Groundwater Application Review Summary Form

Application # G- 41779

GW Reviewer J Woody **Date Review Completed:** 4-25-2019

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:

[X] 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.

JW 4/25/19

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).

WATER RESOURCES DEPARTMENT

MEMO 4-25 ,20 19

TO: **Application** G- LL 1779

FROM: **GW:** J Woody
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ YES
The source of appropriation is within or above a Scenic Waterway
☒ NO

☐ YES
Use the Scenic Waterway condition (Condition 7J)
☒ NO

☐ Per ORS 390.835, the Groundwater Section is **able** to calculate ground water interference with surface water that contributes to a Scenic Waterway. The calculated interference is distributed below.

☐ Per ORS 390.835, the Groundwater Section is **unable** to calculate ground water interference with surface water that contributes to a scenic waterway; **therefore, the Department is unable to find that there is a preponderance of evidence that the proposed use will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway.**

DISTRIBUTION OF INTERFERENCE

Calculate the percentage of consumptive use by month and fill in the table below. If interference cannot be calculated, per criteria in 390.835, do not fill in the table but check the "unable" option above, thus informing Water Rights that the Department is unable to make a Preponderance of Evidence finding.

Exercise of this permit is calculated to reduce monthly flows in _____ Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

MEMO

To: Kristopher Byrd, Well Construction and Compliance Section Manager

From: Joel Jeffery, Well Construction Program Coordinator

Subject: Review of Limited License Application LL-1779

Date: April 30, 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 Log.

Applicant's Well #3 (POLK 52307): Based on a review of the Well Report, Applicant's Well #3 seems to protect the groundwater resource.

The construction of Well #3 may not satisfy hydraulic connection issues.

Applicant's Well #4 is a proposed well and therefore there is no Well Log to review.

POLK 52307

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the last page of this form.

WELL I.D. # L 68852
START CARD # 161380

(1) LAND OWNER Well Number WELL #3
Name CITY OF INDEPENDENCE
Address 240 MONMOUTH ST.
City INDEPENDENCE State OR. Zip 97351

(2) TYPE OF WORK
☑ New Well ☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD:
☐ Rotary Air ☐ Rotary Mud ☑ Cable ☐ Auger
☐ Other

(4) PROPOSED USE:
☐ Domestic ☐ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☑ Other Municipal

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☐ No Depth of Completed Well 52 ft.
Explosives used ☐ Yes ☑ No Type ____ Amount ____

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
16"	0'	52'	CEMENT	0'	20'	21 SACKS

How was seal placed: Method ☐ A ☐ B ☑ C ☐ D ☐ E
☐ Other
Backfill placed from 42 ft. to 52 ft. Material 3/8 PEA GRAV.
Gravel placed from 20 ft. to 22 ft. Size of gravel PEA GRAV.

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	12"	+2.67	22'	.250"	☑	☐	☑	☐
	12"	42'	52'	.250"	☑	☐	☑	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☑ None
Final location of shoe(s)

(7) PERFORATIONS/SCREENS:
☐ Perforations Method
☑ Screens Type V-SLOT Material 304 SS

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
22'	32'	100		12"	PS	☐	☐
32'	42'	60		12"	PS	☐	☐
						☐	☐
						☐	☐

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

Yield gal/min	Drawdown	Drill stem at	Time
900	10.5'		5hrs
810	9.83'		3

Temperature of water 56° Depth Artesian Flow Found
Was a water analysis done? ☑ Yes By whom WATERLAB
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata

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MAR 14 2006
WATER RESOURCES DEPT
SALEM, OREGON
OVER THE COUNTER

(9) LOCATION OF WELL by legal description:
County POLK Latitude ____ Longitude ____
Township 8S N or S Range 4W E or W. WM.
Section 21 NW 1/4 SE 1/4
Tax Lot 100 Lot ____ Block ____ Subdivision ____
Street Address of Well (or nearest address) In well field east of Junction of POLK St & S. RIVER Dr. 200'S. of #2 WELL

(10) STATIC WATER LEVEL:
14'-8" ft. below land surface. Date 02-15-06
Artesian pressure ____ lb. per square inch Date ____

(11) WATER BEARING ZONES:
Depth at which water was first found 19'

From	To	Estimated Flow Rate	SWL
22'	42'	800+ GPM	14.67'

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
Brown clay	0'	7'	
Brown sandy clay	7'	19'	
Gravel, small-med w/some coarse br. sand - W.B.	19'	39'	14.8
Gravel w/ fine sand - brown	39'	41'	14.8
Brown sand w/small gravel	41'	43'	
Small gravel w/ black sand and wood	43'	44'	
Black fine-medium-coarse sand w/ small gravel + wood	44'	50'	
Blue clay w/ gravel	50'	52'	

Date started NOV. 23, '05 Completed FEB. 20, 2006

(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 633
Signed Michael Waldrop Date FEB. 28, 06

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

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 4/25/2019

FROM: Groundwater Section Jen Woody
Reviewer's Name

SUBJECT: Application LL- 1779 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: **City of Independence** County: **Polk**

A1. Applicant(s) seek(s) 2.5 cfs from 2 well(s) in the Willamette Basin, Main Stem Willamette subbasin

A2. Proposed use municipal Seasonality: year-round

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	POLK 52307	3	Alluvial	2.5	T8S/R4W-21 NW ¼ SE ¼	2000' N, 2080' W fr SE cor S 21
2	proposed	4	Alluvial	2.5	T8S/R4W-21 SE ¼ NE ¼	1500' S, 480' W fr NE cor S 21
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	150	19	14.66	02/15/2006	52	0-20	0-52	n/a	22-42	900	10.5	pump
2	150	*	15*	*	60	0-20	0-30	n/a	30-50	unk	unk	n/a

Use data from application for proposed wells.

A4. **Comments:** *Well 2 is not yet drilled, water level is expected to be similar to that reported by POLK 52307, due to proximity and similar proposed construction and total depth.

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: 690-502-240 applies to groundwater in unconfined alluvium within ¼ mile of a surface water source, so the proposed groundwater use will be affected by this rule.

A6. ☐ **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: N/A
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) **Large Water Use Reporting, 7N**;
   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 points of appropriation will develop water from unconfined, course-grained alluvial flood deposits that have a saturated thickness of 20-40 feet (Conlon et al., 2005). Water levels in the aquifer are closely tied to stream stage in the Willamette River (Conlon et al., 2005). Long term water level data are sparse in this area, but there is no evidence of regional decline (see Figure 3). The proximity and hydraulic connection to the river will likely prevent long term groundwater level declines at the subject wells.

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**	☐	☒
2	**Alluvium**	☐	☒
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The wells are located within the unconfined alluvial flood deposits of the Willamette River (Conlon et al., 2005).

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

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	1	**Willamette River**	**150**	**135-150**	**330**	☒	☐	☐	☒	☐
2	1	**Willamette River**	**150**	**135-150**	**240**	☒	☐	☐	☒	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: The water level at the subject wells is above or coincident with the river level, indicating hydraulic connection.

Water Availability Basin the well(s) are located within: 183: WILLAMETTE R> COLUMBIA R- AB MILL CR AT GAGE 14191000

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	☒	☐	**MF 183**	**1300**	☐	**3620**	☐	**>>25%**	☒
2	1	☒	☐	**MF 183**	**1300**	☐	**3620**	☐	**>>25%**	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: The interference at 30 days was estimated using the Hunt 1999 model (unconfined aquifer with a streambed clogging layer) and assuming a 3 foot streambed clogging layer. A transmissivity value range from 30,000 – 90,000 ft^2/day was estimated based on single well pump tests from nearby wells which are similarly located in the meander belt/flood deposits of the Willamette River (POLK 3713 , POLK 3714). PSI is triggered.

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													
		%	%	%	%	%	%	%	%	%	%	%	%
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: N/A

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:**

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 Report 2005-5168.

Gannett, M.W. and Caldwell, R.R., 1998. Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington; U.S. Geological Survey Professional Paper 1424-A.

Hunt, B., 1999. Unsteady stream depletion from ground water pumping: Groundwater, v. 37, no. 1, p. 98-102.

OWRD well logs, water level and pump test data .

USGS Topographic map, Monmouth and Rickreall Quadrangles.

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

Water Availability Analysis

Detailed Reports

WILLAMETTE R > COLUMBIA R - AB MILL CR AT GAGE 14191000

WILLAMETTE BASIN

Water Availability as of 4/24/2019

Watershed ID #: 183 (Map) Exceedance Level:80%

Date: 4/24/2019 Time: 9:10 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	18,400.00	2,240.00	16,200.00	0.00	1,300.00	14,900.00
FEB	20,100.00	7,430.00	12,700.00	0.00	1,300.00	11,400.00
MAR	19,600.00	7,210.00	12,400.00	0.00	1,300.00	11,100.00
APR	18,000.00	6,870.00	11,100.00	0.00	1,300.00	9,830.00
MAY	15,500.00	4,170.00	11,300.00	0.00	1,300.00	10,000.00
JUN	8,310.00	1,690.00	6,620.00	0.00	1,300.00	5,320.00
JUL	4,710.00	1,450.00	3,260.00	0.00	1,300.00	1,960.00
AUG	3,620.00	1,330.00	2,290.00	0.00	1,300.00	991.00
SEP	3,680.00	1,150.00	2,530.00	0.00	1,300.00	1,230.00
OCT	4,650.00	743.00	3,910.00	0.00	1,300.00	2,610.00
NOV	9,400.00	852.00	8,550.00	0.00	1,300.00	7,250.00
DEC	16,700.00	912.00	15,800.00	0.00	1,300.00	14,500.00
ANN	13,500,000.00	2,150,000.00	11,300,000.00	0.00	942,000.00	10,400,000.00

Figure 2. Well Location Map

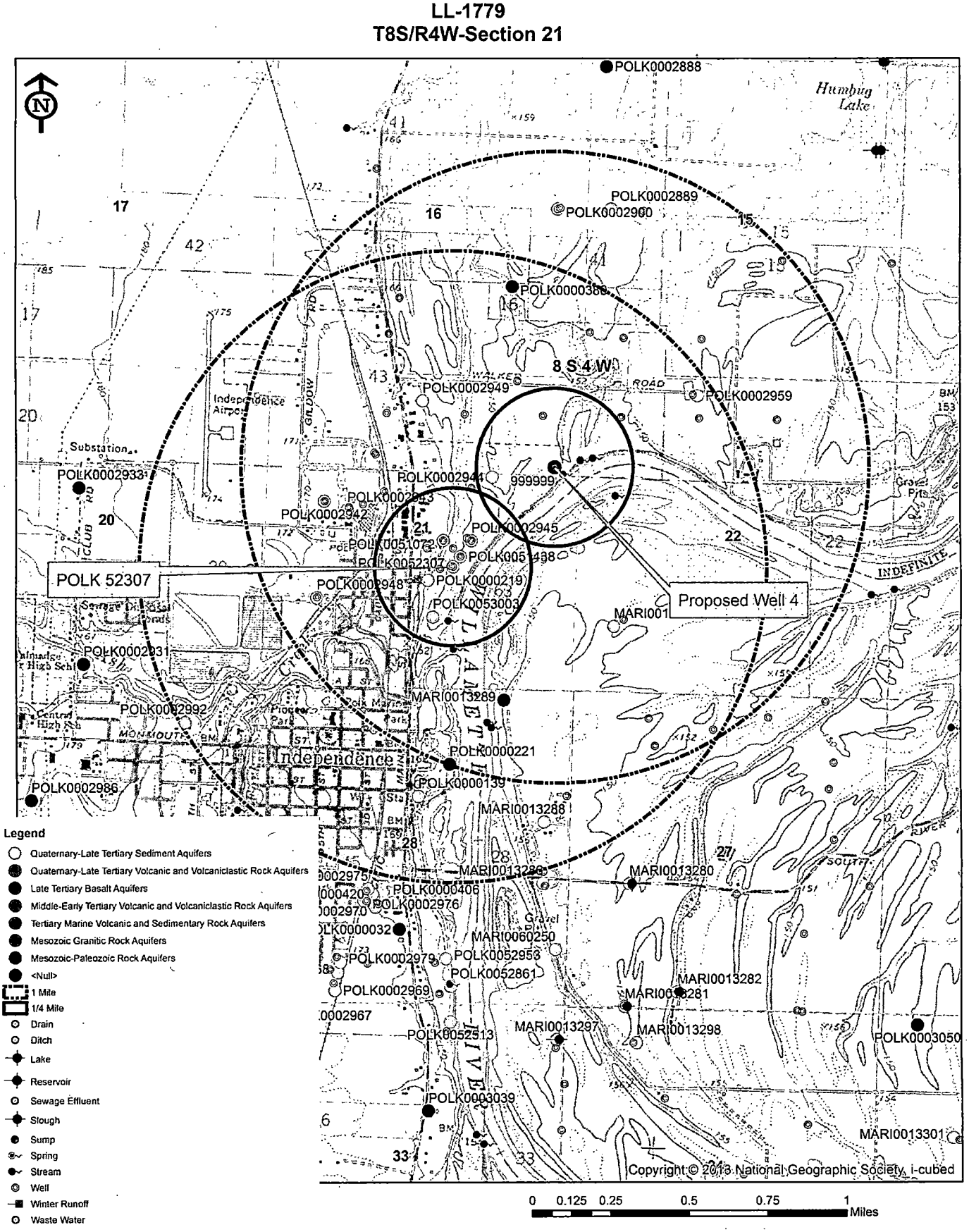


Figure 3. Water-Level Trends in Nearby Wells

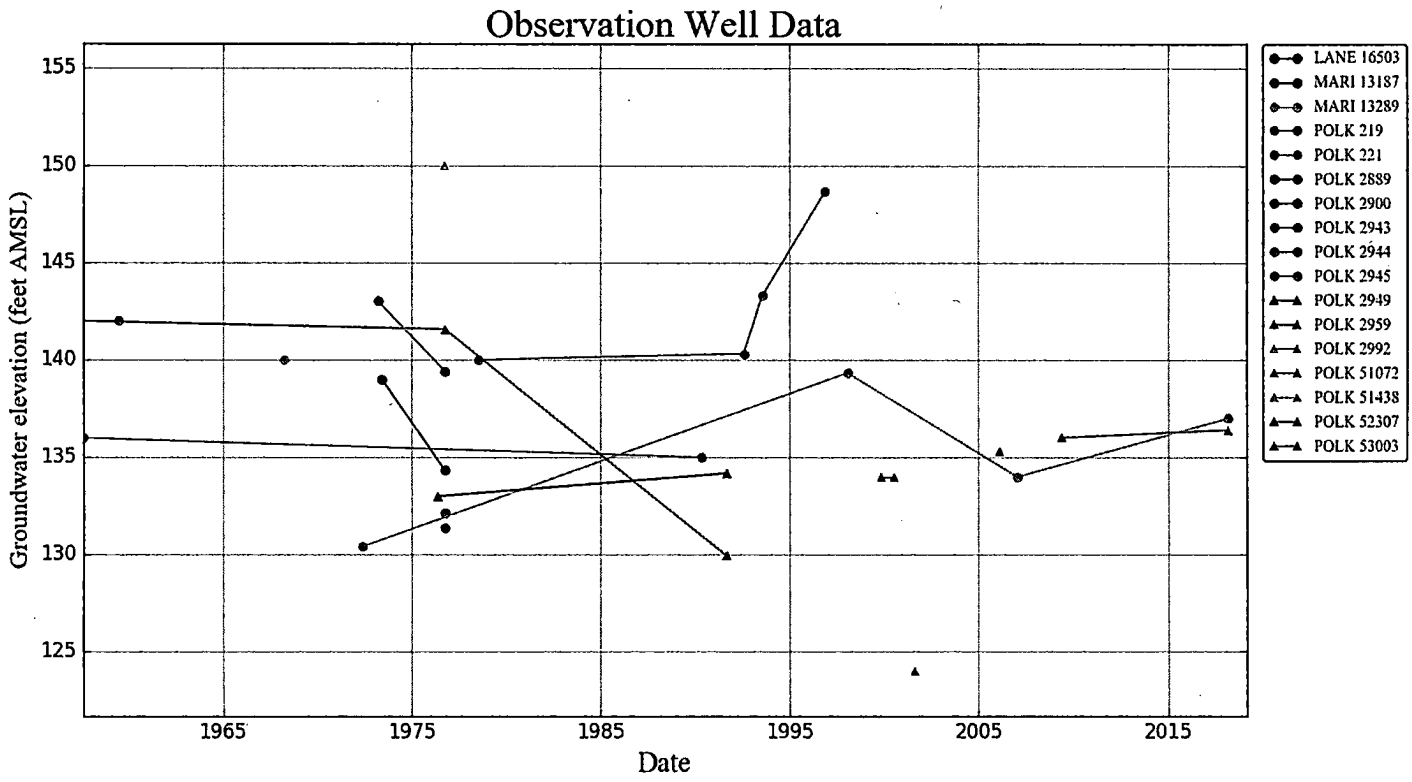
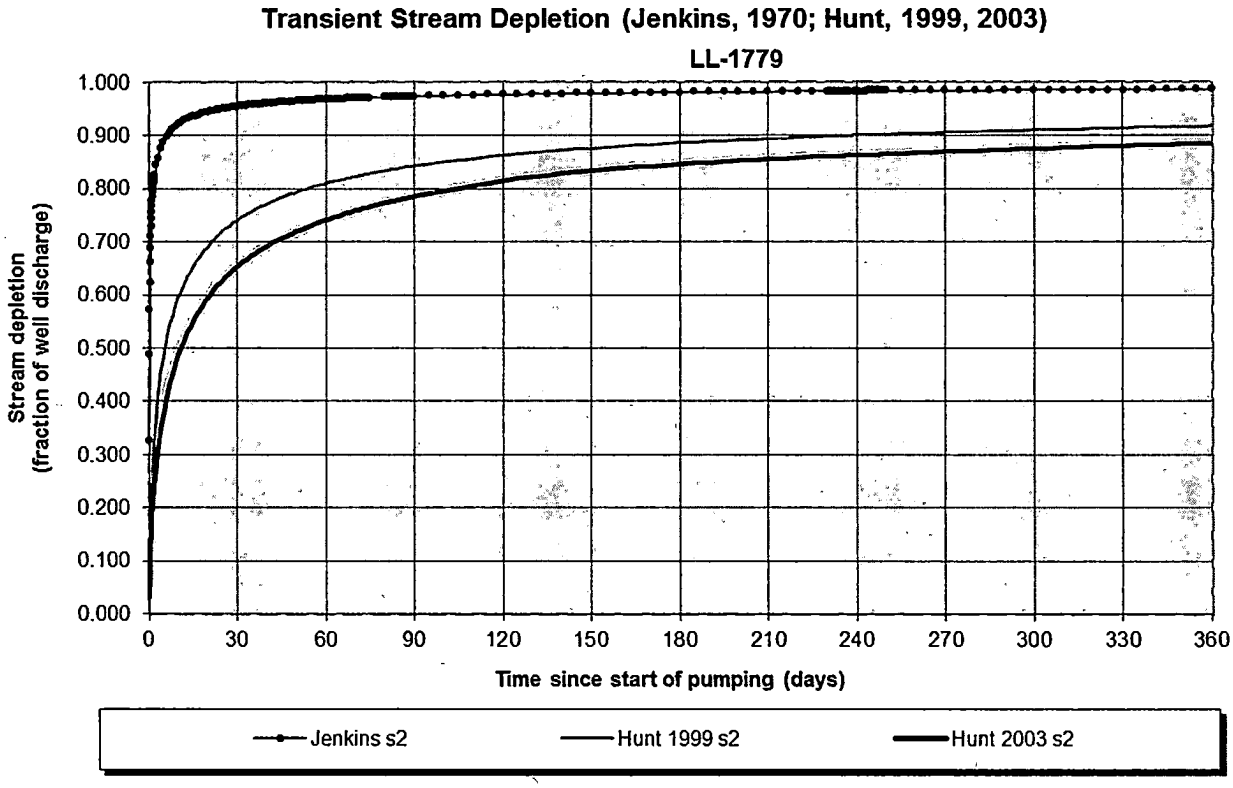


Figure 4. Stream Depletion



Output for Stream Depletion, Scenerio 2 (s2):						Time pump on (pumping duration) = 365 days						
Days	30	60	90	120	150	180	210	240	270	300	330	360
J SD	95.5%	96.8%	97.4%	97.7%	98.0%	98.2%	98.3%	98.4%	98.5%	98.6%	98.6%	98.7%
H SD 1999	74.1%	81.0%	84.3%	86.3%	87.7%	88.7%	89.5%	90.1%	90.6%	91.1%	91.5%	91.8%
H SD 2003	65.35%	74.13%	78.57%	81.50%	83.40%	84.67%	85.58%	86.30%	86.96%	87.57%	88.11%	88.58%
Qw, cfs	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
H SD 99, cfs	1.853	2.026	2.108	2.157	2.191	2.217	2.237	2.253	2.266	2.277	2.287	2.295
H SD 03, cfs	1.634	1.853	1.964	2.038	2.085	2.117	2.140	2.158	2.174	2.189	2.203	2.215

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	2.50	2.50	2.50	cfs
Time pump on (pumping duration)	tpon	365	365	365	days
Perpendicular from well to stream	a	240	240	240	ft
Well depth	d	60	60	60	ft
Aquifer hydraulic conductivity	K	1000	2000	3000	ft/day
Aquifer saturated thickness	b	30	30	30	ft
Aquifer transmissivity	T	30000	60000	90000	ft*ft/day
Aquifer storativity or specific yield	S	0.2	0.2	0.2	
Aquitard vertical hydraulic conductivity	Kva	0.5	0.5	0.5	ft/day
Aquitard saturated thickness	ba	3	3	3	ft
Aquitard thickness below stream	babs	3	3	3	ft
Aquitard porosity	n	0.2	0.2	0.2	
Stream width	ws	580	580	580	ft