PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: Water Rights Section   Date __**May 11, 2010**__

FROM: Ground Water/Hydrology Section ____Karl Wozniak____
                                                                    Reviewer's Name
SUBJECT: Application G-__17302__   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 ground water 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: _David Thompson & Kathleen Sowa_   County: _Multnomah_

A1.   Applicant(s) seek(s) __0.111__ cfs from __1__ well(s) in the __Willamette River__ Basin,

_____ subbasin   Quad Map:__Sauvie Island__

A2.   Proposed use _____Irrigation_____   Seasonality: ____March 1 – October 31____
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	**MULT 1610**		**Alluvium**	**0.111**	**2N/1W-7 NE/SE**	**340' S, 1090' W fr E1/w 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	**45**	**105**	**35**	**9/24/1980**	**120**	**0-20**	**-1-119**			**60**		**Air**

Use data from application for proposed wells.

A4.   **Comments:** The applicant proposes to irrigate 8 acres using a maximum rate of 50 gpm (0.111 cfs) and a maximum annual use of 15 acre feet.

_____

_____

A5. ☒ **Provisions of the Willamette_____** Basin rules relative to the development, classification and/or management of ground water hydraulically connected to surface water ☐ **are**, *or* ☒ **are not**, activated by this application. (Not all basin rules contain such provisions.)
Comments: The well is greater than ¼-mile from the nearest stream so the pertinent rules do not apply.

_____

_____

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

_____

_____

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

B1. **Based upon available data**, I have determined that <u>ground water</u>* 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 ground water 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 ground water 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 ground water resource; or

d. ☐ **will, if properly conditioned**, avoid injury to existing ground water rights or to the ground water 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 ground water production from no deeper than _____ ft. below land surface;

b. ☐ **Condition** to allow ground water production from no shallower than _____ ft. below land surface;

c. ☒ **Condition** to allow ground water production only from the _____**alluvial**_____ ground water 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 Ground Water 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. **Ground water availability remarks:**   The well produces from an unconfined alluvial aquifer that consists of over 200 feet of predominantly coarse-grained Holocene floodplain and Pleistocene Missoula flood sediments adjacent to the Multnomah Channel of the Willamette River. The water table occurs within 20 feet of land surface. The great aquifer thickness, the expected large storativity (probably 0.2), and the presence of nearby surface water sources suggest that groundwater supply is unlikely to be a problem in this area.
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C. **GROUND WATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040**

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**Alluium**	☐	☒
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Coarse-grained sediments in the floodplain of a major river suggest that the aquifer system is largely unconfined.

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**	**Multnomah Channel**	**10**	**10**	**1600**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Published water table maps and report indicate that the alluvial aquifer is hydraulically connected to local streams in the area. Since the Multnomah channel is likely to approximate a fully penetrating steam, the cone of depression is unlikely to expand to interfere with other surface water sources. Therefore, the Multnomah Channel is likely to be the only surface water source that will be impacted by pumping from the well.

Water Availability Basin the well(s) are located within: **The well is effectively within the Columbia River basin and does not plot within an existing WAB.**

C3a. **690-09-040 (4):** Evaluation of stream impacts for <u>each well</u> 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**	☐	☐			☐		☐	**62**	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

C3b. **690-09-040 (4):** Evaluation of stream impacts <u>by total appropriation</u> 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 Hunt 1999 model was used to estimate stream depletion.___

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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													

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

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_____

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_____

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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 ground water 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**_____

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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.

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

McFarland, W.D., and Morgan, D.S., 1966, A description of the ground-water flow system in the Portland Basin, Oregon and Washington: U.S. Geological Survey Water-Supply Paper 2470-A, 58 p.

Morgan, D.S., and McFarland, W.D., 1996, Simulation analysis of the ground-water flow system in the Portland Basin, Oregon and Washington: U.S. Geological Survey Water-Supply Paper 2470-B, 83 p.

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.

D. <u>WELL CONSTRUCTION, OAR 690-200</u>

D1.　　**Well #**: _____　　　　**Logid:** _____

D2.　　**THE WELL does not 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**:
　　　　a.　☐　constitutes a health threat under Division 200 rules;
　　　　b.　☐　commingles water from more than one ground water reservoir;
　　　　c.　☐　permits the loss of artesian head;
　　　　d.　☐　permits the de-watering of one or more ground water reservoirs;
　　　　e.　☐　other: (specify) _____

D4.　　**THE WELL construction deficiency is described as follows:** _____
　　　　_____
　　　　_____
　　　　_____
　　　　_____
　　　　_____

D5.　　**THE WELL**　　a.　☐　**was**, *or* ☐ **was not** constructed according to the standards in effect at the time of
　　　　　　　　　　　　　　original construction or most recent modification.

　　　　　　　　　　　b.　☐　 I don't know if it met standards at the time of construction.

D6.　☐　**Route to the Enforcement Section.** I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Enforcement Section and the Ground Water Section.
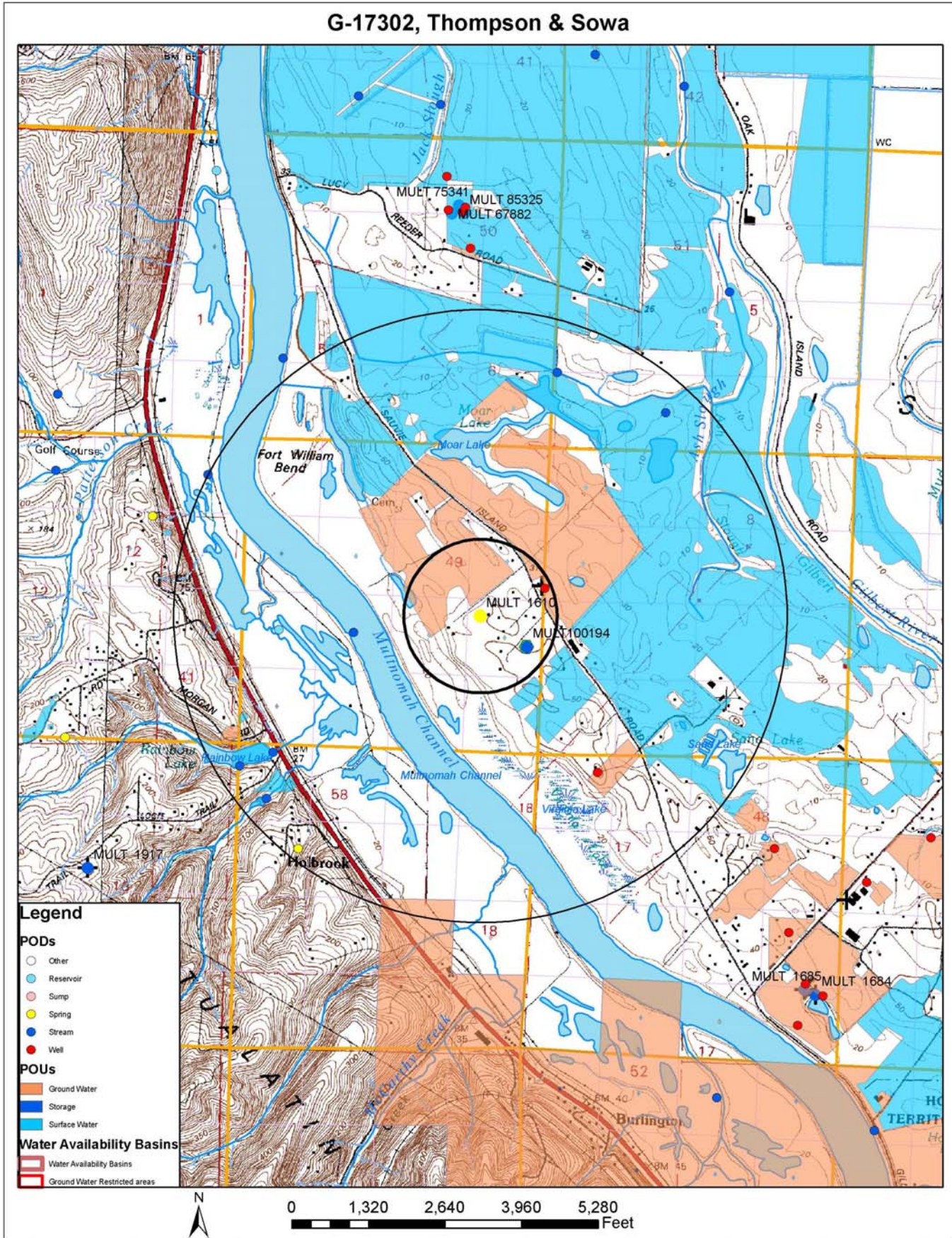

THIS SECTION TO BE COMPLETED BY ENFORCEMENT PERSONNEL

D7.　☐ Well construction deficiency has been corrected by the following actions: _____
　　　_____
　　　_____
　　　_____
　　　_____
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　　　_____

_____　　　　　_____ , 200_____ .
　　　　(Enforcement Section Signature)

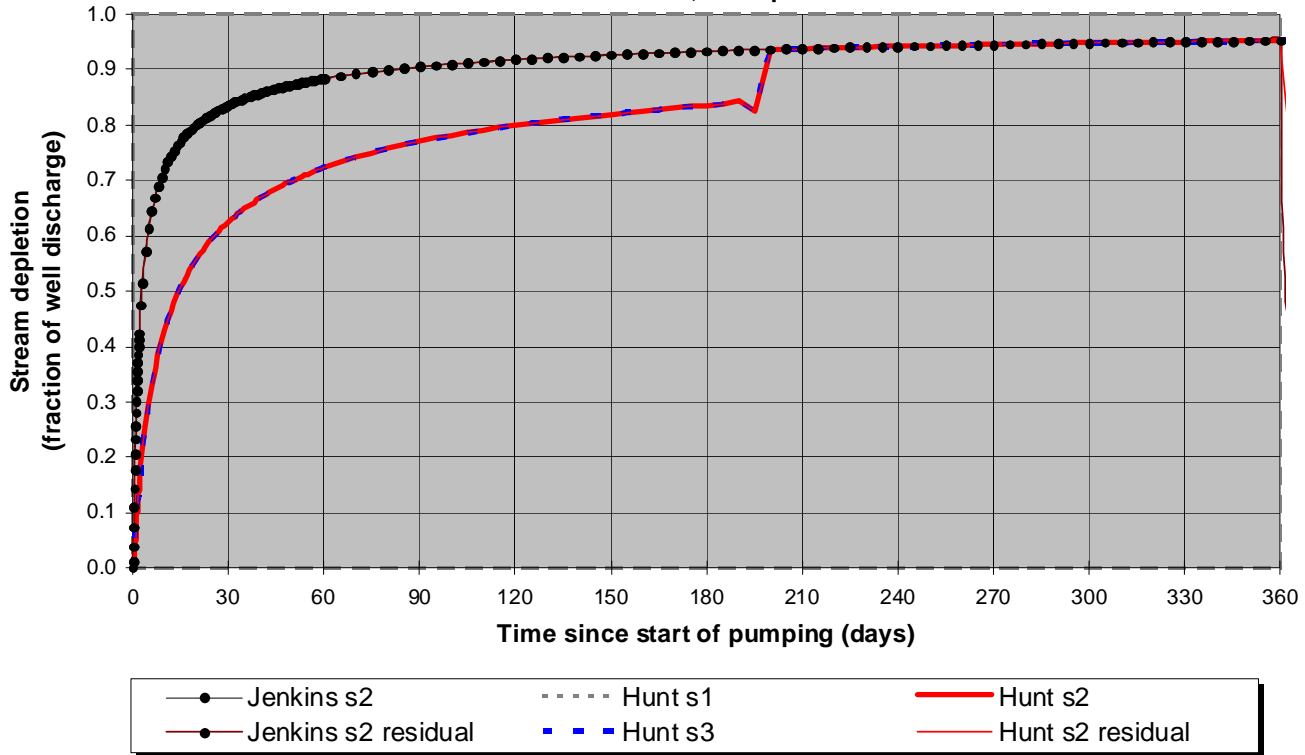D8.　☐　**Route to Water Rights Section (attach well reconstruction logs to this page).**

Well Location Map

G-17302, Thompson & Sowa

Stream Interference Analysis

Transient Stream Depletion (Jenkins, 1970; Hunt, 1999)
G-17302, Thompson & Sowa

Legend:
- Jenkins s2
- Jenkins s2 residual
- Hunt s1
- Hunt s3
- Hunt s2
- Hunt s2 residual

Output for Hunt Stream Depletion, Scenerio 2 (s2):   Time pump on = 360 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111	0.111
Jenk SD %	0.836	0.884	0.905	0.918	0.926	0.933	0.938	0.942	0.945	0.948	0.950	0.952
Jen SD cfs	0.093	0.098	0.100	0.102	0.103	0.104	0.104	0.105	0.105	0.105	0.105	0.106
Hunt SD %	0.625	0.723	0.770	0.799	0.820	0.836	0.938	0.942	0.945	0.948	0.950	0.952
Hunt SD cfs	0.069	0.080	0.085	0.089	0.091	0.093	0.104	0.105	0.105	0.105	0.105	0.106

Parameters:			Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw		0.111	0.111	0.111	cfs
Distance to stream	a		1600	1600	1600	ft
Aquifer hydraulic conductivity	K		1000	1000	1000	ft/day
Aquifer thickness	b		200	200	200	ft
Aquifer transmissivity	T		200000	200000	200000	ft*ft/day
Aquifer storage coefficient	S		0.2	0.2	0.2	
Stream width	ws		500	500	500	ft
Streambed hydraulic conductivity	Ks		1	1	1	ft/day
Streambed thickness	bs		3	3	3	ft
Streambed conductance	sbc		166.6666667	166.6666667	166.6666667	ft/day
Stream depletion factor (Jenkins)	sdf		2.56	2.56	2.56	days
Streambed factor (Hunt)	sbf		1.333333333	1.333333333	1.333333333	