

PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: Water Rights Section Date September 23, 2013

FROM: Ground Water/Hydrology Section Karl Wozniak
Reviewer's Name

SUBJECT: Application G- 17653 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:** Carlton Nursery Company **County:** Yamhill

A1. Applicant(s) seek(s) 1.463 cfs from 2 well(s) in the Willamette Basin,
 _____ subbasin Quad Map: Mission Bottom

A2. Proposed use: Nursery 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	YAMH 55313	1	Older alluvium (confined)	1.463	5S/3W-28 SE-SW	1200' N, 265' E fr NE cor DLC 60
2	Proposed	2	Holocene alluvium (unconfined)	1.463	5S/3W-33 NW-NE	200' N, 1880' E fr NE cor DLC 60
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	165	71	71	09/12/2008	142	0-40	+2-118			140		A
2	95				60	0-18	2-60		20-60			

Use data from application for proposed wells.

A4. **Comments:** Well 1, YAMH 55313, is also listed on transfer T-9812 (permit G-12154) at a maximum rate of 0.03 cfs for supplemental irrigation (20.6 acres) and agriculture uses and on permit G-16699 for a maximum rate of 0.310 cfs for nursery use (20.6 acres).

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 wells are greater than 1/4 mile from the nearest surface water source so the pertinent basin rules (oar 690-502-0240) 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 ground water* 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) 7B, 7C (Well 1 only);
 - 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 _____ 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:** Well 1, YAMH 55313, produces groundwater from a confined aquifer (about 20 feet of productive sands and gravels) in older alluvial sands and gravels that occur beneath about 80 feet of Willamette Silt on the terraces west of the Holocene flood plain of the Willamette River. Proposed Well 2 will be located in the Holocene flood plain and will produce from an unconfined aquifer in Holocene sands and gravels.

Water levels in nearby wells that produce from the confined aquifer show no systematic long-term declines but show some evidence of increased summer drawdowns. Water levels in the unconfined flood-plain aquifer are expected to be stable since the water level in this aquifer is likely to be controlled by river stage of the adjacent reaches of the Willamette River.

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	Older alluvium	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Holocene alluvium	<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"/>

Basis for aquifer confinement evaluation: Water bearing zones in Well 1 are confined by 70 to 80 feet of fine grained sediments which are saturated within 5-15 feet of land surface. Additionally, water levels in nearby wells rise above water-bearing zones. These factors indicate the well produces from a confined aquifer. Proposed Well 2 will be completed in coarse-grained Holocene alluvium; nearby wells and general experience indicates that groundwater is unconfined in these water-bearing zones.

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 R (channel west of Wheatland Bar)	100	90	5800	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1	Willamette R (channel west of Wheatland Bar)	100	90	4100	<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"/>
						<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"/>

Basis for aquifer hydraulic connection evaluation: Published water table maps show flow toward, and discharge into, the Willamette River. Saturated sediments occur between the river and the wells. These factors indicate that the river and the aquifer system are hydraulically connected.

Water Availability Basin the well(s) are located within: 182: WILLAMETTE R > COLUMBIA R – AB MOLALLA R

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"/>	MF182A	1500	<input type="checkbox"/>	3830	<input type="checkbox"/>	<25%	<input type="checkbox"/>
2	1	<input type="checkbox"/>	<input type="checkbox"/>	MF182A	1500	<input type="checkbox"/>	3830	<input type="checkbox"/>	4.9%	<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: Pumping impacts for Well 1 will likely spread quickly in the confined system. However, once the cone of depression reaches the unconfined floodplain, the rate of its spread will drastically diminish. Therefore, impacts to surface water sources in the floodplain are likely to be much less than 25% after 30 days. Impacts for Well 2 can be estimated using the Hunt 1999 model which indicates stream depletion of about 5% of the pumping rate after 30 days (see attached plot and table). This does not account for the likely boundary effect of a change from a confined to an unconfined aquifer system just west of Well 2. The worst case scenario, realized only if there was no hydraulic connection across the boundary, would be a doubling of the impact after 30 days or about 10% of the pumping rate. This is still below the Division 9 threshold of 25% after 30 days.

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													
		%	%	%	%	%	%	%	%	%	%	%	%
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: This section was not evaluated for Well J since even at the full rate of 1.463cfs, stream depletion will never exceed 1% of the natural flow at 80% exceedence in any given month (see water availability tables).

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:** _____

References Used: _____

Gannett, Marshall W., and Caldwell, Rodney R., 1998, Geologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington: U. S. Geological Survey Professional Paper 1424-A, 32p, 8 plates.

Conlon and others, 2005, Ground-water hydrology of the Willamette Basin, Oregon: U.S Geological Survey Scientific Investigations Report 2005-5168.

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

D. WELL CONSTRUCTION, OAR 690-200

D1. Well #: 1 Logid: YAMH 55313

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: _____

_____, 200_____
(Enforcement Section Signature)

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

Water Availability Tables

**WILLAMETTE R > COLUMBIA R - AB MOLALLA R
WILLAMETTE BASIN**

Water Availability as of 10/20/2013

Watershed ID #: 182

Exceedance Level:

Date: 10/20/2013

Time: 2:23 PM

Water Availability Calculation

Monthly Streamflows in Cubic Feet per Second
Storage 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	21,400.00	2,250.00	19,100.00	0.00	1,500.00	17,600.00
FEB	23,200.00	7,440.00	15,800.00	0.00	1,500.00	14,300.00
MAR	22,400.00	7,220.00	15,200.00	0.00	1,500.00	13,700.00
APR	19,900.00	6,870.00	13,000.00	0.00	1,500.00	11,500.00
MAY	16,600.00	4,200.00	12,400.00	0.00	1,500.00	10,900.00
JUN	8,740.00	2,050.00	6,690.00	0.00	1,500.00	5,190.00
JUL	4,980.00	1,870.00	3,110.00	0.00	1,500.00	1,610.00
AUG	3,830.00	1,720.00	2,110.00	0.00	1,500.00	614.00
SEP	3,890.00	1,470.00	2,420.00	0.00	1,500.00	918.00
OCT	4,850.00	717.00	4,130.00	0.00	1,500.00	2,630.00
NOV	10,200.00	851.00	9,350.00	0.00	1,500.00	7,850.00
DEC	19,300.00	924.00	18,400.00	0.00	1,500.00	16,900.00

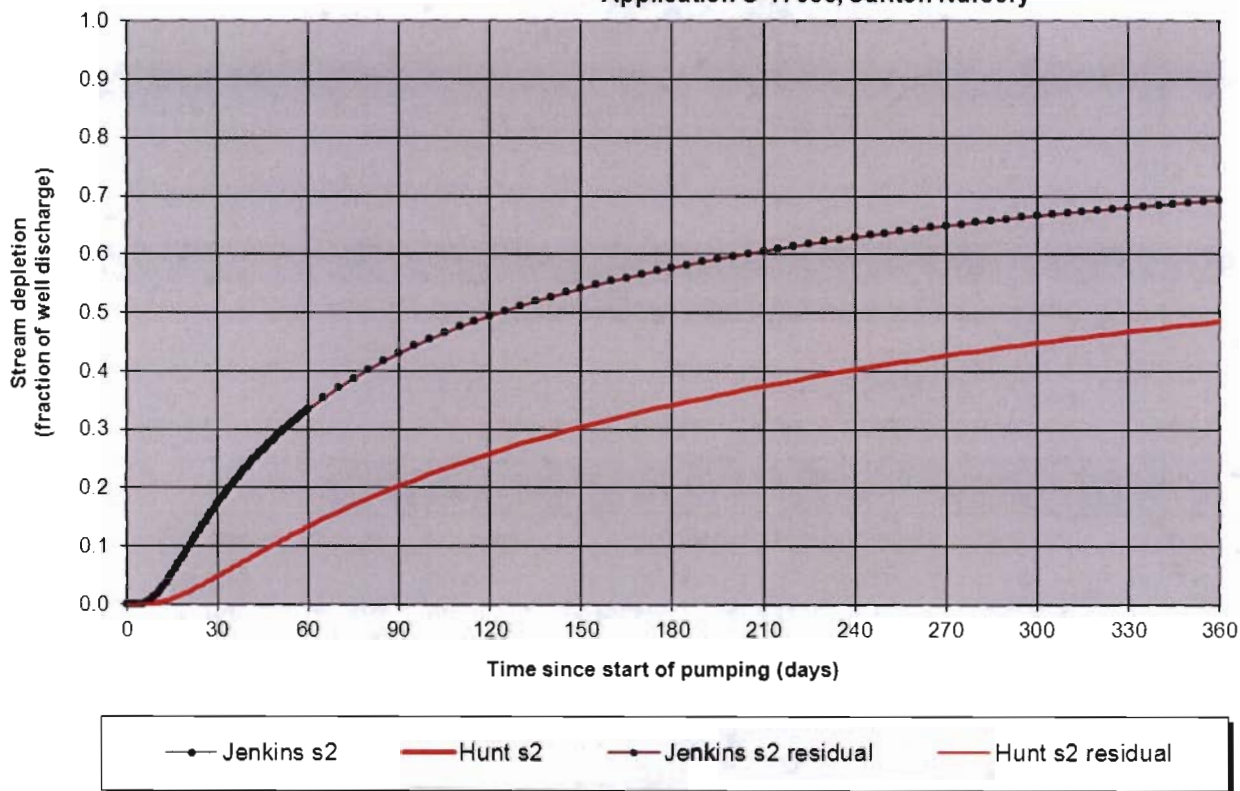
Detailed Report of Instream Flow Requirements

Instream Flow Requirements in Cubic Feet per Second

Application #	Status	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MF182A APPLICATION		1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00	1,500.00

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

Application G-17653, Carlton Nursery



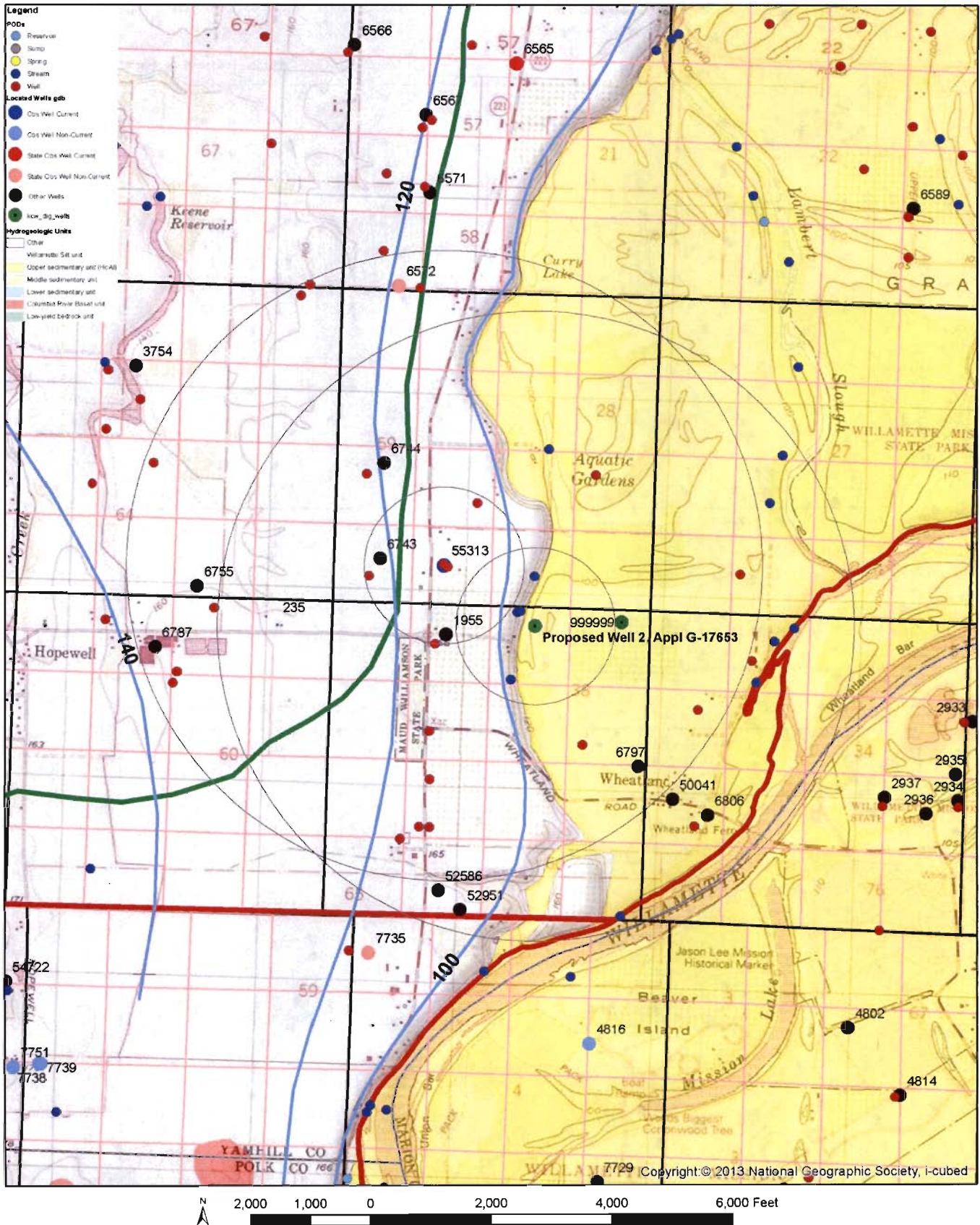
Output for Hunt Stream Depletion, Scenerio 2 (s2): Time pump on = 360 days

Days	30	60	90	120	150	180	210	240	270	300	330	360
Qw, cfs	1.463	1.463	1.463	1.463	1.463	1.463	1.463	1.463	1.463	1.463	1.463	1.463
Jenk SD %	0.172	0.334	0.430	0.494	0.541	0.577	0.605	0.629	0.649	0.666	0.680	0.693
Jen SD cfs	0.251	0.488	0.629	0.723	0.792	0.844	0.886	0.920	0.949	0.974	0.995	1.014
Hunt SD %	0.049	0.134	0.204	0.259	0.305	0.342	0.375	0.402	0.427	0.448	0.468	0.485
Hunt SD cfs	0.071	0.196	0.298	0.379	0.446	0.501	0.548	0.589	0.624	0.656	0.684	0.710

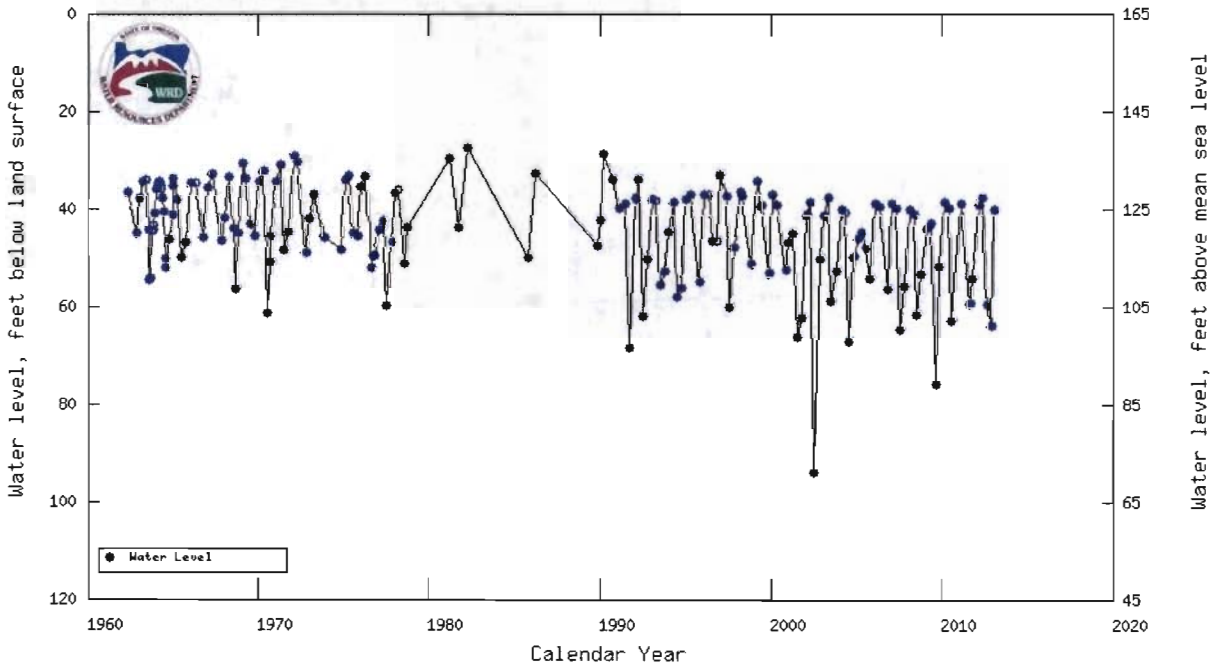
Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate	Qw	1.463	1.463	1.463	cfs
Distance to stream	a	4100	4100	4100	ft
Aquifer hydraulic conductivity	K	1000	1000	1000	ft/day
Aquifer thickness	b	30	30	30	ft
Aquifer transmissivity	T	30000	30000	30000	ft*ft/day
Aquifer storage coefficient	S	0.2	0.2	0.2	
Stream width	ws	50	50	50	ft
Streambed hydraulic conductivity	Ks	1	1	1	ft/day
Streambed thickness	bs	3	3	3	ft
Streambed conductance	sbc	16.66666667	16.66666667	16.66666667	ft/day
Stream depletion factor (Jenkins)	sdf	112.0666667	112.0666667	112.0666667	days
Streambed factor (Hunt)	sbf	2.277777778	2.277777778	2.277777778	

Well Location Map

G-17653, Carlton Nursery



Oregon Water Resources Department (OWRD) Well Location	5.00S/3.00W-21ACB
OWRD Logid	YAMH 6565
OWRD Well Tag (Well ID)	----
OWRD State Observation Well Number	1000
Total well depth (feet below land surface)	234
Land surface elevation (feet above mean sea level)	165
Primary use of well	IRRIGATION
Primary aquifer system	Quaternary-Late Tertiary Sediment Aquifers



Oregon Water Resources Department (OWRD) Well Location	5.00S/3.00W-28cd
OWRD Logid	YAMH 55313
OWRD Well Tag (Well ID)	----
OWRD State Observation Well Number	----
Total well depth (feet below land surface)	142
Land surface elevation (feet above mean sea level)	165
Primary use of well	----
Primary aquifer system	Quaternary-Late Tertiary Sediment Aquifers

