

MEMO

TO: Application G- 18253

☒ YES

☐ NO☒ YES☐ NO[illegible]

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date March 1, 2016

FROM: Groundwater Section Michael J. Thoma
Reviewer's Name

SUBJECT: Application G- 18253 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: Gregg Brooks County: Josephine

A1. Applicant(s) seek(s) 0.045 cfs from 1 well(s) in the Rogue Basin,
Illinois River subbasin

A2. Proposed use Nursery (4 ac) 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	PROP	1	Alluvium ^A	0.045	39S/07W-28 NESW	1346'N, 207'W of S ¼ cor S 28
2						

* 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	1550		10-20 ^B		140							

Use data from application for proposed wells.

A4. **Comments:** ^AThe applicant did not provide a proposed aquifer or depth for the POA, only a drilling cost estimate sheet for a 140 ft deep well. The reviewer will assume the well will be no greater than 140 ft deep. A cursory review of well logs in the area suggests the underlying geology contains ~100 ft of alluvium overlying dense bedrock. The alluvium is the more productive aquifer so the reviewer further assumes that the well will be producing from the alluvium.

^BSWL is estimated from reported SWLs on driller's logs in the area

A5. ☒ **Provisions of the** Rogue (OAR 690-515) 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) '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:** The applicant's proposed well is located < 1 mile from a OWRD State Observation Well (JOSE 6089 – a 75 ft deep well producing from alluvium) which shows stable water levels over the past 25 yrs. There are a few other wells in the Illinois Valley with SWL data and they also show stable water levels. There are a few groundwater POAs in the area of the proposed well but given the low rate proposed and the alluvial nature of the aquifer, well interference and injury is unlikely for the proposed use.
- _____
- _____
- _____
- _____

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 of Illinois Valley	☒	☐
		☐	☐

Basis for aquifer confinement evaluation: Most well logs in the area report 'first water' between 50 and 90 ft but SWLs between 10 and 30 ft – implying 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	Sucker Cr	1540	1520-1560	2000	☒	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: coincident SW and GW elevations

Water Availability Basin the well(s) are located within Althouse Cr > E Fk Illinois R – At Mouth;
but hydraulically connected to: Sucker Cr > E Fk Illinois R – At Mouth (ID# 69808)

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	☐	☐	IS69808	54	☐	25.9	☐	<< 25%	☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

Comments: Interference at 30 d was estimated using the Hunt (2003) analytical model with typical parameter values for coarse alluvial aquifer material (i.e., high transmissivity). Results imply that interference will be insignificant for the proposed use.

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?
		☐			☐		☐		☐

- 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													
(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: _____

- 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:
- ☐ The permit should contain condition #(s) _____;
 - ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:** _____

References Used:

Hunt, B. 2003. *Unsteady Stream Depletion when Pumping from a Semiconfined Aquifer*. Journal of Hydrologic Engineering. Vol 8(1), pp 12-19

OWRD Well Log Database – accessed 03/01/2015

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**

SUCKER CR > E FK ILLINOIS R - AT MOUTH
 ROGUE BASIN

Water Availability as of 3/1/2016

Watershed ID #: 69808 ([Map](#))

Exceedance Level: 80% ▾

Date: 3/1/2016

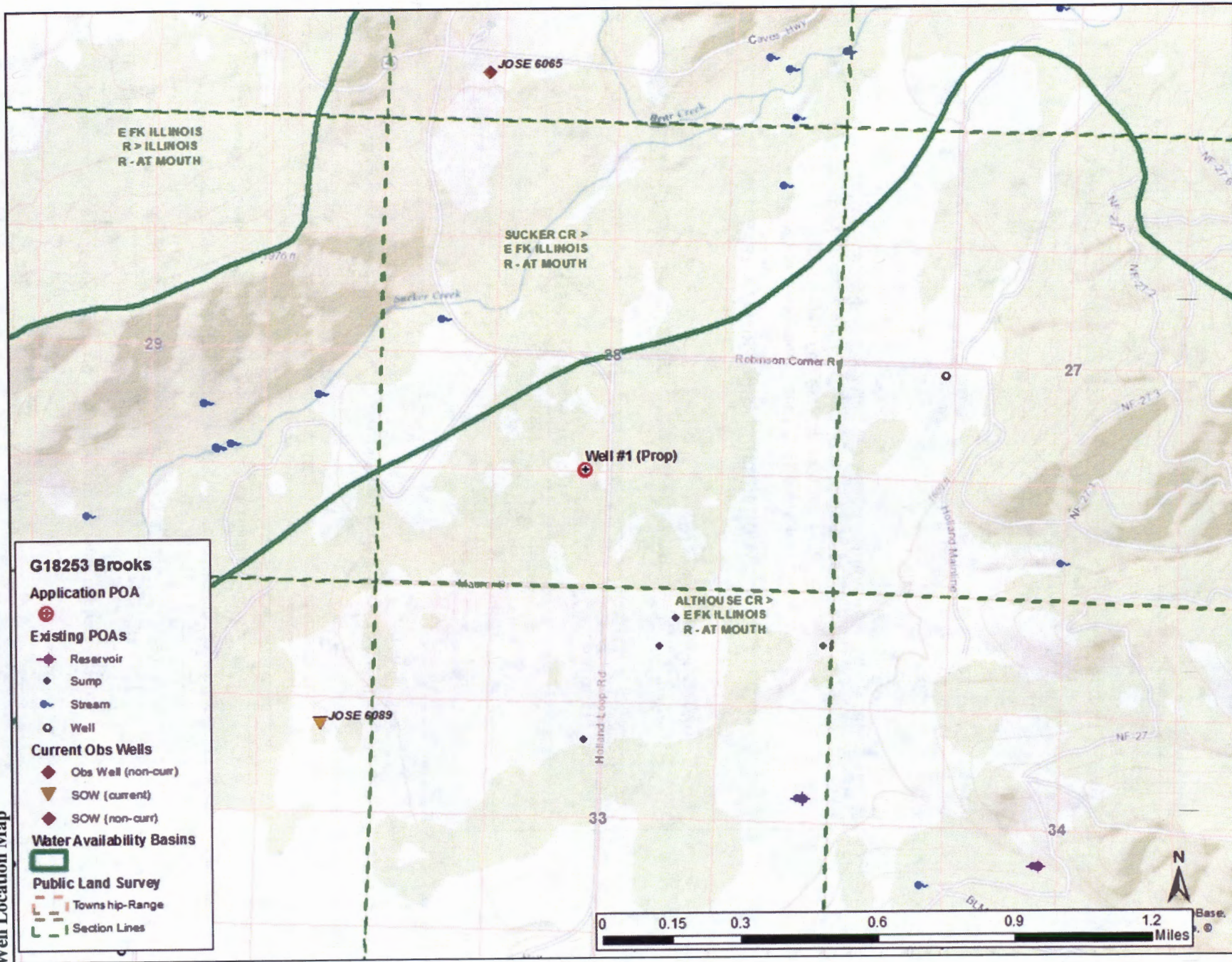
Time: 12:50 PM

Water Availability Calculation**Consumptive Uses and Storages****Instream Flow Requirements****Reservations****Water Rights****Watershed Characteristics****Water Availability Calculation**

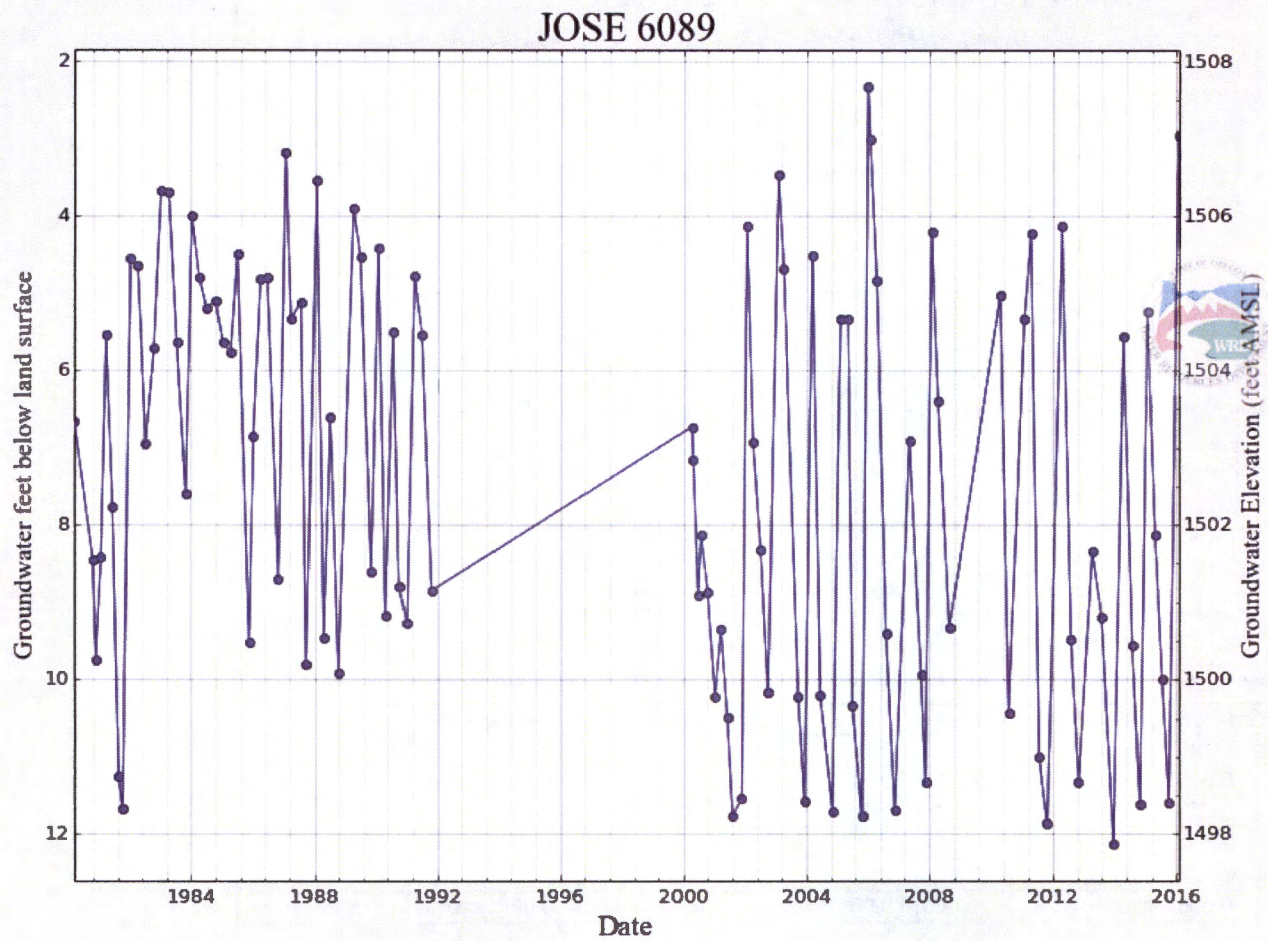
Monthly Streamflow in Cubic Feet per Second
 Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	132.00	0.17	132.00	0.00	135.00	-3.17
FEB	221.00	0.19	221.00	0.00	135.00	85.80
MAR	220.00	0.19	220.00	0.00	135.00	84.80
APR	215.00	2.57	212.00	0.00	135.00	77.40
MAY	162.00	4.02	158.00	0.00	135.00	23.00
JUN	79.70	5.58	74.10	0.00	80.00	-5.88
JUL	42.60	7.44	35.20	0.00	54.00	-18.80
AUG	30.40	6.15	24.20	0.00	54.00	-29.80
SEP	25.90	4.05	21.80	0.00	80.00	-58.20
OCT	26.10	1.37	24.70	0.00	80.00	-55.30
NOV	36.80	0.14	36.70	0.00	135.00	-98.30
DEC	77.30	0.14	77.20	0.00	135.00	-57.80
ANN	134,000.00	1,940.00	132,000.00	0.00	77,900.00	64,400.00

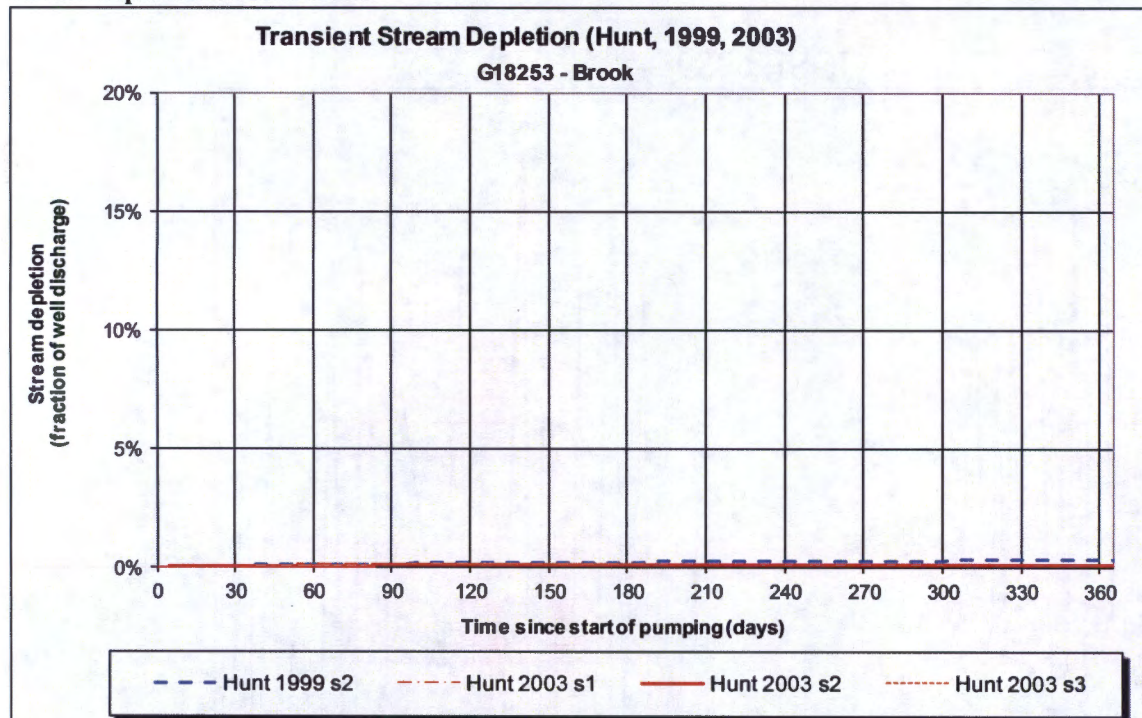
Well Location Map



Water-Level Trends in Nearby Wells



Stream-depletion Model Results



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
Qw, cfs	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045
J SD	85.5%	89.7%	91.6%	92.7%	93.5%	94.1%	94.5%	94.9%	95.1%	95.4%	95.6%	95.8%
H SD 1999	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.3%	0.3%	0.4%
H SD 2003	0.07%	0.09%	0.10%	0.10%	0.11%	0.11%	0.11%	0.11%	0.12%	0.12%	0.12%	0.12%
H SD 03, cfs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	0.05	0.05	0.05	cfs
Time pump on (pumping duration)	tpon	365	365	365	days
Perpendicular from well to stream	a	2000	2000	2000	ft
Well depth	d	140	140	140	ft
Aquifer hydraulic conductivity	K	50	200	500	ft/day
Aquifer saturated thickness	b	100	100	100	ft
Aquifer transmissivity	T	5000	20000	50000	ft*ft/day
Aquifer storativity or specific yield	S	0.01	0.01	0.01	
Aquitard vertical hydraulic conductivity	Kva	0.001	0.001	0.001	ft/day
Aquitard saturated thickness	ba	5	5	5	ft
Aquitard thickness below stream	babs	3	3	3	ft
Aquitard porosity	n	0.15	0.15	0.15	
Stream width	ws	15	15	15	ft
Streambed conductance (lambda)	sbc	0.005	0.005	0.005	ft/day
Stream depletion factor	sdf	8.000	2.000	0.800	days
Streambed factor	sbf	0.002	0.001	0.000	
input #1 for Hunt's Q_4 function	t'	0.125	0.500	1.250	
input #2 for Hunt's Q_4 function	K'	0.160	0.040	0.016	
input #3 for Hunt's Q_4 function	epsilon'	0.067	0.067	0.067	
input #4 for Hunt's Q_4 function	lamda'	0.002	0.001	0.000	