

Water Right Conditions
Tracking Slip

Groundwater/Hydrology Section

FILE # # G-17494

ROUTED TO: Water Rights

TOWNSHIP/

RANGE-SECTION: 75/3W-7

CONDITIONS ATTACHED?: [] yes [] no

REMARKS OR FURTHER INSTRUCTIONS:

See related file G-17495.

page 2.

Reviewer: Karl Wozniak

PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: Water Rights Section Date December 13, 2011
 FROM: Ground Water/Hydrology Section Karl C. Wozniak
Reviewer's Name
 SUBJECT: Application G- 17494 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: X NOVO LLC County: Polk

- A1. Applicant(s) seek(s) 1 cfs from 1 well(s) in the Willamette Basin,
Brush College Crk / Glenn Creek subbasin Quad Map: Salem West
- A2. Proposed use Primary Irrigation & Storage Seasonality: Irr, Mar 1-Oct 31; Storage, Nov 1 – Feb 28
- 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 | Drain Tiles | POD A | | | 07S-03W-07 NW/NE | 705' S, 290' E fr N1/4 cor S 7 |
| 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 |
|------|------------------|--------------------|------------|----------|-----------------|--------------------|-----------------------|----------------------|------------------------------|------------------|----------------|-----------|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Use data from application for proposed wells.

A4. **Comments:** The POA is described on the application as "...a pipe system collecting groundwater from farm tiles [to be installed] for storage in a reservoir during the approved season". The reservoir will have a capacity of 9 AF. Water from the reservoir will be used for primary irrigation during the irrigation season. However, the applicant also intends to divert water from the drain tile system to the reservoir and then onto the farm field during the irrigation season. In this manner, the applicant proposes to continuously recycle applied irrigation water back to storage for re-application during the irrigation season. Some of this re-cycled water will be water applied from the reservoir, some will be from water applied from a proposed supplemental well on application G-17495, and some will be groundwater drained from the water table. Effectively, then, the drain tile system will be used to divert groundwater for storage during the storage season and for irrigation during the irrigation season. However, no rate is proposed for the amount diverted during the irrigation season.

5. **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: Portions of the drain field are located less than 1/4 mile from Brush College Creek. Drain tiles are designed to drain groundwater from the water table. Since the water table, by definition, is unconfined, the pertinent basin rules (OAR 690-502-0240) are applicable.

6. Well(s) # 1, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.

Name of administrative area: Eola Hills Groundwater Limited Area (OAR 690-502-020)

Comments: The drain tiles will effectively be a well since they will be constructed to capture shallow groundwater. The limited area rules allow the issuance of 5-year permits for _____ly efficient irrigation limited to one acre-foot per acre per year.

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 shall contain condition #(s) Large water use reporting;
 - ii. The permit should be conditioned as indicated in item 2 below.
 - iii. The permit shall 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: The drain tile field that will serve as the POA for this application is underlain by the Grande Ronde Basalt Formation of the Columbia River Basalt Group which is underlain by Tertiary marine sediments. Mapped basalt members in the area include the Winter Water basalt and the underlying Ortley basalt. The total basalt thickness is about 250 feet but probably varies locally as there appears to be considerable erosional relief at the top of the underlying marine sediments. Brush College Creek cuts through the entire basalt section and exposes marine sediments in the creek bed about ¼ mile to the southeast of the proposed POA. Unconfined groundwater occurs near the surface of the basalts but most productive groundwater occurs in tabular confined aquifers that occupy thin rubble zones (interflow zones) at the contacts between lava flows. Productive groundwater in the marine sediments, part of the low-yield bedrock aquifer system, is probably limited to fractures.

The drain tiles will produce water from the water table which probably mimics the geometry of the local topography. This suggests that groundwater flow within the water table aquifer will be directly to the southwest toward Brush College Creek. It is unlikely that other groundwater users will be impacted by the diversion of this water since most basalt groundwater in the area is appropriated from wells that tap deeper confined water-bearing zones that are upgradient from the proposed POA. There is no existing data to indicate the natural capacity of the water table aquifer. Most of the summer production from the drain tiles is likely to be re-captured irrigation water.

Special Condition: All drain tiles that are used as a source of water on this permit shall be tied to a common diversion point which shall be equipped with a suitable measuring device as approved by the Director.

OAR 690-502-0250 requires that all new permits issued to appropriate groundwater from Columbia River Basalt Group aquifers shall be conditioned to measure water levels and water use. Because of the nature of the POA, a water-level measurement condition is not likely to be practical or to provide useful information; therefore, it was not included as a proposed condition.

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 | Columbia River Basalt | <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: The application proposes to produce groundwater captured at the water table by drain tiles installed near land surface at the top of the basalt unit. By definition, the water table is 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? | | | Potential for Subst. Interfer. Assumed? | |
|------|------|---------------------|-------------------|-------------------|------------------|-------------------------------------|--------------------------|-------------------------------------|---|--------------------------|
| | | | | | | YES | NO | ASSUMED | YES | NO |
| 1 | 1 | Brush College Creek | 460 | 250-400 | 1000 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" 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"/> | <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: Drain tiles are designed to discharge groundwater to the surface water system. It was assumed that drain-tile water, if not captured for use, would discharge into Brush Collage Creek which implies a direct hydraulic connection to the creek. The geometry of the basalt aquifer system suggests that Brush College Creek will be the only stream to be impacted by this diversion.

Water Availability Basin the well(s) are located within: 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 checked="" type="checkbox"/> | <input type="checkbox"/> | | | <input type="checkbox"/> | 3830 | <input type="checkbox"/> | 100 | <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"/> |
| | | <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: Since drain tile water would discharge instantaneously to Brush College Creek if no water was diverted from the drain tiles, stream depletion will be 100% of the diversion rate whenever diversions are made from the drain tiles.

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 | | | | | | | | | | | | | |
| (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 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:
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.
Tolan, T., and Beason, M., Unpublished geologic map of the Salem West Quadrangle: Oregon Water Resources Department.
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. 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).**

Water Availability Tables

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

Water Availability as of 11/29/2011

Watershed ID #: 182

Exceedance Level: 80%

Date: 11/29/2011

Time: 9:09 AM

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 | 2,160.00 | 19,200.00 | 0.00 | 1,500.00 | 17,700.00 |
| FEB | 23,200.00 | 7,340.00 | 15,900.00 | 0.00 | 1,500.00 | 14,400.00 |
| MAR | 22,400.00 | 7,120.00 | 15,300.00 | 0.00 | 1,500.00 | 13,800.00 |
| APR | 19,900.00 | 6,780.00 | 13,100.00 | 0.00 | 1,500.00 | 11,600.00 |
| MAY | 16,600.00 | 4,100.00 | 12,500.00 | 0.00 | 1,500.00 | 11,000.00 |
| JUN | 8,740.00 | 1,820.00 | 6,920.00 | 0.00 | 1,500.00 | 5,420.00 |
| JUL | 4,980.00 | 1,640.00 | 3,340.00 | 0.00 | 1,500.00 | 1,840.00 |
| AUG | 3,830.00 | 1,490.00 | 2,340.00 | 0.00 | 1,500.00 | 844.00 |
| SEP | 3,890.00 | 1,240.00 | 2,650.00 | 0.00 | 1,500.00 | 1,150.00 |
| OCT | 4,850.00 | 618.00 | 4,230.00 | 0.00 | 1,500.00 | 2,730.00 |
| NOV | 10,200.00 | 753.00 | 9,450.00 | 0.00 | 1,500.00 | 7,950.00 |
| DEC | 19,300.00 | 830.00 | 18,500.00 | 0.00 | 1,500.00 | 17,000.00 |
| ANN | 15,200,000.00 | 2,150,000.00 | 13,100,000.00 | 0.00 | 1,090,000.00 | 12,000,000.00 |

G-17494, 17495, X NOVO

