PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: Water Rights Section Date **October 30, 2009**

FROM: Ground Water/Hydrology Section **Karl Wozniak**
Reviewer's Name

SUBJECT: Application G- **17268** 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: **City of Monroe** County: **Benton**

A1. Applicant(s) seek(s) **0.334** cfs from **1** well(s) in the _____ Basin, _____ subbasin Quad Map: **Monroe**

A2. Proposed use: **Municipal** 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	**BENT 53718**	**Well #3**	**Bedrock**	**0.334**	**14S/5W-33 SE/NE**	**1670' S, 720' W fr NE cor S 33**
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	**282**	**19**	**9.3**	**4/10/2002**	**252**	**0-64**	**+3-65**			**230**		**Air**

Use data from application for proposed wells.

A4. **Comments:** _____

A5. ☐ **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: The well produces from a confined aquifer so the pertinent rules do not apply.

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

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 should contain condition #(s) _____;
   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 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 **bedrock** 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 subject property lies at the break in slope between Coast Range foothills on the west and the Willamette Valley lowland to the east. The foothills of the Coast Range are composed of older marine sedimentary rocks whereas the lowland is underlain by younger alluvial and lacustrine sediments which are underlain by the older marine unit at depth. The marine sedimentary rocks are part of a low-yield bedrock aquifer system that generally has low porosity, low permeability, and low well yield. Most of the available pore space in this unit is likely to occur in fractures where groundwater is confined by the low-permeability matrix. An unconfined to semi-confined aquifer occurs in the younger sediments of the valley lowland. Productive water-bearing zones in the alluvial aquifer are generally composed of porous sand and gravel beds.

The proposed POA (BENT 53718) is completed in the low-yield bedrock aquifer which is overlain by about 57 feet of alluvial sediements at the well site in section 33, T 14S, R 5W. The water table occurs at shallow depths within the alluvial sediments. Reported well yields in section 33 range from 0 to 360 gallons per minute (gpm) but the median yield is 15 gpm (based on 79 water wells with reported yields in the OWRD well log database). The well log for BENT 53718 reports a yield of 230 gpm during a one-hour air test. However, our general experience indicates that air tests tend to greatly overestimate actual well yields. Also, pumping drawdowns, which are necessary to estimate sustained yield, cannot be reliably measured during air tests. Furthermore, our general experience indicates that well yield and specific capacity (gpm/ft of drawdown) commonly decrease substantially over time in the low-yield bedrock aquifer. These considerations suggest that the applicant is unlikely to realize a yield of 150 gpm from a single bedrock aquifer well. This conclusion is consistent with data from the city's other bedrock well, BENT 50730 (POA on permit G-13575). The well log for BENT 50730 reports an air test yield of 80 gpm but a recent 4-hour pump test of the well indicates a drawdown of about 130 feet to the pump intake level after 15 minutes of pumping at an average rate of 27 gpm.

Limited water-level data show no evidence of long-term declines. Well density in the bedrock aquifer is relatively low so impacts to other wells should be minor.

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	**Low-yield bedrock (Spencer Formation)**	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: General experience indicates that the low-yield bedrock aquifer is typcally confined. Also, the well log indicates first water at 171 feet and a static water level of 9.3 feet consistent with 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**	**Long Tom River**	**273**	**265**	**650**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: The water-level elevation in the well is slightly higher than the elevation of local reaches of the Long Tom River. This indicates a component of flow towards local reaches of the Long Tom River. The efficiency of the connection is likely to be low because low-permeability confining materials (bedrock matrix and alluvial silts and clays) occur between the river and water-bearing zones in the well. However, a moderately efficient connection between the the low-yield bedrock aquifer and the alluvial aquifer is supported by a downward ambient trend in BENT 50730 prior to a 4-hour pump test (11/18/2008) which was conducted at the same time that a nearby alluvial well (BENT 7065, City of Monroe Well #1) was being pumped. A low to moderately efficient connection between the well and the river will result in very low short term impacts to the river. However, all pumping from the well will ultimately be at the expense of the river.

Water Availability Basin the well(s) are located within: WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CR AT GAGE 14174

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**	☒	☐			☐	**25.40**	☐	**<<25**	☒
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

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: Because of the complexity of the hydrologic system, no model is readily available to estimate impacts to the river. However, impacts at 30 days are likely to be much lower than 25% because of the presence of low permeability materials between the well and the stream.

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:

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.

Frank, F.J., 1976, Ground Water in the Harrisburg-Halsey Area, southern Willamette Valley, Oregon: U.S. Geological Survey Water Supply Paper 2040, 45p.

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.

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.

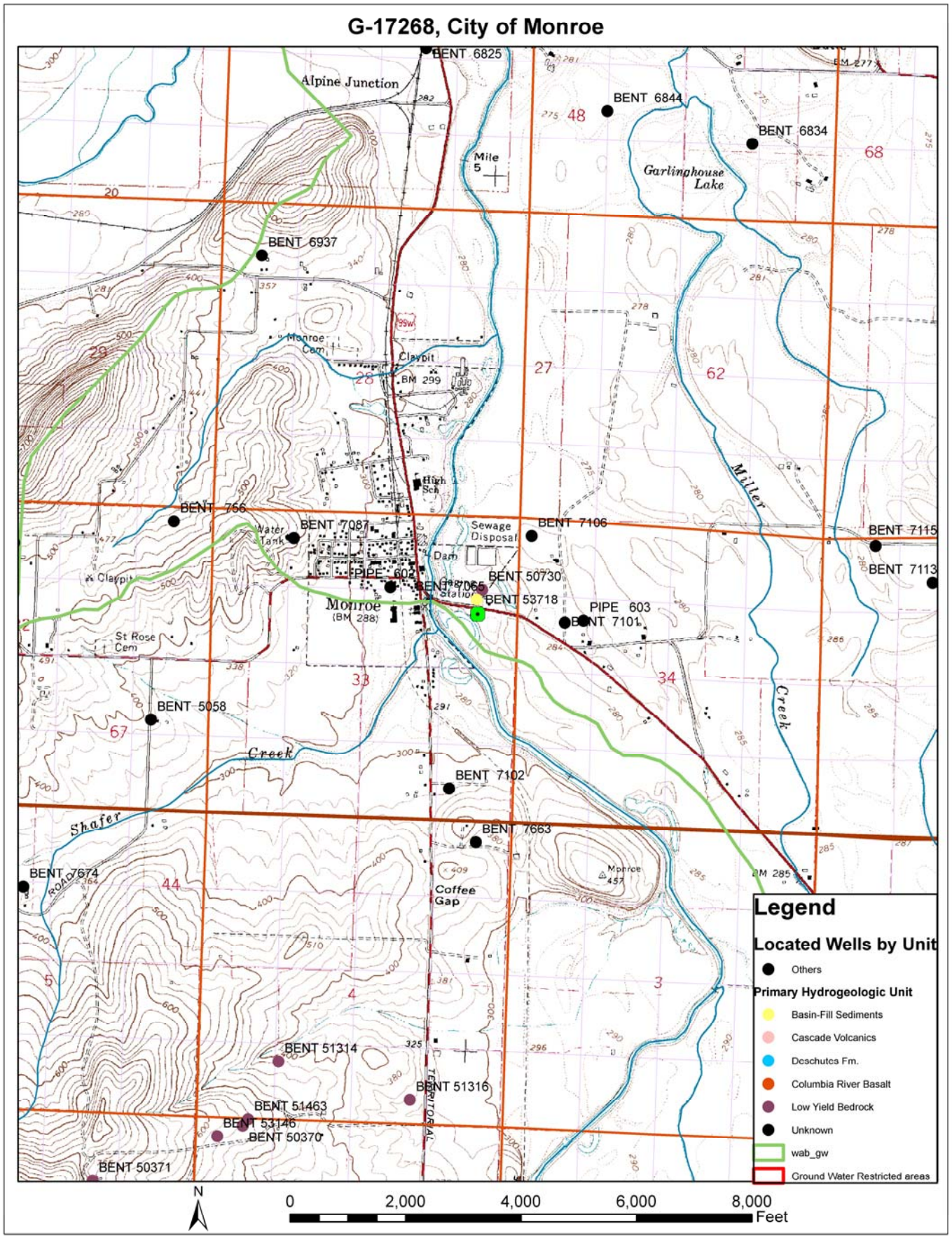
THIS SECTION TO BE COMPLETED BY ENFORCEMENT PERSONNEL

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).**

Location Map


G-17268, City of Monroe
BENT 6825
Alpine Junction
BENT 6844
BENT 6834
Mile 5
Garlinghouse Lake
BENT 6937
Monroe Cem
Claypit
BM 299
High Sch
BENT 766
Water Tank
BENT 7087
Sewage Disposal
BENT 7106
BENT 7115
Dam
PIPE 602
BENT 7065
BENT 50730
BENT 53718
BENT 7113
Monroe
(BM 288)
PIPE 603
BENT 7101
St Rose Cem
Miller
Creek
BENT 5058
Creek
BENT 7102
Shafer
BENT 7663
BENT 7674
Road
Coffee Gap
Monroe
457
BM 285
BENT 51314
BENT 51316
BENT 51463
BENT 53146
BENT 50370
BENT 50371
TERRITORIAL
Legend
Located Wells by Unit
Others
Primary Hydrogeologic Unit
Basin-Fill Sediments
Cascade Volcanics
Deschutes Fm.
Columbia River Basalt
Low Yield Bedrock
Unknown
wab_gw
Ground Water Restricted areas
N
0
2,000
4,000
6,000
8,000
Feet

Water Availability Tables

WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CR AT GAGE 14174
WILLAMETTE BASIN

Water Availability as of 10/30/2009

Watershed ID #: 30200321 Exceedance Level: 80%

Date: 10/30/2009 Time: 2:16 PM

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	10,100.00	1,330.00	8,770.00	0.00	1,750.00	7,020.00
FEB	11,600.00	4,250.00	7,350.00	0.00	1,750.00	5,600.00
MAR	11,000.00	4,520.00	6,480.00	0.00	1,750.00	4,730.00
APR	9,760.00	4,220.00	5,540.00	0.00	1,750.00	3,790.00
MAY	8,430.00	2,500.00	5,930.00	0.00	1,750.00	4,180.00
JUN	5,360.00	806.00	4,550.00	0.00	1,750.00	2,800.00
JUL	3,270.00	608.00	2,660.00	0.00	1,750.00	912.00
AUG	2,560.00	555.00	2,000.00	0.00	1,750.00	255.00
SEP	2,540.00	476.00	2,060.00	0.00	1,750.00	314.00
OCT	2,860.00	235.00	2,630.00	0.00	1,750.00	875.00
NOV	4,170.00	320.00	3,850.00	0.00	1,750.00	2,100.00
DEC	8,150.00	342.00	7,810.00	0.00	1,750.00	6,060.00
STO	7,460,000.00	1,210,000.00	6,260,000.00	0.00	1,270,000.00	4,990,000.00