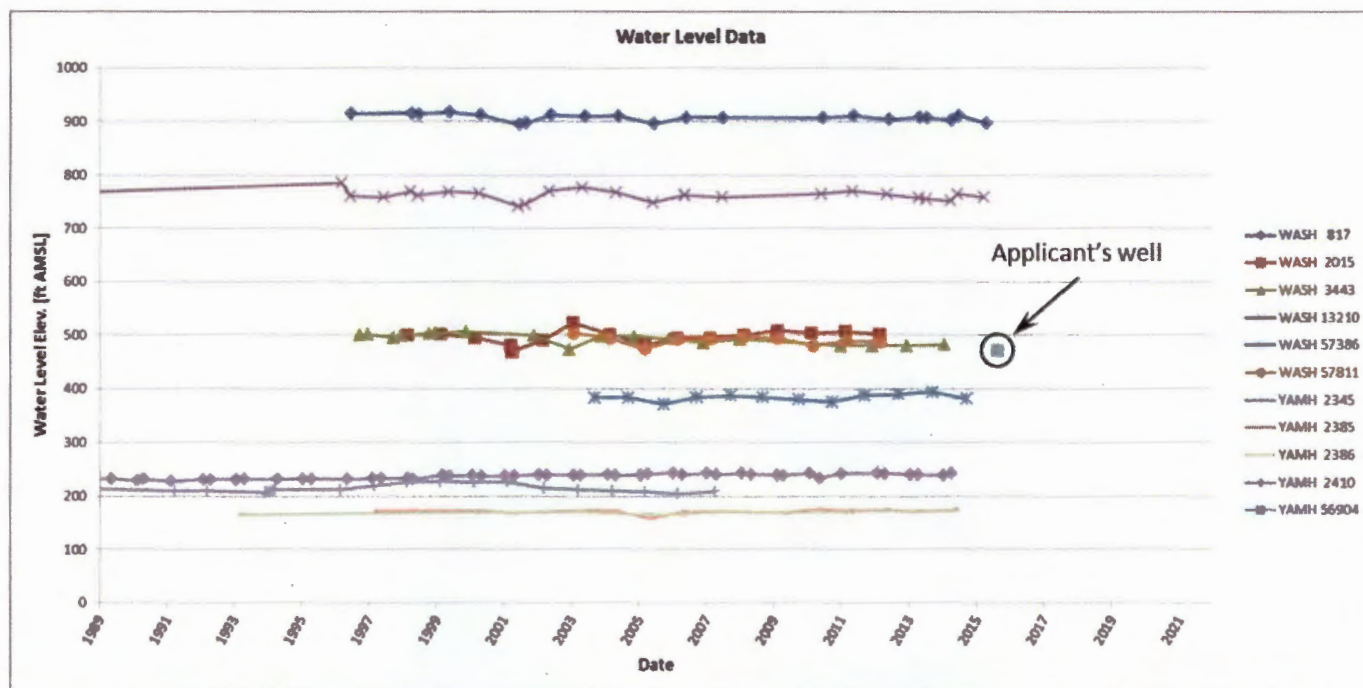


Figure 3: Water elevations in nearby basalt wells show correspondence between the applicant's well (YAMH 56904) and three other observation wells. Water levels in these wells appear relatively stable over the period of record.