

Groundwater Application Review Summary Form

Application # G- 19409

GW Reviewer Gabriela Ferreira Date Review Completed: August 13, 2024

Summary of GW Availability and Injury Review:

☐ Groundwater for the proposed use is either over appropriated, will not likely be available in the amounts requested without injury to prior water rights, OR will not likely be available within the capacity of the groundwater resource per Section B of the attached review form.

Summary of Potential for Substantial Interference Review:

☒ There is the potential for substantial interference per Section C of the attached review form.

Summary of Well Construction Assessment:

☐ The well does not appear to meet current well construction standards per Section D of the attached review form. Route through Well Construction and Compliance Section.

This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations and for conditions that may be necessary for a permit (if one is issued).

WATER RESOURCES DEPARTMENT

MEMO

August 13, 2024

TO: Application G- 19409

FROM: GW: Gabriela Ferreira
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☐ YES The source of appropriation is hydraulically connected to a State Scenic
☒ NO Waterway or its tributaries

☐ YES
☒ NO Use the Scenic Waterway Condition (Condition 7J)

☐ Per ORS 390.835, the Groundwater Section is **able** to calculate ground water interference with surface water that contributes to a Scenic Waterway. The calculated interference is distributed below

☐ Per ORS 390.835, the Groundwater Section is **unable** to calculate ground water interference with surface water that contributes to a scenic waterway; **therefore, the Department is unable to find that there is a preponderance of evidence that the proposed use will measurably reduce the surface water flows necessary to maintain the free-flowing character of a scenic waterway**

DISTRIBUTION OF INTERFERENCE

Calculate the percentage of consumptive use by month and fill in the table below. If interference cannot be calculated, per criteria in 390.835, do not fill in the table but check the "unable" option above, thus informing Water Rights that the Department is unable to make a Preponderance of Evidence finding.

Exercise of this permit is calculated to reduce monthly flows in [Enter] Scenic Waterway by the following amounts expressed as a proportion of the consumptive use by which surface water flow is reduced.

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | | | | | | | | |

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date August 13, 2024
 FROM: Groundwater Section Gabriela Ferreira
 Reviewer's Name
 SUBJECT: Application G- 19409 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 groundwater 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: Cheng Xiong County: Washington

A1. Applicant(s) seek(s) 0.23 cfs from 2 well(s) in the Willamette Basin,
 _____ subbasin

A2. Proposed use Nursery (9.3 acres) Seasonality: Year-round

A3. Well and aquifer data (attach and number logs for existing wells; mark proposed wells as such under logid):

| POA 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 | PROP | 1 | CRB | 0.23 | 1N/4W-9 SW-NW | 0' N, 2605 ft W fr Ctr cor S 9 |
| 2 | PROP | 2 | CRB | 0.23 | 1N/4W-9 SW-NW | 760' N, 2600' W fr Ctr cor S 9 |

* Alluvium, CRB, Bedrock

| POA Well | Well Depth (ft) | Seal Interval (ft) | Casing Intervals (ft) | Liner Intervals (ft) | Perforations Or Screens (ft) | Well Yield (gpm) | Drawdown (ft) | Test Type |
|----------|-----------------|--------------------|-----------------------|----------------------|------------------------------|------------------|---------------|-----------|
| 1 | 300 | 0-220 | 0-220 | N/A | 220-300 | TBD | TBD | TBD |
| 2 | 300 | 0-220 | 0-220 | N/A | 220-300 | TBD | TBD | TBD |

| POA Well | Land Surface Elevation at Well (ft amsl) | Depth of First Water (ft bls) | SWL (ft bls) | SWL Date | Reference Level (ft bls) | Reference Level Date |
|----------|--|-------------------------------|--------------|----------|--------------------------|----------------------|
| 1 | 300 ^b | TBD | TBD | TBD | TBD | TBD |
| 2 | 290 ^b | TBD | TBD | TBD | TBD | TBD |

Use data from application for proposed wells.

A4. **Comments:** The proposed POAs/POU are approximately 4 miles southwest of Banks, Oregon. The applicant proposes nursery use on 9.3 acres by two proposed wells to be drilled (103 gpm / 0.23 cfs, total use of 46.5 af).

^a Land surface elevation from LIDAR at the proposed well location (OLC, 2016).

A5. ☐ **Provisions of the** Willamette 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: The proposed wells are anticipated to utilize a confined aquifer. Per OAR 690-502, the sub-basin rules (OAR 690-502-0050) are not applicable.

A6. ☐ **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.

Name of administrative area: N/A

Comments: N/A

B. GROUNDWATER 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 groundwater 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) 7RLN;
 - 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 Columbia River Basalt groundwater 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 Groundwater 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. **Groundwater availability remarks:** The proposed POA is located within the Columbia River Basalt Group (CRBG/CRB) Miocene-aged flood-lavas, which consist of a series of layered basalt flows ranging in thickness from about 10 to 100 feet. Relatively permeable and productive interflow zones are encountered between layers of basalt flows, separated by low-permeability dense interior that can act as confining units. As such, the CRBG aquifer has relatively low storage capacity (bulk porosity estimated to average 3%) and withdrawal from CRBG aquifers can quickly impact nearby wells. The CRBG is overlain by basin-fill deposits that are estimated to be approximately between 150 to 200 feet in thickness based on nearby well logs, and published data (WASH 6617, WASH 6627, WASH 6628, WASH 79056) (Gannett & Caldwell, 1998; Conlon et al., 2005). The CRBG appears to generally dip to east and uncomfortably overlies marine sedimentary rocks of the Coast Range (Pittsburg Bluff Formation), which form the west-facing slope of the hill, on which the proposed POAs are located. The exact depth to the top of the CRBG is somewhat variable in the area. **If the wells are to develop groundwater from the CRBG, the wells shall be continuously cased and continuously sealed a minimum of five feet into the CRBG beneath the predominantly basin-fill sedimentary unit. The wells may not be completed in such a manner that they allow groundwater to be developed from the overlying basin fill.**

Within approximately one mile of the proposed POA locations, there are at least five water rights, for irrigation or supplemental irrigation, producing from wells completed in the CRBG, with several more exempt use (domestic) wells also likely in the area. Reported maximum yields in the nearby wells typically range up to 40 gpm, with some wells reporting up to 200 gpm. Well deepenings are not prevalent. The requested rate (0.23 cfs, ~100 gpm) is within the higher range of reported yields for water wells in this area.

Five wells near the proposed POA with sufficient water level data and were selected for evaluation: WASH 1273, WASH 6550, WASH 6556, WASH 6617, and WASH 6719. Water level elevations in the five wells range from ~180 feet amsl to 230 feet amsl, in part because of the topographic relief in the area. Water levels observed in WASH 6617 are likely closest to what is expected for the proposed POA's based on construction and proximity. The observation wells demonstrate a similar decline up to 20 feet from the late 1990's through the mid-2000's. Water level record for WASH 6556 and 6719 are available through present and show a general recovery, possibly associated with a regional trend of declining water levels through the 1990's followed by recovery the past ~10-15 years, which may be explained by the expansion of surface water-supplied irrigation districts and changing land use. There is not a preponderance of evidence to support that the water levels in the CRBG groundwater reservoir are declined excessively or excessively declining; therefore, the groundwater reservoir is not over-appropriated.

However, in order to protect senior users and the resource, the conditions listed in Items B1(d)(i) (Condition 7RLN) and B2(c) as well as the following Special Conditions are strongly recommended for any permit issued pursuant to this application.

Special Conditions:

1. Any well constructed or deepened under this or subsequent permits shall be open to a single aquifer of the Columbia River Basalt Group and shall meet the applicable well construction standards (OAR 690-200 and OAR 690-210). In addition, the open interval in each well shall be no greater than 100 feet. An open interval of greater than 100 feet may be allowed if substantial evidence of a single aquifer completion can be demonstrated to the satisfaction of the Department Hydrogeologists, using information from a video log, downhole flowmeter, water chemistry and temperature, or other downhole geophysical methods. These methods shall characterize the nature of the basalt rock and assess whether water is moving in the borehole. Any discernable movement of water within the well bore when the well is not being pumped shall be assumed as evidence of the presence of multiple aquifers in the open interval. If during well construction, it becomes apparent that the well can be constructed to eliminate interference with hydraulically connected streams in a manner other than specified in this permit, the permittee can contact the Department Hydrogeologist for this permit or the Ground Water/Hydrology Section Manager to request approval of such construction. The request shall be in writing and shall include a rough well log and a proposed construction design for approval by the Department. The request can be approved only if it is received and reviewed prior to placement of any permanent casing and sealing material. If the request is made after casing and seal are placed, the requested modification will not be approved. If approved, the new well depth and construction specifications will be incorporated into any certificate issued for this permit.
2. For any well constructed under this or subsequent permits, a dedicated water-level measuring tube shall be installed in each well. The measuring tube shall meet the standards described in OAR 690-215-0060. When requested, access to the wells shall be provided to Department staff in order to make water-level measurements.
3. For any wells constructed or deepened under this or subsequent permits, the applicant shall coordinate with the driller to ensure that drill cuttings are collected at 10 ft intervals and at changes in formation in each well. A split of each sampled interval shall be provided to the Department.
4. If any geologic and hydrogeologic reports are completed for the permittee during the development of permitted wells, including geophysical well logs and borehole video logs, then copies of the reports shall be provided to the Department. Except for borehole video logs, two paper copies, or a single electronic copy, shall be provided of each report. Digital tables of any data shall be provided upon request.

C. GROUNDWATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040**C1. 690-09-040 (1):** Evaluation of aquifer confinement:

| Well | Aquifer or Proposed Aquifer | Confined | Unconfined |
|------|-----------------------------|-------------------------------------|--------------------------|
| 1 | CRB | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2 | CRB | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Basis for aquifer confinement evaluation: Nearby wells completed in CRB report SWLs above the water-bearing zone(s), indicating a confined aquifer or series of aquifers. The CRB aquifers (interflows) are generally confined by dense interflow zones that restrict vertical movement of groundwater. Additionally, the CRB aquifers are overlain by approximately 200 feet of alluvium in the vicinity of the proposed POA.

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 | Unnamed Tributary to Lousignont Canal | 220 – 230 ^a | 265 – 185 ^b | 3,600 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2 | 1 | Unnamed Tributary to Lousignont Canal | 220 – 230 ^a | 265 – 180 ^b | 2,900 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 1 | 2 | Gales Creek | 220 – 230 ^a | 250 – 290 ^b | 3,050 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2 | 2 | Gales Creek | 220 – 230 ^a | 250 – 280 ^b | 2,750 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Basis for aquifer hydraulic connection evaluation: ^a Estimated groundwater elevation is based on reported static water levels in a nearby similarly constructed well (WASH 6617).

^b Stream surface elevation from LIDAR within 1 mile of the proposed POA (OLC, 2016)

Because the estimated groundwater elevations for the POAs are coincident with the estimated elevation ranges for SW 1 and spring rights are present at or near the estimated groundwater elevations, the aquifer system proposed to be accessed by the POA is hydraulically connected to those stream reaches.

Due to the higher elevation of the Gales Creek streambed (~250 to 290 ft amsl), it is not likely hydraulically connected to the proposed POA within one mile.

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

SW 1 – WID #178: W FK DAIRY CR > DAIRY CR – AT MOUTH

SW 2 – WID #101: GALES CR > TUALATIN R – AT MOUTH

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 (SW) source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that SW source, 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"/> | MF178A | 2.00 | <input checked="" type="checkbox"/> | 4.03 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> |
| 2 | 1 | <input type="checkbox"/> | <input type="checkbox"/> | MF178A | 2.00 | <input checked="" type="checkbox"/> | 4.03 | <input checked="" type="checkbox"/> | | <input checked="" 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 # | | Q _w > 5 cfs? | Instream Water Right ID | Instream Water Right Q (cfs) | Q _w > 1% ISWR? | 80% Natural Flow (cfs) | Q _w > 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"/> |

Comments: C3a: The requested instantaneous rate of 0.23 cfs exceeds 1% of the Instream Water Right (0.0200 cfs) and 80% of the natural flow (0.0403 cfs) with the WAB applicable to both POAs, WID # 182. Therefore, both proposed POAs Well 1 and Well 2 trigger a PSI criterion. Reducing the requested rate below 0.0200 cfs would resolve the PSI finding.

Analytical models typically used to estimate stream interference/depletion (Hunt 1999, Hunt 2003) are not appropriate for this particular hydrogeologic setting within a volcanic formation and given the locality's high local topographic relief and correspondingly great variability in surface water and groundwater levels.

C3b: Not applicable.

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 | | | | | | | | | | | | | |
| (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 groundwater 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;

ii. ☐ The permit should contain special condition(s) as indicated in “Remarks” below;

C6. SW / GW Remarks and Conditions: _____

[illegible]

References Used: Application File G-19409

Water well reports and water level data: WASH 1273, WASH 6550, WASH 6556, WASH 6617, WASH 6719

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*, Scientific Investigations Report 2005-5168: U. S. Geological Survey, Reston, VA.

Gannett, M.W. and Caldwell, R., 1998, *Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington*. Professional Paper 1424-A, 32 p: U. S. Geological Survey, Reston, VA.

Oregon Lidar Consortium (OLC), 2016, OLC metro 2014 lidar project, Oregon Department of Geology & Mineral Industries, Portland, OR, November 30.

United States Geological Survey, 2014, National Hydrography Dataset (NHD), 1:24,000, U. S. Department of the Interior, Reston, VA.

Wells, R., Haugerud, R.A., Niem, A.R., Niem, W.A., Ma, L., Evarts, R.C., O'Connor, J.E., Madin, I.P., Sherrod, D.R., Beeson, M.H., Tolan, T.L., Wheeler, K.L., Hanson, W.B., and Sawlan, M.G., 2020, *Geologic map of the greater Portland metropolitan area and surrounding region, Oregon and Washington*: U.S. Geological Survey Scientific Investigations Map 3443, pamphlet 55 p., 2 sheets, scale 1:63,360.

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.

Water Availability Tables

Water Availability Analysis

Detailed Reports

W FK DAIRY CR > DAIRY CR - AT MOUTH

WILLAMETTE BASIN

Watershed ID #: 178 (Map)

Date: 8/8/2024

Water Availability as of 8/8/2024

Exceedance Level: 80%
Time: 8:34 AM

Water Availability Calculation

Water Rights

Consumptive Uses and Storages

Instream Flow Requirements

Watershed Characteristics

Reservations

Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second
Annual Volume 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 | 136.00 | 3.80 | 132.00 | 0.00 | 30.00 | 102.00 |
| FEB | 183.00 | 4.60 | 178.00 | 0.00 | 30.00 | 148.00 |
| MAR | 153.00 | 3.54 | 149.00 | 0.00 | 30.00 | 119.00 |
| APR | 88.90 | 2.99 | 85.90 | 0.00 | 30.00 | 55.90 |
| MAY | 35.90 | 8.52 | 27.40 | 0.00 | 30.00 | -2.62 |
| JUN | 17.20 | 10.40 | 6.78 | 0.00 | 10.00 | -3.22 |
| JUL | 5.34 | 14.40 | -9.08 | 0.00 | 3.00 | -12.10 |
| AUG | 4.03 | 12.40 | -8.36 | 0.00 | 2.00 | -10.40 |
| SEP | 4.21 | 6.69 | -2.48 | 0.00 | 2.00 | -4.48 |
| OCT | 5.68 | 0.88 | 4.80 | 0.00 | 10.00 | -5.20 |
| NOV | 5.26 | 0.92 | 4.34 | 0.00 | 30.00 | -25.70 |
| DEC | 78.60 | 3.82 | 74.80 | 0.00 | 30.00 | 44.80 |
| ANN | 104,000.00 | 4,420.00 | 100,000.00 | 0.00 | 14,300.00 | 87,000.00 |

Water Availability Analysis

Detailed Reports

GALES CR > TUALATIN R - AT MOUTH

WILLAMETTE BASIN

Watershed ID #: 101 (Map)

Date: 8/8/2024

Water Availability as of 8/8/2024

Exceedance Level: 80%
Time: 8:33 AM

Water Availability Calculation

Water Rights

Consumptive Uses and Storages

Instream Flow Requirements

Watershed Characteristics

Reservations

Water Availability Calculation

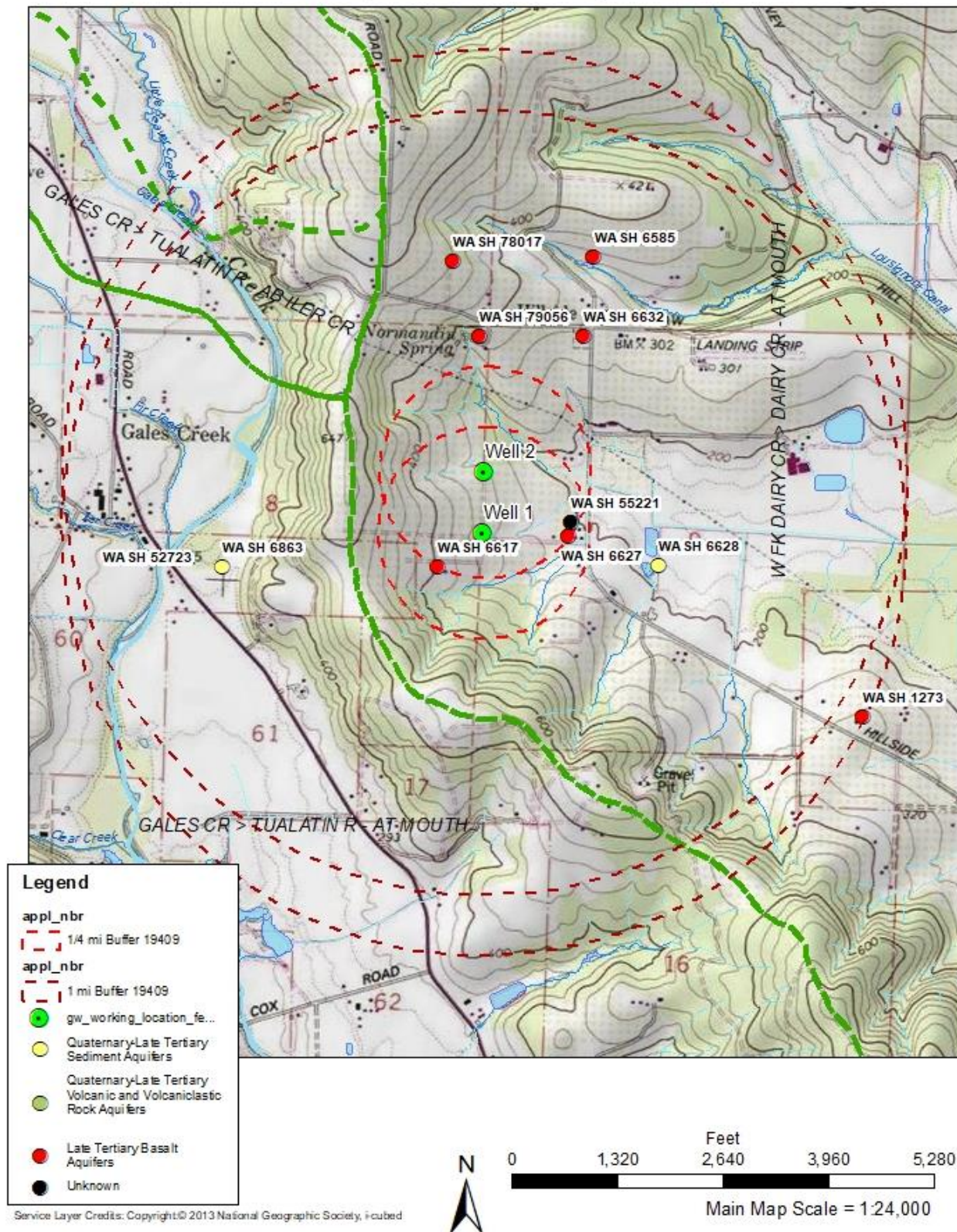
Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

| Month | Natural Stream Flow | Consumptive Uses and Storages | Expected Stream Flow | Reserved Stream Flow | Instream Flow Requirement | Net Water Available |
|-------|---------------------|-------------------------------|----------------------|----------------------|---------------------------|---------------------|
| JAN | 190.00 | 8.75 | 181.00 | 0.00 | 100.00 | 81.20 |
| FEB | 237.00 | 8.89 | 228.00 | 0.00 | 100.00 | 128.00 |
| MAR | 195.00 | 8.51 | 186.00 | 0.00 | 100.00 | 86.50 |
| APR | 120.00 | 8.11 | 112.00 | 0.00 | 100.00 | 11.90 |
| MAY | 66.00 | 13.80 | 52.20 | 0.00 | 100.00 | -47.80 |
| JUN | 36.60 | 15.50 | 21.10 | 0.00 | 35.00 | -13.90 |
| JUL | 20.00 | 18.00 | 1.21 | 0.00 | 35.00 | -33.80 |
| AUG | 14.50 | 17.10 | -2.60 | 0.00 | 12.00 | -14.60 |
| SEP | 10.80 | 12.30 | -1.54 | 0.00 | 12.00 | -13.50 |
| OCT | 14.60 | 7.66 | 6.94 | 0.00 | 12.00 | -5.06 |
| NOV | 41.70 | 7.94 | 33.80 | 0.00 | 100.00 | -66.20 |
| DEC | 152.00 | 8.68 | 143.00 | 0.00 | 100.00 | 43.30 |
| ANN | 123,000.00 | 8,230.00 | 115,000.00 | 0.00 | 48,500.00 | 70,000.00 |

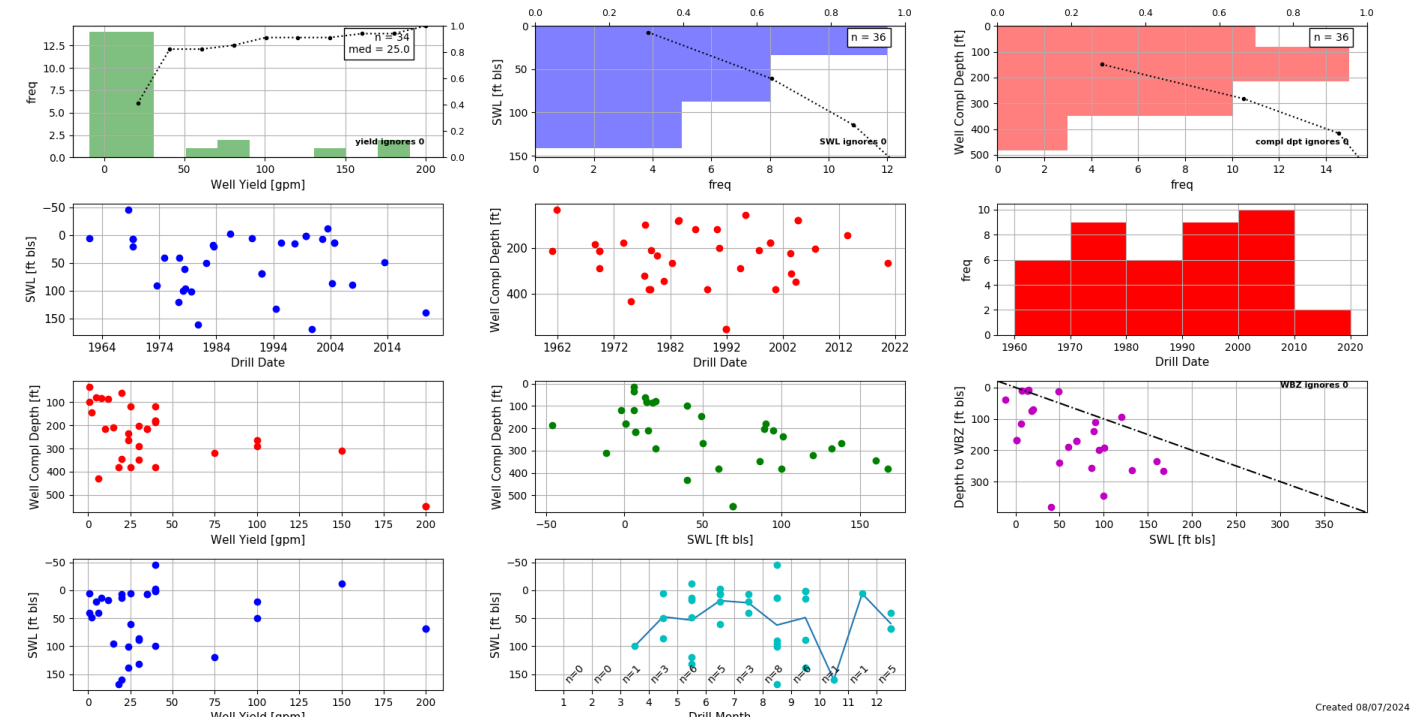
Version: 07/28/2020

Well Location Map

Application G-19409, Xiong Township 1 North 4 West, Section 9



Well Statistics



Water-Level Measurements in Nearby Wells

