WATER RESOURCES DEPARTMENT MEMO 3/16, 2015

TO: **Application G-** 17971

FROM: M. Thoma **- Groundwater Section**

SUBJECT: **Scenic Waterway Interference Evaluation**

_____ YES
_X_ NO — The source of appropriation is within or above a Scenic Waterway

_____ YES
_X_ NO — Use the Scenic Waterway condition (condition 7J)

_____ Per ORS 390.835, the Groundwater Section is able to calculate groundwater interference with surface water that contributes to a Scenic Waterway. The calculated interference distribution is provided below.

_____ Per ORS 390.835, the Groundwater Section is unable to calculate groundwater 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 flows necessary to maintain the free-flowing character of a scenic waterway.

DISTRIBUTION OF INTERFERENCE

Calculate interference as the monthly fraction of the annual consumptive use and fill in the table below. If interference cannot be calculated, per criteria in 390.839, do not fill in the table but check the "unable" option above, thus informing the Water Rights Section that the Department is unable to make a Preponderance of Evidence finding.

Exercise of this permit is calculated to reduce monthly flows in the _____ Scenic Waterway by the following amounts, expressed as a proportion of the annual consumptive use pumped from the well.

Monthly Fraction of Annual Consumptive Use

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

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 3/16/2015

FROM: Groundwater Section Michael J Thoma
Reviewer's Name

SUBJECT: Application G- 17971 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: R. B. Webber Devel. LLC County: Linn

A1. Applicant(s) seek(s) 2.0 cfs from 4 well(s) in the Willamette Basin, Truax Creek subbasin Quad Map: Albany, Crabtree

A2. Proposed use Irrigation Seasonality: April 1 – October 1 (184 d)

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	PROP	1	Alluvium	2.0	11S/03W-02 SESE	5250'S, 5540' W of NE cor S 01†
2	PROP	2	Alluvium	2.0	11S/03W-02 NESE	3280'S, 5650' W of NE cor S 01†
3	PROP	3	Alluvium	2.0	11S/03W-01 NESW	3960'S, 3030' W of NE cor S 01†
4	PROP	4	Alluvium	2.0	11S/03W-01 SESW	5280'S, 2950' W of NE cor S 01†
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	240		5-20‡		100	0-25	0-100		40-80			
2	240		5-20‡		100	0-25	0-100		40-80			
3	240		5-20‡		**100***	0-25	0-100		40-80			
4	240		5-20‡		**100***	0-25	0-100		40-80			

Use data from application for proposed wells.

A4. **Comments:**
†The application gives metes and bounds from the corner of Donation Land Claim 41. Metes and bounds listed in A3 have been converted to be from the same PLS corner for convenience
‡Applicant's wells are proposed. SWL range listed is based on nearby well logs
*The applicant does not list "Well Depth" for wells 3 and 4 on the application but 100 ft is assumed based on casing interval listed and similarities to wells 1 and 2.

A5. ☐ **Provisions of the** Willamette (OAR 690-502-0240) 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 not within ¼ mi of surface water features so provisions of OAR 690-502 do not apply.

A6. ☐ **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: _____
Comments: _____

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) **7N (annual measurement); "Large" water use reporting** ;
   ii. ☐ The permit should be conditioned as indicated in item 2 below.
   iii. ☒ The permit should contain special condition(s) as indicated in item B3 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 ~~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:**

Special Condition: During any pump test required by this permit, observation water-level measurements shall be made in at least one nearby well that is completed in the same aquifer as the pumped well. The observation well should be idle prior to and during the test and should be no greater than 3000 ft from the pumped well. Measurements shall be made at the same times as in the pumped well, shall be accurate to at least 0.1 foot, and shall be recorded on the Department's Pump Test Data Sheets. The pump test report shall include a summary description of the test, water-level readings for each well, well logs for each well, and a map at a scale of 1:24000 or larger showing the well locations to an accuracy of at least 50 feet. The Department requires such a test because there are concerns of potential interference with shallow wells, especially to the north of the proposed POAs where the productive coarse-grained sediments pinch out against Knox Butte and there is limited groundwater data available in the area.

The applicant's proposed POAs are on the northern edge of a thick sequence of coarse-grained, buried alluvial deposits referred to as the Albany Fan. These deposits range from as much as 140 ft thick to the south of the proposed POU to 0 ft to the north where the deposits thin and abut Knox Butte. Near the proposed POAs the deposits are likely between 40 and 80 ft thick and overlain by ~20 ft of fine-grained soil and sediment (Gannett and Caldwell, 1998). The proposed completion depth should produce from these coarse-grained alluvial sediments. Driller's logs from nearby wells show yields in these sediments range from < 10 gpm up to 100 gpm. Given that, the proposed rate of 2.0 cfs (900 gpm) is unlikely from a single well and may not even be obtained from a combination of all 4 wells proposed wells.

The closest well to the proposed POAs with reported water levels (LINN 7478; 151 ft total depth) is ~2.5 mi to south and shows stable water levels over the past several decades. There are no closer wells with reported water levels, but wells that do exist in the area are shallow (often < 100 ft total depth) and produce from the same coarse-grained alluvial fan deposits as the proposed POAs. Therefore there is some concern over interference with nearby domestic wells and so standard interference conditions should be applied to this permit should it be issued and strictly enforced if needed.

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	**Alluvial material of the Albany Fan (Willamette Aquifer)**	☐	☒
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: SWL and First Water reported on driller's logs in nearby wells are similar. Well logs often report < 20 ft of fine-grained material above productive 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**	**Mill Cr.**	**~225**	**240-250**	**13280**	☒	☐	☐	☐	☒
1	**2**	**Willamette R.**	**~225**	**180**	**16180**	☒	☐	☐	☐	☒
2	**1**	**Mill Cr.**	**~225**	**240-250**	**13280**	☒	☐	☐	☐	☒
2	**2**	**Willamette R.**	**~225**	**180**	**15470**	☒	☐	☐	☐	☒
3	**1**	**Mill Cr.**	**~225**	**240-250**	**10650**	☒	☐	☐	☐	☒
3	**2**	**Willamette R.**	**~225**	**180**	**18150**	☒	☐	☐	☐	☒
4	**1**	**Mill Cr.**	**~225**	**240-250**	**10750**	☒	☐	☐	☐	☒
4	**2**	**Willamette R.**	**~225**	**180**	**18530**	☒	☐	☐	☐	☒

Basis for aquifer hydraulic connection evaluation: All proposed POAs (wells 1 thru 4) are > 2 mi from the nearest perennial surface water features (Mill Creek, tributary to S. Santiam R.; and Willamette R.). There is likely hydraulic connection between the proposed aquifer and both Mill Cr. and the Willamette River – which is the regional discharge point – but the distances to these features, the unconfined nature of the aquifer, and the flows in the Willamette R. and S. Santiam R. WABs are such that interference will not likely be significant over the course of an irrigation season (see Section C4a).

Water Availability Basin the well(s) are located within: *Willamette R > Columbia R – AB Mill Cr at Gage 14191000* (ID# 183) **with additional potential impact to** *S. Santiam R > Santiam R – At Mouth* (ID# 30200601)

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

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

Comments: The proposed POAs are not within 1 mi of any perennial streams.

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													
		%	%	%	%	%	%	%	%	%	%	%	%
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: Impacts to Mill Cr. and the Willamette River were not evaluated in detail because the Water Availability Basins for both surface water features show that minimum monthly 80% natural flows are > 100 times the full pumping rate requested (i.e., high enough that the full pumping rate is < 1% of minimum flows; see Water Availability Tables below). Therefore interference will not exceed 1% and there is no potential for substantial interference.

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;

C6. **SW / GW Remarks and Conditions:**

Regional groundwater flow is from SE to NW across the valley where the proposed POAs are located (Conlon et al., 2005). The ultimate discharge location is likely the Willamette River or possibly smaller, intermittent or ephemeral streams draining the relatively flat valley flow. These smaller streams are not considered for SW-GW interference under Division 9 rules. Hydraulic connection is to Mill Cr. (tributary to S. Santiam R.) and the Willamette R. but flows in each WAB are >100 times the requested rate of 2.0 cfs so PSI will not be triggered under any circumstances.

References Used:

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

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

Woodward, Dennis J., Gannett, Marshall W., and Vaccaro, John J., 1998, Hydrogeologic Framework of the Willamette Lowland Aquifer System, Oregon and Washington: U. S. Geological Survey Professional Paper 1424-B, 82p, 1 plate

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
Willamette R.

Water Availability Analysis
Detailed Reports

WILLAMETTE R > COLUMBIA R - AB MILL CR AT GAGE 14191000
WILLAMETTE BASIN

Water Availability as of 3/14/2015

Watershed ID #: 183 (Map) Exceedance Level: 80%
Date: 3/14/2015 Time: 12:04 PM

Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations | Water Rights | Watershed Characteristics

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	18,400.00	2,240.00	16,200.00	0.00	1,300.00	14,900.00
FEB	20,100.00	7,420.00	12,700.00	0.00	1,300.00	11,400.00
MAR	19,600.00	7,210.00	12,400.00	0.00	1,300.00	11,100.00
APR	18,000.00	6,870.00	11,100.00	0.00	1,300.00	9,830.00
MAY	15,500.00	4,170.00	11,300.00	0.00	1,300.00	10,000.00
JUN	8,310.00	1,690.00	6,620.00	0.00	1,300.00	5,320.00
JUL	4,710.00	1,450.00	3,260.00	0.00	1,300.00	1,960.00
AUG	3,620.00	1,330.00	2,290.00	0.00	1,300.00	987.00
SEP	3,680.00	1,160.00	2,520.00	0.00	1,300.00	1,220.00
OCT	4,650.00	747.00	3,900.00	0.00	1,300.00	2,600.00
NOV	9,400.00	853.00	8,550.00	0.00	1,300.00	7,250.00
DEC	16,700.00	910.00	15,800.00	0.00	1,300.00	14,500.00
ANN	13,500,000.00	2,160,000.00	11,300,000.00	0.00	942,000.00	10,400,000.00

S. Santiam R.

Water Availability Analysis
Detailed Reports

S SANTIAM R > SANTIAM R - AT MOUTH
WILLAMETTE BASIN

Water Availability as of 3/16/2015

Watershed ID #: 30200601 (Map) Exceedance Level: 80%
Date: 3/16/2015 Time: 1:18 PM

Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations
Water Rights | Watershed Characteristics

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	3,090.00	266.00	2,820.00	0.00	0.00	2,820.00
FEB	3,360.00	1,530.00	1,830.00	0.00	0.00	1,830.00
MAR	3,170.00	1,260.00	1,910.00	0.00	0.00	1,910.00
APR	2,950.00	1,050.00	1,900.00	0.00	0.00	1,900.00
MAY	2,050.00	713.00	1,340.00	0.00	0.00	1,340.00
JUN	968.00	184.00	784.00	0.00	0.00	784.00
JUL	450.00	206.00	244.00	0.00	0.00	244.00
AUG	275.00	191.00	84.00	0.00	0.00	84.00
SEP	253.00	161.00	92.20	0.00	0.00	92.20
OCT	363.00	139.00	224.00	0.00	0.00	224.00
NOV	1,450.00	140.00	1,310.00	0.00	0.00	1,310.00
DEC	3,040.00	142.00	2,900.00	0.00	0.00	2,900.00
ANN	2,330,000.00	356,000.00	1,980,000.00	0.00	0.00	1,980,000.00

Figure 1: Application review overview map

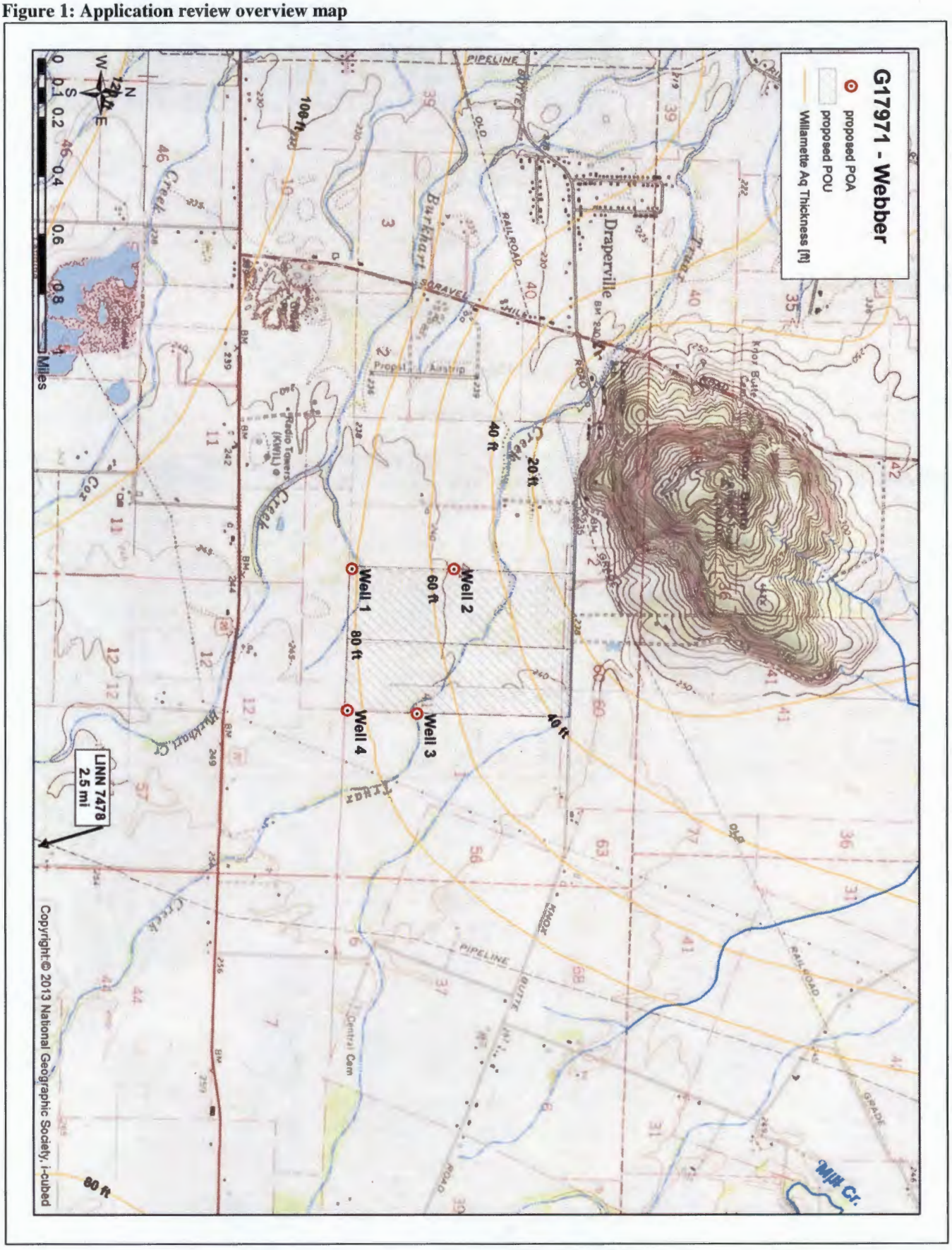

Figure 2: LINN 7478 hydrograph