PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date **May 5, 2016**

FROM: Groundwater Section **Michael J. Thoma**
Reviewer's Name

SUBJECT: Application G- **18243** 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: **Matt Dolinar** County: **Jackson**

A1. Applicant(s) seek(s) **0.15** cfs from **2** well(s) in the **Klamath** Basin, **Cottonwood Cr.** subbasin

A2. Proposed use **Nursery (79.8 ac)** Seasonality: **year-round**

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	JACK 58507	1	Bedrock	0.11	40S/02E-29 NENW	1025'S, 2436'E of NW cor S29
2	JACK 54643	2	Bedrock	0.04	40S/02E-29 NWSW	3664'S, 615'E of NW cor S29

* 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	4530	480	452	6/23/2007	600	0-38	+2-38	5-600	560-580	50		
2	3840	90	30	6/19/2001	150	0-59	+1-59	3-147	87-137	18		

Use data from application for proposed wells.

A4. **Comments:** This application was preceded by an application (G18162) that was for a lower rate and was withdrawn. This application differs from G18162 in requesting a higher rate and that Well #2 was added as a proposed POA.

A5. ☐ **Provisions of the** _____ 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: _____

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 **FROM WELL #1**:

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) **"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 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:** There are very few existing wells near the proposed POA and the nearest current OWRD observation well is > 6 miles from the POA. There are several spring rights to the NE of Well #1 in the Carter Cr. basin and a few in the Cottonwood Cr Basin but given the small rate proposed and distance and vertical relief to these springs, it is unlikely that the proposed use will significantly injure existing rights.

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 **FROM WELL #2**:

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) **"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 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:** Well #2 is located < 200 ft from a permitted spring right (Cert 67352) which is diverted off the property to a neighboring lot. **Pumping from Well #2 will have the potential to cause interference with flows from the spring which would cause a senior user to not get their entitled water from the spring. Therefore, use of Well #2 should not be allowed.**

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	**Bedrock – Early Western Cascades**	☐	☒
2	**Bedrock – Early Western Cascades**	☒	☐

Basis for aquifer confinement evaluation: The well log for Well #1 reports SWL at approximately the same elevation as the water-bearing zone. The location of the well at the basin divide and the deep SWL suggest that the well is located at the top of the recharge zone where hydrostatic pressure is equal to atmospheric pressure at the water table.

The well log for Well #2 reports SWL 60 ft above 'first water', indicating confined conditions

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**	**E. Fk Cottonwood Cr**	**4080**	**< 3300[A]**	**> 1 mile[B]**	☒	☐	☐	☐	☐
1	**2**	**Carter Cr.**	**4080**	**< 3000[A]**	**> 1 mile[B]**	☒	☐	☐	☐	☐
2	**1**	**E Fk Cottonwood Cr**	**3750**	**< 3300[A]**	**~7580[C]**	☒	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation:
[A]Estimated elevation where streams become perennial.

[B]Well #1 sits on the divide between the Cottonwood Cr. Basin (tributary to Klamath River) and the Carter Cr. Basin (tributary to Rogue). Since it is situated along the recharge zone for both basins, it is likely hydraulically connected to both. However, neither of the creeks are perennial or are likely receiving significant groundwater contribution within 1 mile of the proposed POA (USGS Topographic maps for the area are preliminary and do not distinguish between perennial and intermittent/ephemeral streams). The geology and terrain make it difficult to determine impacts to either stream beyond 1 mile. Therefore, despite the proposed POA being hydraulically connected, no streams were evaluated for PSI.

[C]Well #2 is downslope to the west of the divide (Klamath Basin) and will be hydraulically connected to Cottonwood Cr. The distance reported here is measured to where Cottonwood Cr appears to be perennial and receiving considerable groundwater contribution and thus would be hydraulically connected, and is beyond 1 mile of Well #2. Impacts to Cottonwood Cr where not estimated for the same reasons as for Well #1

Water Availability Basin the well(s) are located within: Emigrant Cr > Bear Cr – At Mouth (ID# 70988) **and** E Fk Cottonwood Cr > Cottonwood Cr – At State Line (ID# 31420613)

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: There are no surface water sources hydraulically connected to either well within 1 mile.

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		see comments in C2											
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.													
(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;

C6. **SW / GW Remarks and Conditions:** Well #1 is on the divide between two watersheds that feed into separate river basins (Klamath and Rogue) and Well #2 is located within only the Cottonwood Cr basin. There are no perennial surface water sources within 1 mile of either of the proposed POAs and it is difficult to determine at what distance the streams become perennial and connected to the local groundwater flow, but it is likely beyond 1 mile of either well. The high-relief terrain and regional geology (with ubiquitous faulting, formation contacts, and dipping layers) make using an analytical model to estimate stream impacts (e.g., Hunt 1999) impractical because several model assumptions are not met.

There is an unnamed spring located within the tributary channel to Cottonwood Cr that is within 200 ft of Well #2. This spring is listed as a POD on Cert. 67352 and the POD is described on the application as a 6 ft diameter and 6 ft deep spring box that collects the water (there is also a surface water POD which is described in the application as seasonal and being at "exactly the same location" as the spring POD). Although this spring is a surface water right, according to conversations with both the land owner on whose property the spring is on and the District 13 Watermaster who visited the site, the spring would not flow off the property under natural conditions. Therefore it is not contributing to surface water flows within the WAB or providing water to downstream surface water users and so was not considered in Section C (aka "Division 9 Review")

References Used:

Hunt, B. 1999. *Unsteady Stream Depletion from Ground Water Pumping*. Journal of Hydrologic Engineering, Vol 8(1), pp 12-19

Wiley, T. J., J. D. McClaughry, and J. A. D'Allura. 2011. *Geologic Database of Generalized Geologic Map of Bear Creek Valley, Jackson County, OR. Oregon*. Oregon Department of Geology and Mineral Industries. Open-File Report O-11-11.

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

E FK COTTONWOOD CR > COTTONWOOD CR - AT STATE LINE
KLAMATH BASIN

Water Availability as of 12/21/2015

Watershed ID #: 31420613 (Map) Exceedance Level: 80%
Date: 12/21/2015 Time: 1:24 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	3.65	0.06	3.59	0.00	0.00	3.59
FEB	11.20	0.07	11.10	0.00	0.00	11.10
MAR	12.70	0.10	12.60	0.00	0.00	12.60
APR	9.15	0.42	8.73	0.00	0.00	8.73
MAY	2.90	0.62	2.28	0.00	0.00	2.28
JUN	1.42	0.86	0.57	0.00	0.00	0.57
JUL	0.47	1.13	-0.66	0.00	0.00	-0.66
AUG	0.32	0.79	-0.47	0.00	0.00	-0.47
SEP	0.27	0.63	-0.36	0.00	0.00	-0.36
OCT	0.31	0.22	0.09	0.00	0.00	0.09
NOV	1.74	0.05	1.70	0.00	0.00	1.70
DEC	2.10	0.05	2.05	0.00	0.00	2.05
ANN	5,130.00	302.00	4,890.00	0.00	0.00	4,890.00

EMIGRANT CR > BEAR CR - AT MOUTH
ROGUE BASIN

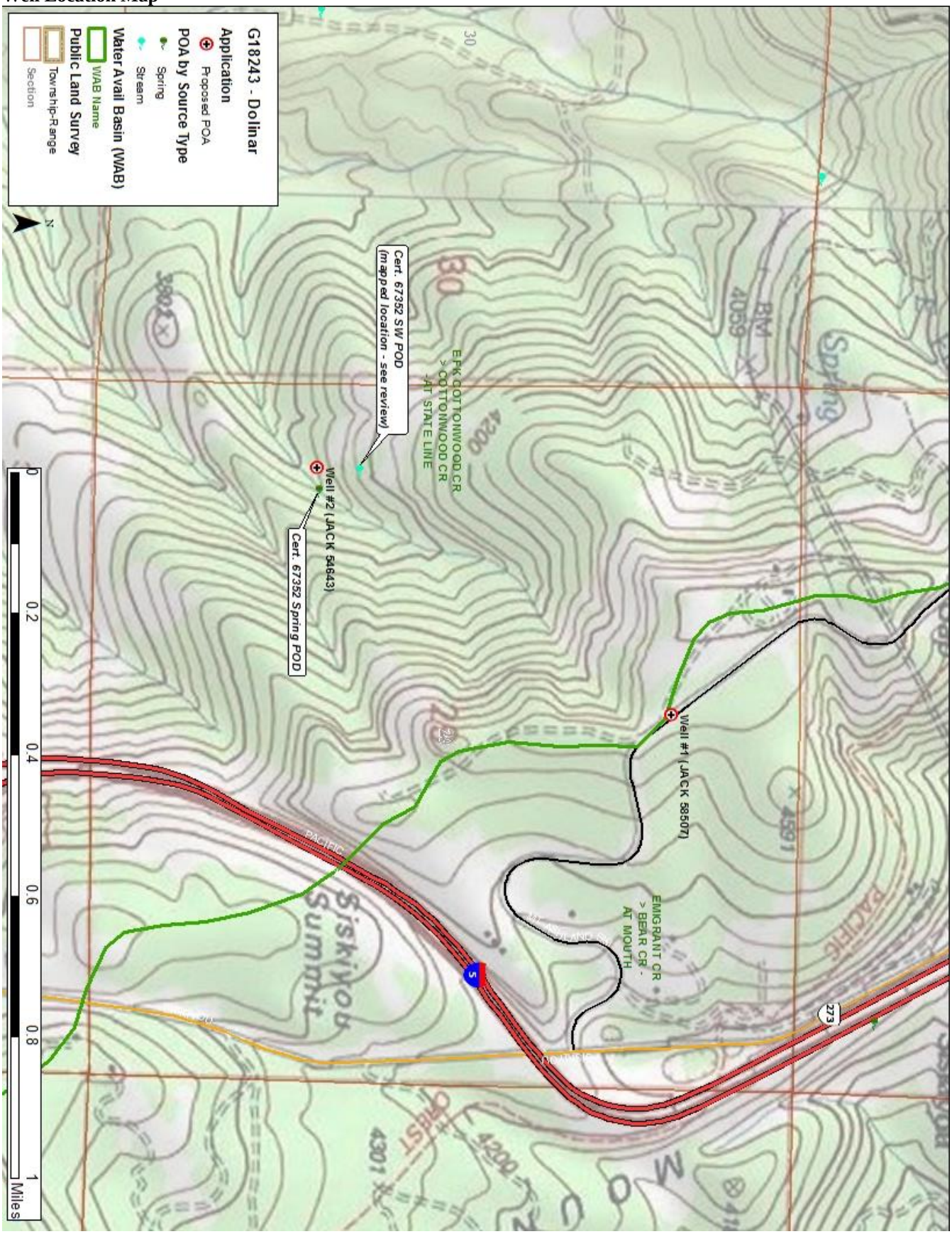
Water Availability as of 12/21/2015

Watershed ID #: 70988 (Map) Exceedance Level: 80%
Date: 12/21/2015 Time: 1:24 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	19.10	179.00	-160.00	0.00	38.00	-198.00
FEB	23.80	223.00	-199.00	0.00	48.00	-247.00
MAR	24.30	214.00	-189.00	0.00	46.00	-235.00
APR	20.30	22.00	-1.66	0.00	37.00	-38.70
MAY	17.20	35.10	-17.90	0.00	38.00	-55.90
JUN	14.10	49.50	-35.40	0.00	22.00	-57.40
JUL	6.75	66.40	-59.70	0.00	9.00	-68.70
AUG	4.79	54.70	-49.90	0.00	6.00	-55.90
SEP	4.20	35.70	-31.50	0.00	5.00	-36.50
OCT	4.60	11.50	-6.87	0.00	6.00	-12.90
NOV	7.06	59.30	-52.20	0.00	13.00	-65.20
DEC	11.90	125.00	-113.00	0.00	27.00	-140.00
ANN	17,600.00	64,600.00	1,050.00	0.00	17,700.00	0.00

Well Location Map