

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date February 10, 2014
 FROM: Groundwater Section Marc Norton
Reviewer's Name
 SUBJECT: Application G- 17738 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: Madison Ranches - Jack Madison County: Umatilla

- A1. Applicant(s) seek(s) 22.3 cfs from 7 well(s) in the Morrow (Wells & Land) & Umatilla (Land) Basin, _____ subbasin Quad Map: _____
- A2. Proposed use Irrigation [8461acs (P) & 787.6acs (S)] 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	Proposed	1	Sand & Gravel	22.3	04N/25E-01 SE SW	1230' N, 1330' E fr SW cor S 1
2	Proposed	2	Sand & Gravel	22.3	04N/25E-01 SW SE	120' N, 2500' E fr SW cor S 1
3	Proposed	3	Sand & Gravel	22.3	04N/25E-01 NW SE	1500' N, 2660' E fr SW cor S 1
4	Proposed	4	Sand & Gravel	22.3	04N/25E-01 SW NE	2878' N, 3120' E fr SW cor S 1
5	Proposed	5	Sand & Gravel	22.3	04N/25E-12 NW NE	740' S, 1860' W fr NE cor S 12
6	Proposed	6	Sand & Gravel	22.3	04N/25E-12 NW NE	150' S, 1780' W fr NE cor S 12
7	Proposed	7	Sand & Gravel	22.3	04N/25E-01 NE SE	2500' N, 100' W fr SE cor S 1

* 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	321				80	0-18	0-40		40-80			
2	319				80	0-18	0-40		40-80			
3	321				80	0-18	0-40		40-80			
4	315				80	0-18	0-40		40-80			
5	325				80	0-18	0-40		40-80			
6	325				80	0-18	0-40		40-80			
7	331				80	0-18	0-40		40-80			

Use data from application for proposed wells.

A4. **Comments:** The applicant proposes to pump groundwater from seven wells completed in the alluvial deposits near the Columbia River; the water will irrigate land approximately 10 to 20 miles southeast. Most of the water would be used as primary irrigation but there is some supplemental also.

Requested discharge rate is 10,000 gpm = 22.3 cfs.

A5. **Provisions of the Umatilla River** _____ 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: The wells are located outside of the Ordnance Gravel Critical Groundwater Area.

B. GROUND WATER 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 ground water 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) 7B – Interference, 7P – Well Tag, 7T – Measuring Tube, Large measuring and reporting with flow meter on each well;
 - 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 above the Columbia River Basalts;
- d. Condition to allow production only from a single aquifer in the Columbia River Basalt;
- e. 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 proposed wells will develop water from a coarse grained alluvial deposit overlying the Columbia River Basalts. The sands and gravels thin rapidly to the south. Wells 2, 5 and 6 are located about 1000 feet north of the thinning of the alluvial deposit. This will increase drawdowns, reduce yields, and push the cone of depression towards the river. A stream depletion model was run to determine possible impacts to the Columbia River from pumping the wells. The first run was done pumping 10,000 gpm from well 1, the closest well to the river. The second run was done pumping 10,000 gpm from well 7, the well located the farthest from the river. The results are shown on page 7 and 8 of the review.

Special Permit Condition: The permittee shall construct two minimum six-inch diameter observation wells to penetrate the same aquifer as the production wells. The wells shall meet the Department’s minimum well construction standards and shall be cased and sealed to the same depth as the production wells. The wells shall be constructed at a location approved by the Department for the purpose of instrumentation with continuous water-level monitoring equipment. The landowner or permittee shall provide access to Department staff to install and maintain the monitoring equipment. The wells shall not be used for any other purpose while the Department is monitoring water levels. The wells shall be completed prior to water use under the terms of any permit issued.

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 - 7	Sand and gravels	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer confinement evaluation: Groundwater levels are at the depth where water was encountered in nearby wells.

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	Columbia River	290	267	5676	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Columbia River	290	267	7500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	1	Columbia River	290	267	6500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	1	Columbia River	290	267	6050	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	1	Columbia River	290	267	8500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	1	Columbia River	290	267	8300	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	1	Columbia River	290	267	7900	<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"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Basis for aquifer hydraulic connection evaluation: All seven well locations are over one mile from the Columbia River.

Water Availability Basin the well(s) are located within: Columbia River

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?
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<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?
		<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

Comments: All seven well locations are over one mile from the Columbia River.

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	1	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
2	1	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
3	1	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
4	1	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
5	1	%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
6	1	%	%	%	%	%	%	%	%	%	%	%	%
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: Estimated interference with the Columbia River is about 10 to 12 cfs after 120 days of pumping.

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 :** The proposed wells will develop water from a coarse grained alluvial deposit overlying the Columbia River Basalts. The sands and gravels thin rapidly to the south. Wells 2, 5 and 6 are located about 1000 feet north of the thinning of the alluvial deposit. This will increase drawdowns, reduce yields, and push the cone of depression towards the river. A stream depletion model was run to determine possible impacts to the Columbia River from pumping the wells. The first run was done pumping 10,000 gpm from well 1, the closest well to the river. The second run was done pumping 10,000 gpm from well 7, the well located the farthest from the river. The results are shown on page 7 and 8 of the review. The estimated interference is about 10 to 12 cfs after 120 days of pumping.

References Used: OWRD Stream Depletion Model, Wozniak, 2008 (after Jenkins, 1970 and Hunt, 1999)

D. WELL CONSTRUCTION, OAR 690-200

D1. Well #: _____ Logid: _____

D2. **THE WELL does not appear to meet current well construction standards based upon:**

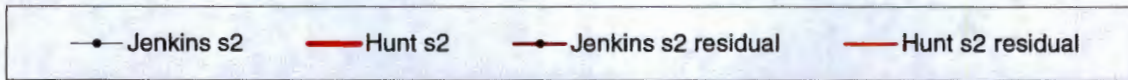
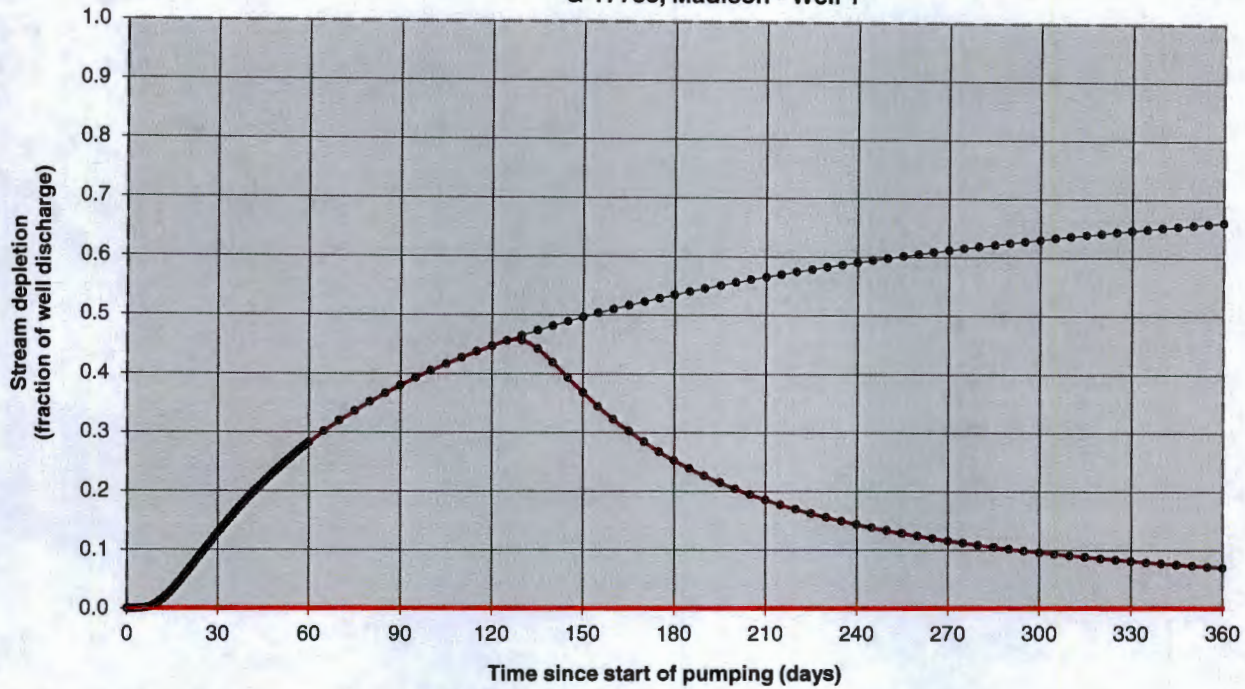
- a. review of the well log;
- b. field inspection by _____;
- c. report of CWRE _____;
- d. other: (specify) _____

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.**

Transient Stream Depletion (Jenkins, 1970; Hunt, 1999)

G-17738, Madison - Well 1



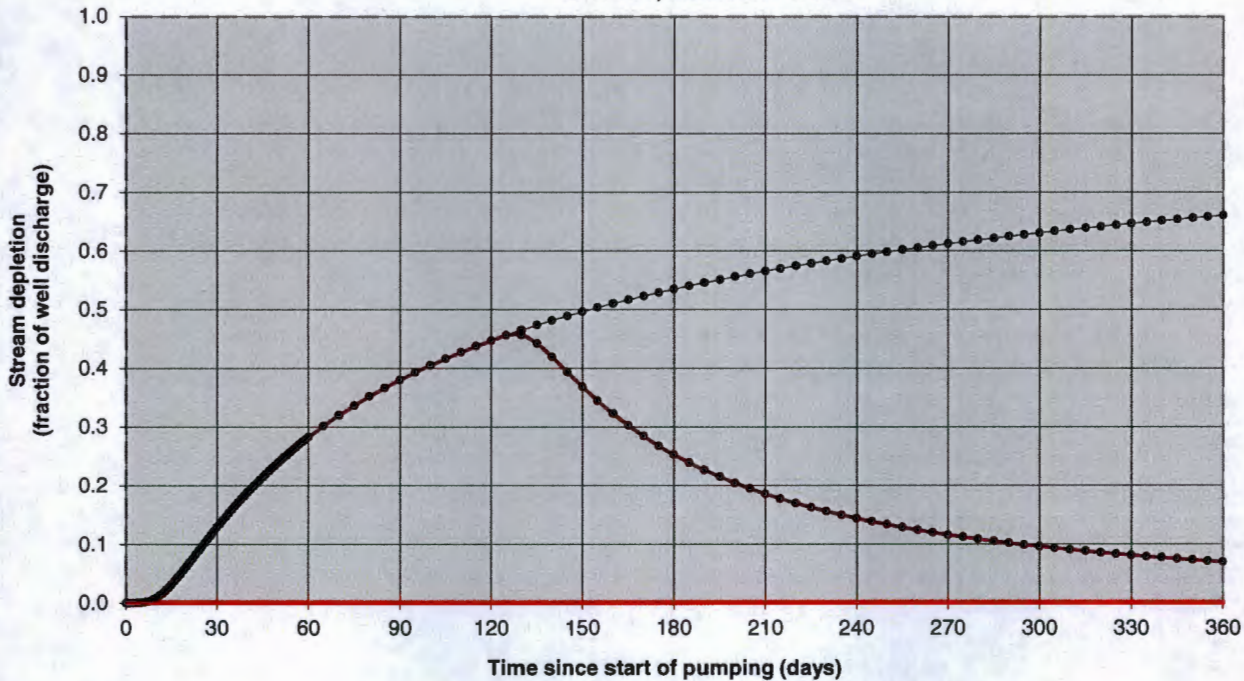
Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 120 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	22.28	22.28	22.28	22.28	22.28	22.28	22.28	22.28	22.28	22.28	22.28	22.28
Jenk SD %	0.275	0.440	0.528	0.585	0.351	0.216	0.151	0.114	0.091	0.074	0.062	0.053
Jen SD cfs	6.120	9.801	11.77	13.03	7.810	4.807	3.374	2.549	2.018	1.652	1.386	1.185
Hunt SD %	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM
Hunt SD cfs	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM	#NUM

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	10000	10000	10000	gpm
Distance to stream	a	5676	5676	5676	ft
Aquifer hydraulic conductivity	K	1000	1500	2000	ft/day
Aquifer thickness	b	60	60	60	ft
Aquifer transmissivity	T	60000	90000	120000	ft*ft/day
Aquifer storage coefficient	S	0.2	0.2	0.2	
Stream width	ws	1000	1000	1000	ft
Streambed hydraulic conductivity	Ks	0.25	100	100	ft/day
Streambed thickness	bs	1	1	1	ft
Streambed conductance	sbc	250	100000	100000	ft/day
Stream depletion factor (Jenkins)	sdf	107.38992	71.59328	53.69496	days
Streambed factor (Hunt)	sbf	23.65	6306.66667	4730	

Transient Stream Depletion (Jenkins, 1970; Hunt, 1999)

G-17738, Madison - Well 7



Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 120 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	22.28 2	22.28 2	22.28 2	22.28 2	22.28 2	22.28 2	22.28 2	22.28 2	22.28 2	22.28 2	22.28 2	22.28 2
Jenk SD %	0.128	0.282	0.380	0.447	0.368	0.252	0.185	0.144	0.116	0.096	0.081	0.070
Jen SD cfs	2.861	6.291	8.468	9.963	8.203	5.625	4.133	3.203	2.579	2.136	1.808	1.556
Hunt SD %	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !
Hunt SD cfs	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !	#NUM !

Parameters:

		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	10000	10000	10000	gpm
Distance to stream	a	7900	7900	7900	ft
Aquifer hydraulic conductivity	K	1000	1500	2000	ft/day
Aquifer thickness	b	60	60	60	ft
Aquifer transmissivity	T	60000	90000	120000	ft*ft/day
Aquifer storage coefficient	S	0.2	0.2	0.2	
Stream width	ws	1000	1000	1000	ft
Streambed hydraulic conductivity	Ks	0.25	100	100	ft/day
Streambed thickness	bs	1	1	1	ft
Streambed conductance	sbc	250	100000	100000	ft/day
Stream depletion factor (Jenkins)	sdf	208.0333333	138.6888889	104.0166667	days
Streambed factor (Hunt)	sbf	32.91666667	8777.777778	6583.333333	