PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: Water Rights Section Date **20 January 2009**

FROM: Ground Water/Hydrology Section **K. Lite**
Reviewer's Name

SUBJECT: Application G- **17067** 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: **Gary Young** County: **Crook**

A1. Applicant(s) seek(s) **(2805 gpm) 6.25** cfs from **2** well(s) in the **Deschutes** Basin, **Upper Crooked River (note: Beaver Creek)** subbasin Quad Map: **Rabbit Valley**

A2. Proposed use: **Irrigation (primary 500 acres)** Seasonality: **01 April – 30 September**

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	**Not drilled**	**Well #1**	**Likely CRB**	**3.125**	**16S/22E-sec 36 ADB**	**1922' S, 710' W fr NE cor S 36**
2	**Not drilled**	**Well #2**	**Likely CRB**	**3.125**	**17S/22E-sec 01 BDB**	**1922' S, 1923' E fr NW cor S 01**

* 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	**3825**	**Prop. 250**	**Prop. 200**	**N.A.**	**Prop. 275 – 350**	**Prop. 0 – 20**	**Prop. 0 – 18 to 40**		**Prop. 40 to 60**			
2	**3870**	**Prop. 250**	**Prop. 200**	**N.A.**	**Prop. 275 – 350**	**Prop. 0 – 20**	**Prop. 0 – 18 to 40**		**Prop. 40 to 60**			

Use data from application for proposed wells.

A4. **Comments: The well sites are located in Rabbit Valley drained by Watson Creek that discharges to the Crooked River. Generally, alluvium, other sediments, ashflow tuff, and tuffaceous sedimentary rocks overly basalt in the area. The basalt is likely Picture Gorge Basalt (CRBG). At nearby wells CROO 53345 and CROO 53636, the reported static ground water level is within the basalt below the overlying tuff and sediments. However, the static water level in CROO 53345 is within elevation error with Lower Watson Spring (between Merwin Reservoir No. 3 and Merwin Reservoir No. 2) that discharges to Watson Creek, and is above the Crooked River.**

A5. ☒ **Provisions of the Deschutes** 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 located outside the USGS Deschutes ground water study area.**

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 AND 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 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:** _____

Condition with 7B and 7N

A large amount of groundwater has been, and is being permitted in a relatively small area of Rabbit Valley. The sustainability of the resource in the area, given the new development, is unknown. The groundwater resource is likely relatively small (in area) within the Paulina Basin. There are no State Observation Wells in the vicinity of the new development.

Alluvium, other sediments, and tuffaceous sedimentary rocks overly basalt in the area. The basalt is likely vertically fractured, and ground water in the basalt may be hydraulically connected to the overlying sediments, when saturated, and subsequently to surface water. At well CROO 52330, the reported static ground water level is within the basalt below the overlying sediments and the nearest surface water. However, the static water level is within elevation error with Lower Watson Spring (between Merwin Reservoir No. 3 and Merwin Reservoir No. 2) that discharges to Watson Creek.

The nearest state observation well found is State Obs Well 96 (CROO 2929, open to alluvium and basalt with 3000 gpm yield), about 23 to 25 miles south of the well sites. It was monitored periodically from 1964 to about 1985. State Observation Well 96 generally fluctuated less than 2-feet and a maximum of about 10-feet during the period of record.

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	**Likely Basalt**	☐	☒
2	**Likely Basalt**	☐	☒
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation:

The groundwater flow system is characterized as generally unconfined with discontinuous low permeability layers causing local (limited, discontinuous) confinement. Widely-spaced (>100 ft) water-bearing zones in basalt at a nearby well (CROO 53636) indicate vertical connectivity between the 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? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**Beaver Creek /Crooked River**	**3825**	**3635**	**13100**	☒	☐	☐	☐	☒
2	**1**	**Beaver Creek /Crooked River**	**3875**	**3635**	**8300**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation:
The hydraulic head in wells near the proposed POA's are above Beaver Creek/Crooked River and the ground-water gradient is likely towards those drainages. The likely aquifer unit for this application (Picture Gorge Basalt) is exposed at the surface in Beaver Creek. It is likely that the basalt unit is hydraulically connected to Beaver Creek/ Crooked River.

Ground water at the proposed wells may also be hydraulically connected to Watson Creek, most likely at Lower Watson Spring.. Reported static water level in the area are within the elevation error with Lower Watson Spring adjacent to Watson Creek.

Water Availability Basin the well(s) are located within: CROOKED R > DESCHUTES R - AB SAND CR

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?
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: _____

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
1	**1**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Well Q as CFS		**0.00**	**0.00**	**0.00**	**3.125**	**3.125**	**3.125**	**3.125**	**3.125**	**3.125**	**3.125**	**0.00**	**0.00**
Interference CFS		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
2	**1**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Well Q as CFS		**0.00**	**0.00**	**0.00**	**3.125**	**3.125**	**3.125**	**3.125**	**3.125**	**3.125**	**3.125**	**0.00**	**0.00**
Interference CFS		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
		%	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Well Q as CFS													
Interference CFS													
		%	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Well Q as CFS													
Interference CFS													
		%	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
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.	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
(B) = 80 % Nat. Q	**78.9**	**175.0**	**337.0**	**598.0**	**404.0**	**261.0**	**80.1**	**38.7**	**45.2**	**47.3**	**60.6**	**76.5**
(C) = 1 % Nat. Q	**0.789**	**1.750**	**3.370**	**5.980**	**4.040**	**2.610**	**0.801**	**0.387**	**0.452**	**0.473**	**0.606**	**0.765**
(D) = (A) > (C)	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
(E) = (A / B) x 100	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

(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:

The proposed wells are likely hydraulically connected, but are more than one mile from the Beaver Creek/ Crooked River. Interference with the river was not calculated, an appropriate model is not available for the analysis.

The reach of Watson Creek likely in hydraulic connection with the proposed wells is also more than one mile from the well site. Interference with the creek was also not calculated due to the lack of an appropriate model.

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:**

If a water right is issued, condition with 7B, 7N, and 7J

The well sites are located in Rabbit Valley drained by Watson Creek that discharges to the Crooked River. Generally, alluvium, other sediments, and tuffaceous sedimentary rocks overly basalt in the area. The basalt is likely fractured, and ground water in the basalt is likely hydraulically connected to the overlying sediments, when saturated, and subsequently to surface water. At well CROO 52330, the reported static ground water level is within the basalt below the overlying sediments and the nearest surface water. However, the static water level is within elevation error with Lower Watson Spring (between Merwin Reservoir No. 3 and Merwin Reservoir No. 2) that discharges to Watson Creek.

Ground water at the wells is likely hydraulically connected to Watson Creek, most likely at Lower Watson Spring rather than the nearest reach. The reported static water level is below the nearest reach, but is within the elevation error with Lower Watson Spring adjacent to Watson Creek. The distance to Watson Creek in the above table is the distance to the creek at Lower Watson Spring. Interference with the creek was not calculated, awaiting site specific aquifer properties and the ability to represent streams associated with springs.

The reported static water level is above Crooked River/Beaver Creek. However, a hydraulic connection could not be determined with available data.

References Used:

Application File: G-17067

Swanson, D.A. 1969. Reconnaisance geologic map of the east half of the Bend quadrangle, Crook, Wheeler, Jefferson, Wasco, and Deschutes Counties, Oregon: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-568.

Gonthier, J.B. 1985. A description of aquifer units in eastern Oregon: U.S. Geological Survey Water Resources Investigations Report 84-4095, 39 p., maps.

Walker, G. W. (editor) 1990. Geology of the Blue Mountains region of Oregon, Idaho, and Washington; Cenozoic geology of the Blue Mountains region: U.S. Geological Survey Professional Paper 1437, 135 p.

Rabbit Valley and Liggett Table quadrangle maps (USGS map, 1:24,000 scale)

State Observation Well: 96 (CROO 2929).

Multiple well reports (well logs) found for: T16S/R22E-sec 13 to 36 and T17S/R22E-sec 1 to 18

OWRD Water Availability Analysis

D. WELL CONSTRUCTION, OAR 690-200

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: _____

_____ _____, 200____.

(Enforcement Section Signature)

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