

Groundwater Application Review Summary Form

Application # G- 18750

GW Reviewer M. Thoma Date Review Completed: 08-19-19

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).

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 08/19/2019
 FROM: Groundwater Section M Thoma
 Reviewer's Name
 SUBJECT: Application G- 18750 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: Housing Authority of Lane Co. County: Lane

A1. Applicant(s) seek(s) 0.56 cfs from 2 well(s) in the Willamette Basin,
Willamette-McKenzie subbasin

A2. Proposed use Irrigation (17.2 ac) Seasonality: Mar. 1 – Oct. 31 (244 d)

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	PROPOSED	North Well	Alluvium	0.17	17S/03W-27 NESE	2122'N, 403'W of SE cor S27
2	PROPOSED	South Well	Alluvium	0.38	17S/03W-27 NESE	1860'N, 138'W of SE cor S27
3						

* 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	445	*	15*	*	85	0-18	0-20	-	-	-	-	-
2	445	*	15*	*	85	0-18	0-20	-	-	-	-	-

Use data from application for proposed wells.

A4. **Comments:** *both wells are proposed, SWL estimated from well logs in the area

A5. **Provisions of the** Willamette (OAR 690-502) 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) 7N (SWL Reporting); Medium 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:** There are limited water level data in the aquifer and vicinity of the applicant’s proposed POAs so Capacity of the Resource cannot be determined and water-level reporting conditions in B1(d) are recommended. There is one permitted groundwater right within 1 mile of the applicant’s proposed POA but it is unlikely that the applicant’s use would result in injury to this permitted water right given the generally high transmissivity and storativity of the alluvial aquifer system in the area. However, standard interference conditions should be applied

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	Alluvium	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Alluvium	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: "SWL" reported on wells logs are generally near reported "First Water" for shallower wells, implying the proposed wells will encounter unconfined aquifer 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	Willamette River	430	415-435	4180	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Willamette River	430	415-435	3980	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	McKenzie River	430	415-435	5290	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	2	McKenzie River	430	415-435	5440	<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"/>

Basis for aquifer hydraulic connection evaluation: GW elevations are near SW elevations implying that water is flowing between the aquifer and surface water.

Water Availability Basin the well(s) are located within: Willamette R > Columbia R – AB McKenzie R (ID# 185) **and hydraulically connected with** McKenzie R > Willamette R – AB Mouth (ID# 528)

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"/>	MF185	2000	<input type="checkbox"/>	788	<input type="checkbox"/>	~10 %	<input type="checkbox"/>
2	1	<input type="checkbox"/>	<input type="checkbox"/>	MF185	2000	<input type="checkbox"/>	788	<input type="checkbox"/>	~10 %	<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?
1	<input type="checkbox"/>	MF185	2000	<input type="checkbox"/>	788	<input type="checkbox"/>	~10 %	<input type="checkbox"/>
	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

Comments: Interference at 30 d was estimated using the Hunt-1999 stream-depletion model with parameter values taken from pump tests in the area, extracted from Herrera et al. (2014), or representative of alluvial aquifer material.

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
1	2	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS		Stream-depletion was not modeled because the maximum rate of appropriation for the application is less than 1% of the 80% exceedance flow for each month											
Interference CFS													
2	2	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.													
(B) = 80 % Nat. Q		5040	5850	5630	5020	4000	2990	2160	1790	1730	1830	2850	4450
(C) = 1 % Nat. Q		50.4	58.5	56.3	50.2	40.0	29.9	21.6	17.9	17.3	18.3	28.5	44.5
(D) = (A) > (C)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100		< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %

(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:** The applicant's proposed POAs would be producing from an aquifer that has been found to be hydraulically connected to surface water – specifically the Willamette and McKenzie Rivers at a distance of less than 1 mile for the Willamette and slightly over one mile for the McKenzie. The proposed maximum rate of appropriation is less than 1% of the pertinent adopted perennial streamflow and also less than 1% of the adopted instream water rights for either surface water source and estimated stream-depletion is less than 25 % after 30 days. Per OAR 690-009-0040(4) the POAs are assumed to **not** have the Potential for Substantial Interference

References Used:

Gannett, M. W. and R. R. Caldwell. 1998. *Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington*. USGS Professional Paper 1424-A.

Herrera, N. B., Burns, E. R., and T. D. Conlon. 2014. *Simulation of Groundwater Flow and the Interaction of Groundwater and Surface Water in the Willamette Basin and Central Willamette Subbasin, Oregon*. USGS Scientific Investigations Report 2014-5136.

Hunt, B. 1999. *Unsteady Stream Depletion from Ground Water Pumping*. Journal of Hydrologic Engineering, Vol 8(1), pp 12-19

McClaghry, J. D., T. J. Wiley, M. L. Ferns, and I. P. Madin. 2010. *Digital Geologic Map of the Southern Willamette Valley, Benton, Lane, Linn, Marion, and Polk Counties, Oregon*. Oregon Dept. of Geology and Mineral Industries. Open File Report O-10-13.

O’Conner, J. E., A. Sarna-Wojcicki, K. C. Wozniak, D. J. Polette, and R. J. Fleck. *Origin, Extent, and Thickness of Quaternary Geologic Units in the Willamette Valley, Oregon*. USGS Professional Paper 1620

OWRD Well Log Database – Accessed 08/19/2019

Woodward, D. G., M. W. Gannett, and J. J. Vaccaro. 1998. *Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington*. USGS Professional Paper 1424-B.

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

Water Availability Analysis Detailed Reports

WILLAMETTE R > COLUMBIA R - AB MCKENZIE R
WILLAMETTE BASIN

Water Availability as of 8/19/2019

Watershed ID # 185 (Map) Exceedance Level 80% ▾
Date 8/19/2019 Time 2:34 PM

Water Availability Calculation
Consumptive Uses and Storages
Instream Flow Requirements
Reservations

Water Rights
Watershed Characteristics

Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	3,490.00	784.00	2,710.00	0.00	2,500.00	206.00
FEB	4,210.00	2,760.00	1,450.00	0.00	2,500.00	-1,050.00
MAR	4,360.00	2,880.00	1,480.00	0.00	2,500.00	-1,020.00
APR	4,340.00	2,820.00	1,520.00	0.00	2,500.00	-983.00
MAY	3,720.00	1,750.00	1,970.00	0.00	2,500.00	-532.00
JUN	1,910.00	336.00	1,570.00	0.00	2,000.00	-426.00
JUL	1,040.00	109.00	931.00	0.00	2,000.00	-1,070.00
AUG	788.00	102.00	686.00	0.00	2,000.00	-1,310.00
SEP	789.00	88.00	701.00	0.00	2,000.00	-1,300.00
OCT	938.00	57.10	881.00	0.00	2,000.00	-1,120.00
NOV	1,510.00	143.00	1,370.00	0.00	2,500.00	-1,130.00
DEC	3,310.00	58.90	3,250.00	0.00	2,500.00	751.00
ANN	3,000,000.00	710,000.00	2,290,000.00	0.00	1,660,000.00	861,000.00

Water Availability Analysis Detailed Reports

MCKENZIE R > WILLAMETTE R - AB MOUTH
WILLAMETTE BASIN

Water Availability as of 8/19/2019

Watershed ID # 528 (Map) Exceedance Level 80% ▾
Date 8/19/2019 Time 2:26 PM

Water Availability Calculation
Consumptive Uses and Storages
Instream Flow Requirements
Reservations

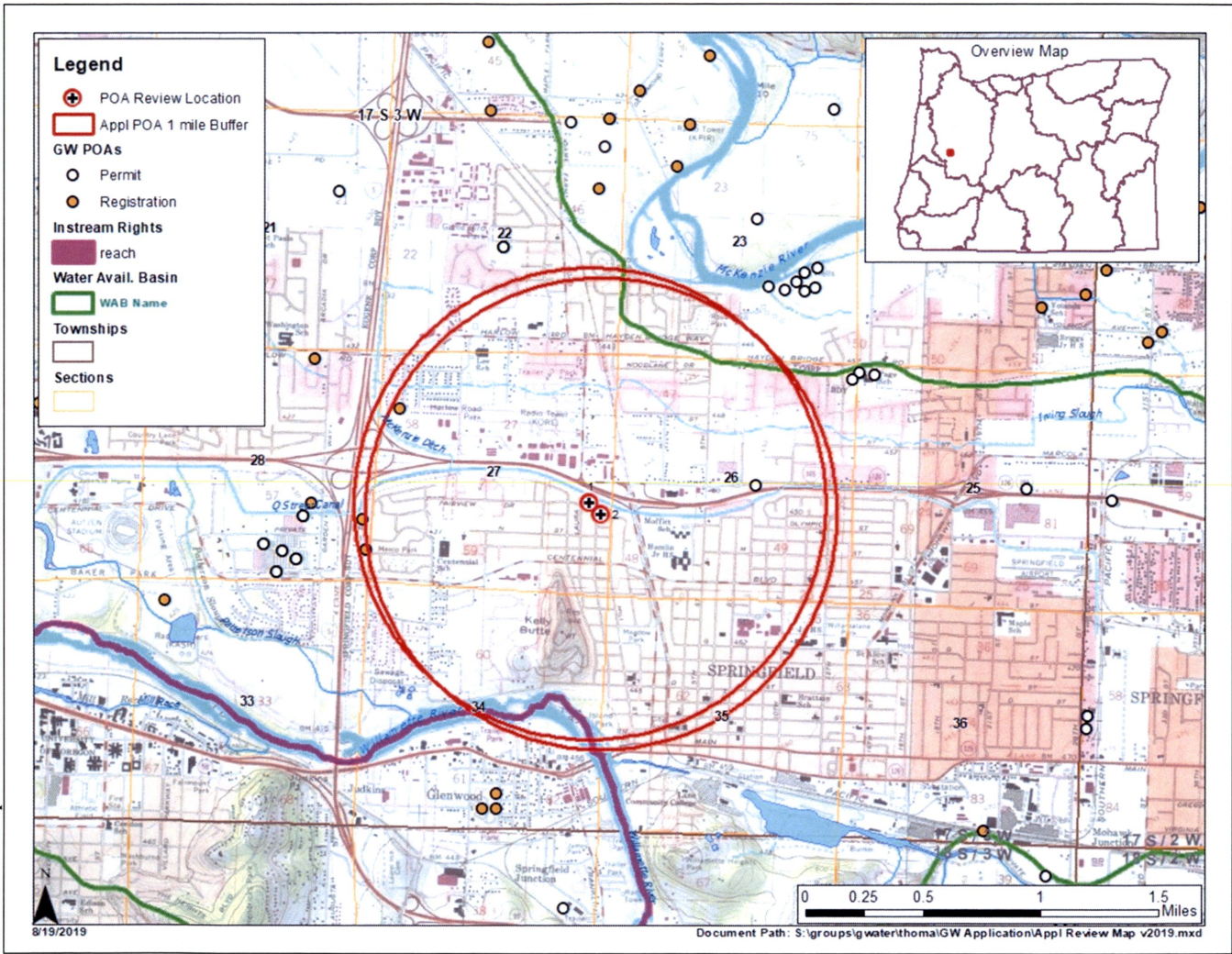
Water Rights
Watershed Characteristics

Water Availability Calculation

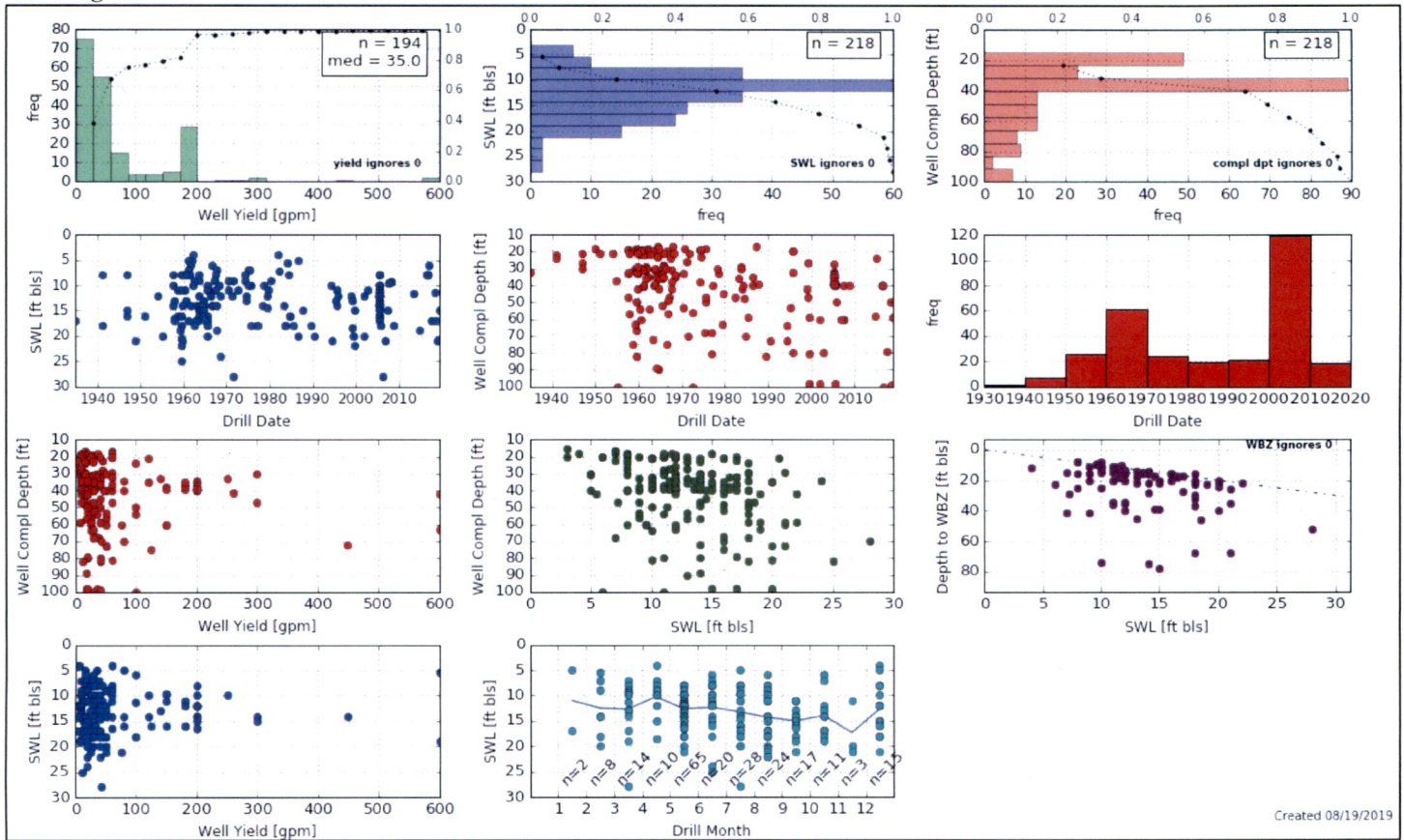
Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	5,040.00	553.00	4,490.00	0.00	1,025.00	3,460.00
FEB	5,850.00	1,250.00	4,600.00	0.00	1,025.00	3,580.00
MAR	5,630.00	1,250.00	4,380.00	0.00	1,025.00	3,350.00
APR	5,020.00	1,310.00	3,710.00	0.00	1,025.00	2,690.00
MAY	4,000.00	808.00	3,190.00	0.00	1,025.00	2,170.00
JUN	2,990.00	408.00	2,580.00	0.00	1,025.00	1,560.00
JUL	2,160.00	389.00	1,770.00	0.00	1,025.00	746.00
AUG	1,790.00	377.00	1,410.00	0.00	1,025.00	388.00
SEP	1,730.00	359.00	1,370.00	0.00	1,025.00	346.00
OCT	1,830.00	328.00	1,500.00	0.00	1,025.00	477.00
NOV	2,850.00	327.00	2,520.00	0.00	1,025.00	1,500.00
DEC	4,450.00	327.00	4,120.00	0.00	1,025.00	3,100.00
ANN	3,560,000.00	461,000.00	3,100,000.00	0.00	743,000.00	2,350,000.00

Well Location Map



Well Log Statistics for the Area



Stream-Depletion Model Results

76 PyHunt stream depletion analysis tool

Application type:	G
Application number:	18750
Well number:	1
Stream Number:	1
Pumping rate (cfs):	0.57
Pumping duration (days):	244.0
Pumping start month number (3=March):	3.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	3980	3980	3980	ft
Aquifer transmissivity	T	10000	50000	80000	ft ² /day
Aquifer storativity	S	0.05	0.01	0.005	-
Aquitard vertical hydraulic conductivity	Kva	0.01	0.01	0.01	ft/day
Not used		20.0	20.0	20.0	
Aquitard thickness below stream	babs	5	5	5	ft
Not used		0.2	0.2	0.2	
Stream width	ws	500	500	500	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	
Depletion (%)	4	9	12	14	17	20	22	24	25	27	20	16
Depletion (cfs)	0.02	0.05	0.07	0.08	0.10	0.11	0.12	0.14	0.14	0.15	0.11	0.09

Hunt (1999) transient stream depletion model

