Groundwater Review Summary Form

Application # G- 18371

GW Reviewer Aurora Boucher **Date Review Completed:** 1/30/2017

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 1/30/,2017

TO: **Application** G-18371

FROM: **GW:** Aurora Bouchier
(Reviewer's Name)

SUBJECT: Scenic Waterway Interference Evaluation

☒ YES
The source of appropriation is within or above a Scenic Waterway
☐ NO

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

☐ 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 _____ 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 January 30, 2017

FROM: Groundwater Section Aurora C Bouchier
Reviewer's Name

SUBJECT: Application G- 18371 Supersedes review of na
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: **The Sterling Trust** County: **Wasco**

A1. Applicant(s) seek(s) 0.99 (0.04 cfs nursery and 0.95 cfs irrigation use) cfs from 1 well(s) in the Deschutes Basin, Lower Deschutes subbasin (Wapinitia quad)

A2. Proposed use Nursery and Irrigation (76.1 acers) Seasonality: year round (nursery), and 3/1 – 10/31 (irrigation)

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	WASC 52430*	Well	Lava flows and volcaniclastic sediment	0.99	5S/12E-29 SW-NE	800' N, 1490' W fr E1/4 cor S 29
2						
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	2136	552	549	9/13/2016	740	0-150	+1.5-150	121-170	610-710	20		Air

Use data from application for proposed wells.

A4. **Comments:** *The well was proposed when the application was submitted. The construction of WASC 52430 was completed before a groundwater review was conducted, and lists an estimated yield of 20 gpm (using an air test). The applicant is requesting 0.99 cfs (444 gpm). In the OWRD Well Log database for Township 5S, Range 12E there are 18 wells completed into similar formations which list driller's estimates of yield, with values ranging from 4.0 to 30 gpm. It is doubtful that the well will be able to produce at the requested rate of 444 gpm. The rate requested for year round nursery use (0.04 cfs or ~ 18 gpm) is likely within the production range of the well.

A5. ☒ **Provisions of the** Deschutes 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 well is outside of the USGS Groundwater Study Area, therefore it is not subject to Division 690-505-0500 to -0620.

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) **7J, 7N, Large Water Use monitoring and reporting with a flowmeter**;
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 _____ 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 nearest State Observation Wells (WASC 3630) is located approximately 11.5 miles to the northeast and is completed into alluvial sands and gravels along the White River. The applicant's well is producing from water-bearing layers of lava and volcaniclastic sediments of the Deschutes Formation (or Deschutes Formation age equivalent, depending on reference). Locally, there are no wells with a history of groundwater level observations which are completed into the same formation. However, within Township 5S/Range 12E there are a number of wells which are likewise completed into the Deschutes Fm/age equivalent. An examination of the static water level measurements listed on the well logs indicates that the water level has remained relatively stable with no apparent decline. Three of the wells (WASC 3707, WASC 3710 and WASC 3718) have been deepened, resulting in a higher water level after the deepening (see hydrograph below). The lack of observation data in the area speaks to the need for condition 7N, annual water level measurements.

The well log provides a driller's estimate of yield on 18 of the wells completed into the same formation, including the applicant's well. The estimated yields range from 4 to 30 gpm. It is doubtful the applicant will be capable of producing the requested rate of 444 gpm from the proposed well (DESC 52430).

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	**Deschutes Fm (or age equivalent similar sequence)**	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The static water level is above the level that water was first encountered in the well.

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**	**White River**	**~1590**	**~1690**	**13,780**	☐	☒	☐	☐	☐
1	**2**	**Wapinitia Creek***	**~1590**	**~2040**	**17,240**	☐	☒	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Groundwater levels are below Wapinitia Creek and below the White River at two miles. The aquifer is not hydraulically connected within a two-mile radius of the well.
*The distance and elevation where Wapinitia Creek is mapped as perennial.

Water Availability Basin the well(s) are located within: 70087: DESCHUTES R> COLUMBIA R- AB MOUTH AT GAGE 14103000

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: This section does not apply.

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: The requested rate (0.99 cfs) is much, much less than 4,320 cfs (the 80% exceedance level of the natural stream flow for the Deschutes River during the month of August). In addition, the nature of the aquifer unit precludes the use of available analytical models to evaluate the timing of interference. Therefore this section was not evaluated.

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:**

The groundwater recharge for Juniper Flats likely originates in the uplands area along the east flank of the Cascade Mountains. The groundwater flow direction across Juniper Flats is generally from west to east and towards the Deschutes River canyon between Maupin and Oak Springs, based on water level data from well logs. Numerous springs exist along the northeast rim of Juniper Flatts between Maupin and Oak Springs, some of which appear to originate at or above the contact of the lavas and volcaniclastic sedimentary layers with the underlying Columbia River Basalt Group.

References Used: Application files for G-18371, as well as nearby G-11011 and G13578, as well as not as nearby G-16211, G-16484, G-17252, and G-18152.

Beebee, Robin A., O'Connor, Jim E., and Grant, Gordon E., 2002; Geology and Geomorphology of the Lower Deschutes River Canyon, Oregon; Oregon Department of Geology and Mineral Industries Special Paper 36, 2002.

Lite, Kenneth E. Jr., Gannett, Marshall W., 2002; Geologic Framework of the Regional Ground-Water Flow System in the Upper Deschutes Basin, Oregon; U.S. Geological Survey Water-Resources Investigations Report 02-4015.

OWRD well log and water level database.

Sherrod, D.R., and Scott, W.E., 1995. Preliminary Geologic Map of the Mount Hood 30- by 60-Minute Quadrangle, Cascade Range, North-Central Oregon: US Geological Survey Open-File Report 95-219.

Smith, Gary, 1998; Geology along U.S. Highways 197 and 97 between The Dalles and Sunriver, Oregon; Oregon Geology Volume 60, Number 1.

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** 1 **Logid:** WASC 52430

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

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION

DESCHUTES R > COLUMBIA R - AB MOUTH AT GAGE 14103000

Watershed ID #: 70087 Basin: DESCHUTES Exceedance Level: 80
Time: 12:22 PM Date: 01/27/2017

Month	Natural Stream Flow	Consumptive Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Requirements	Net Water Available
	Monthly values are in cfs. Storage is the annual amount at 50% exceedance in ac-ft.					
JAN	4,970.00	670.00	4,300.00	450.00	4,500.00	-650.00
FEB	5,530.00	747.00	4,780.00	450.00	4,500.00	-167.00
MAR	6,140.00	1,020.00	5,120.00	450.00	4,500.00	166.00
APR	6,470.00	1,000.00	5,470.00	450.00	4,000.00	1,020.00
MAY	6,220.00	1,150.00	5,070.00	450.00	4,000.00	617.00
JUN	5,560.00	1,220.00	4,340.00	450.00	4,000.00	-106.00
JUL	4,610.00	957.00	3,650.00	450.00	4,000.00	-797.00
AUG	4,320.00	862.00	3,460.00	450.00	3,500.00	-492.00
SEP	4,410.00	747.00	3,660.00	450.00	3,800.00	-587.00
OCT	4,520.00	793.00	3,730.00	450.00	3,800.00	-523.00
NOV	4,610.00	845.00	3,760.00	450.00	3,800.00	-485.00
DEC	4,820.00	771.00	4,050.00	450.00	4,500.00	-901.00
ANN	4,390,000	652,000	3,730,000	326,000	2,950,000	507,000

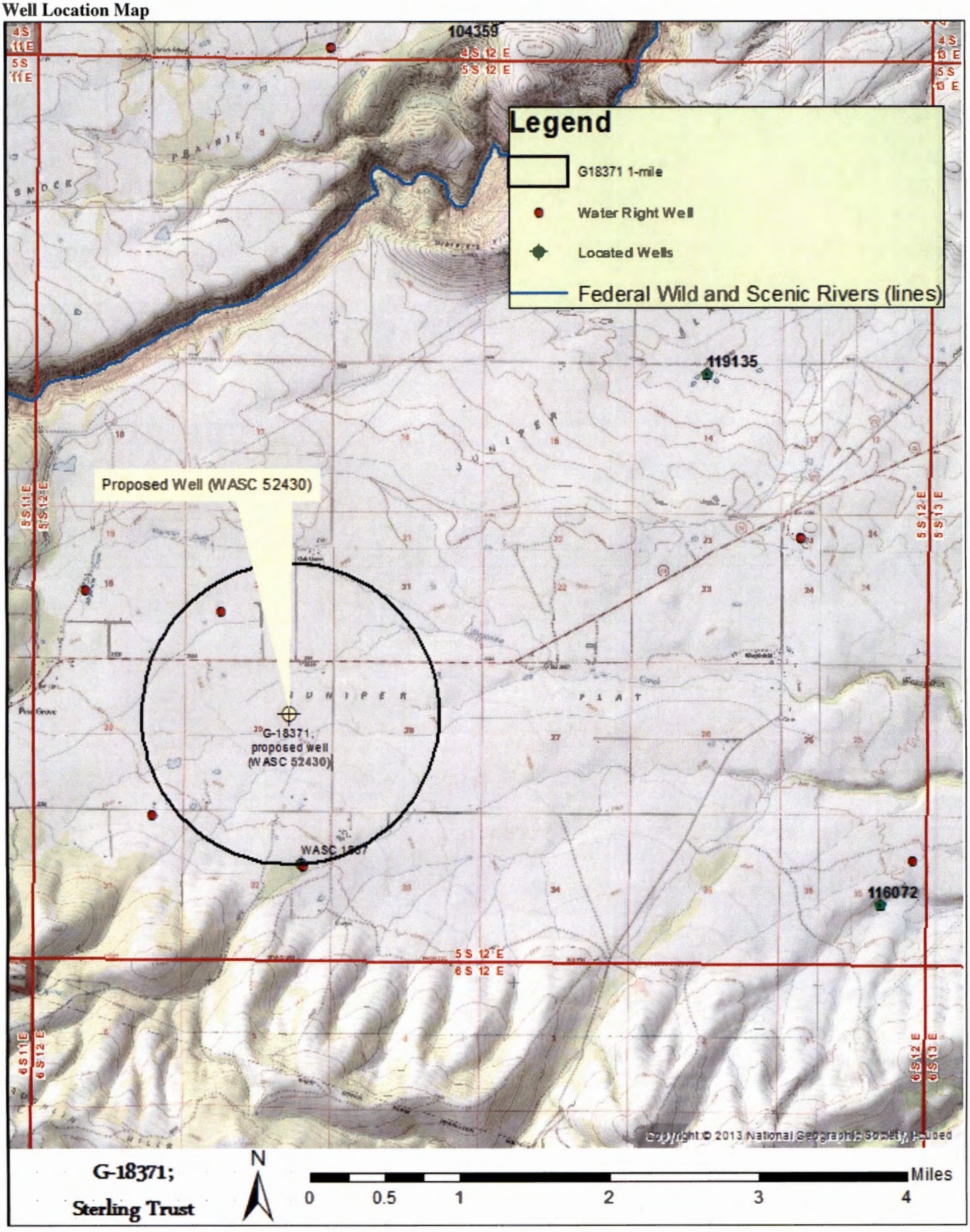
DETAILED REPORT OF INSTREAM REQUIREMENTS

DESCHUTES R > COLUMBIA R - AB MOUTH AT GAGE 14103000

Watershed ID #: 70087 Basin: DESCHUTES
Time: 12:23 PM Date: 01/27/2017

Application Number	Status	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		Monthly values are in cfs.											
TY70501A	TREATY	3000.0	3000.0	3500.0	3500.0	3500.0	3500.0	3000.0	3000.0	3000.0	3000.0	3000.00	3000.0
SY90506A	SWW	4500.0	4500.0	4500.0	4000.0	4000.0	4000.0	4000.0	3500.0	3800.0	3800.0	3800.00	4500.0
IS70087A	CERTIFICATE	3000.0	3000.0	3500.0	3500.0	3500.0	3500.0	3000.0	3000.0	3000.0	3000.0	3000.00	3000.0
IS71194A	CERTIFICATE	4500.0	4500.0	4500.0	4000.0	4000.0	4000.0	4000.0	3500.0	3800.0	3800.0	3800.00	4500.0
MAXIMUM		4500.0	4500.0	4500.0	4000.0	4000.0	4000.0	4000.0	3500.0	3800.0	3800.0	3800.0	4500.0

Well Location Map



Water-Level Trends in Nearby Wells