State Water Resources Control Board
Order June 17, 2015

Provision 19 – Mendocino County RRFCWCID Diversion Forecast Reporting

April 1, 2016

Prepared by

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1 Introduction

This report has been prepared by the Sonoma County Water Agency (Water Agency) to fulfill the requirements of Provision 19 of the State Water Resources Control Board (State Board) Order dated June 17, 2015 (Order). The Order is a revision of the original order dated May 1, 2015 that approved the temporary urgency change petition (TUCP) filed by the Water Agency on April 22, 2015. The TUCP was filed to address low storage levels in Lake Mendocino and requested modifications to the minimum instream flow requirements for the Russian River as specified in the Water Agency's water-rights Permits 12947A, 12949, 12950 and 16596.

Provision 19 of the Order directs the Water Agency to take the following actions:

> 'To facilitate releases of Lake Mendocino stored water with minimal operational buffers, SCWA shall coordinate with the Mendocino County Russian River Flood Control and Water Conservation Improvement District (District) regarding implementation of protocols for real time 1 and 3 day advance forecasts of total diversions by all of the District's customers under all bases of right. SCWA shall provide an update to the Deputy Director regarding the outcome of consultation and the effectiveness of reporting by April 1, 2016.'

The term of the Order was 180 days from the date of the original order, ending on October 27, 2015.

2 Water Agency Coordination

The Water Agency contacted the Mendocino County Russian River Flood Control and Water Conservation Improvement District (District) in June 2015 to discuss the requirements in Provision 19 and a proposed approach for compliance. A similar order term was included in the State Board's August 25, 2014 order approving the District's 2014 TUCP. The District's 2014 TUCP requested changes in place of use to Permit 12947B. The State Board order on the District's 2014 TUCP included a term that required the District to develop a real-time forecasting plan for the District's customers' diversions. The District and Water Agency collaborated to develop an approach and protocols that were intended to provide useful and timely information to improve stream flow predictions and better manage releases from Lake Mendocino. As part of that plan, the Water Agency developed an online diversion forecast reporting tool that allowed District customers to log diversion forecasts from any web browser device with an internet connection. This online reporting tool was retooled and updated for the diversion forecast reporting required under Provision 19 of the 2015 Order.

On July 1, 2015, the Water Agency contacted the District as well as the Mendocino County Farm Bureau and provided a hyperlink to the 'Upper Russian River Mendocino County Diversion Forecast Reports' webpage for review and distribution to the District's customers. Daily reporting of the forecast diversions started the following week on July 9, 2015.

3 Diversion Forecast Reporting Program

As discussed in the previous section of this report, the protocols and tool implemented to comply with Provision 19 were based on a diversion forecasting plan developed in 2014 that the District submitted to the State Board. The Water Agency developed an online reporting tool that collected and processed information about the time, duration, location, method and rate of diversions. While the online reporting form only required that each forecasted diversion be identified by river reach, diverters optionally also could identify themselves and the specific locations of their diversions. Because the temporal impacts on stream flows of diversions from river intakes and from wells are different, each diverter was required to describe the method of diversion in the online reporting form. Information for up to five diversion forecasts could be submitted at the same time for a single river reach and single method of diversion. If a diverter's diversions were located on multiple river reaches or if the diverter operated both river intakes and wells, then a separate new online form submittal was required for each river reach and each type of diversion. Reporting protocols were established under which submittals of forecasted hourly diversions would be provided by District customers for the upcoming period of 72 hours from the daily forecast report process time at 8:00 a.m.

A screenshot of the initial webpage of the online reporting tool is included as Attachment 1. Based on the submitted forecast information, the Water Agency processed the data and developed a daily forecast report for Water Agency Operations staff.

4 Daily Forecast Reports

Daily forecast reports began on July 9, 2015 and ran through October 27. Each daily forecast report charted hourly stream flow data for the Upper Russian River gages and hourly diversion forecasts over a 10-day period. Each period included the 72-hour forecast and previous 7-day history. Each daily report listed the total reported diversions forecasted during that 10-day period and a comparison of the total of the diversions calculated from the forecasts to the expected diversions during that period. Attachment 2 includes an example of the daily forecast report that was prepared for Water Agency Operations staff.

The completeness of diversion forecasts being reported under each daily report was estimated by comparing the 10-day period total reported forecast to the total expected diversions for that period based on a monthly average daily diversion volume. A four-year average of monthly diversion data from 2010 through 2013 as reported on the District's permittee progress reports for Permit 12947B was used as the basis of comparison. The calculated average monthly diversions and the total diversion forecasts reported are shown in Table 1.

Table 1: Estimated Monthly Diversions Assumed for RRFC Customers

	July	August	September	October	Total
Estimated Total Diversions (ac-ft)	1,091	761	1,000	702	3,554
Total Forecasted Diversions (ac-ft)	211	214	192	233	849
Estimated Percentage Represented by Reported Diversions	19%	28%	19%	33%	24%

5 Program Review

A summary of the daily river conditions over the reporting period and the forecasted diversions is included as a chart in Attachment 3. The daily average recorded stream flows at the river gages and the total diversions forecasted for the District's service area are plotted and provided in tabular format. As discussed in the previous section of this report, the total of the daily diversion forecasts was only a small portion of the total estimated total diversions. As shown in Table 1, during the full period of diversion forecast reporting, it was estimated that forecasts were provided for about 24% of the total estimated diversions by District customers. . The primary reason for this relatively small percentage is that only a relatively small percentage of the District's contractors participated in the program. For example, there is no indication that any of the municipal water providers that have contracts with the District participated in the diversion forecast reporting program.

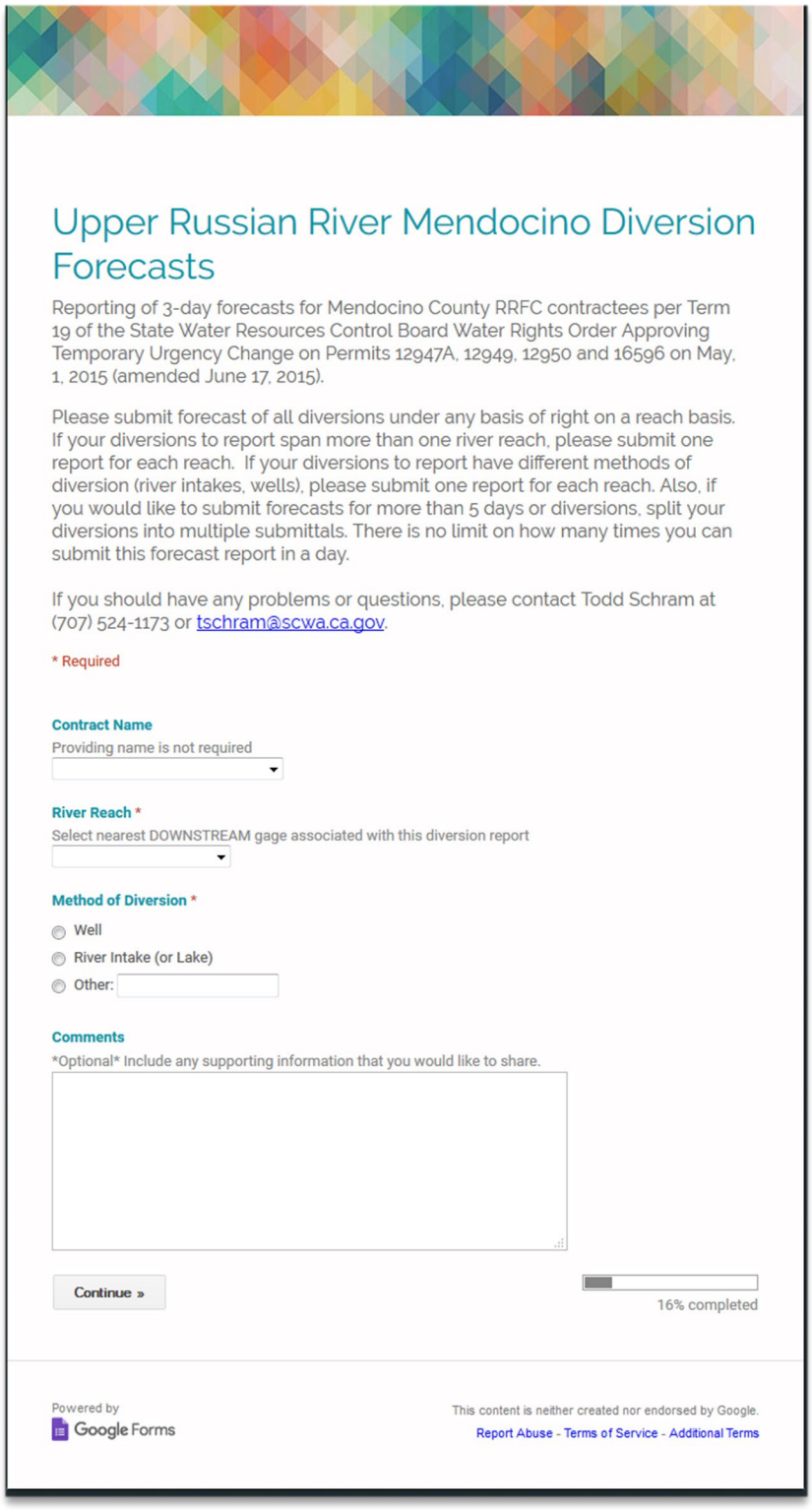
Even if all District contractors were to participate in the diversion forecast program, it still would underestimate total diversions under all water-right claims, because there are diversions under other water-right claims that would not be included in the program. This point is illustrated by Table 2. This table shows the monthly observed losses over the three listed river reaches. The total reported diversions that were forecasted represent about 11% of the total observed losses (849/7,459 = 0.11). If all diversions in the Upper Russian River by District customers were reported, forecasts would be expected to represent about half of the total observed reach losses. The remainder of the observed losses may be attributed to other surface water diversions, groundwater pumping and recharge, evaporation, and riparian corridor vegetation.

Table 2: Observed Monthly Reach Losses in 2015 (ac-ft)

Reach	July	August	September	October	Total
Forks-Talmage	1,826	1,419	887	986	5,118
Talmage-Hopland	707	172	313	319	1,511
Hopland-Cloverdale	99	353	185	192	830
Total	2,631	1,944	1,385	1,497	7,459

During the summer of 2015, Water Agency Operations staff considered the daily forecasted diversion reports when evaluating river conditions and setting reservoir release rates. However, for these daily forecasted diversion reports to be very useful for Water Agency Operations staff, there would have to be much higher participation rates by diverters with District contracts, a similar program for diverters that do not have contracts with the District, and more-detailed information regarding the timing of the effects of the pumping various wells on surface flows in the river.

Attachment 1 – Online Diversion Forecast Reporting Tool



Upper Russian River Mendocino Diversion Forecasts

Reporting of 3-day forecasts for Mendocino County RRFC contractees per Term 19 of the State Water Resources Control Board Water Rights Order Approving Temporary Urgency Change on Permits 12947A, 12949, 12950 and 16596 on May. 1, 2015 (amended June 17, 2015).

Please submit forecast of all diversions under any basis of right on a reach basis. If your diversions to report span more than one river reach, please submit one report for each reach. If your diversions to report have different methods of diversion (river intakes, wells), please submit one report for each reach. Also, if you would like to submit forecasts for more than 5 days or diversions, split your diversions into multiple submittals. There is no limit on how many times you can submit this forecast report in a day.

If you should have any problems or questions, please contact Todd Schram at (707) 524-1173 or tschram@scwa.ca.gov.

* Required

Contract Name

Providing name is not required

River Reach *

Select nearest DOWNSTREAM gage associated with this diversion report

Method of Diversion *

- Well
- River Intake (or Lake)
- Other:

Comments

Optional Include any supporting information that you would like to share.

Continue »

16% completed

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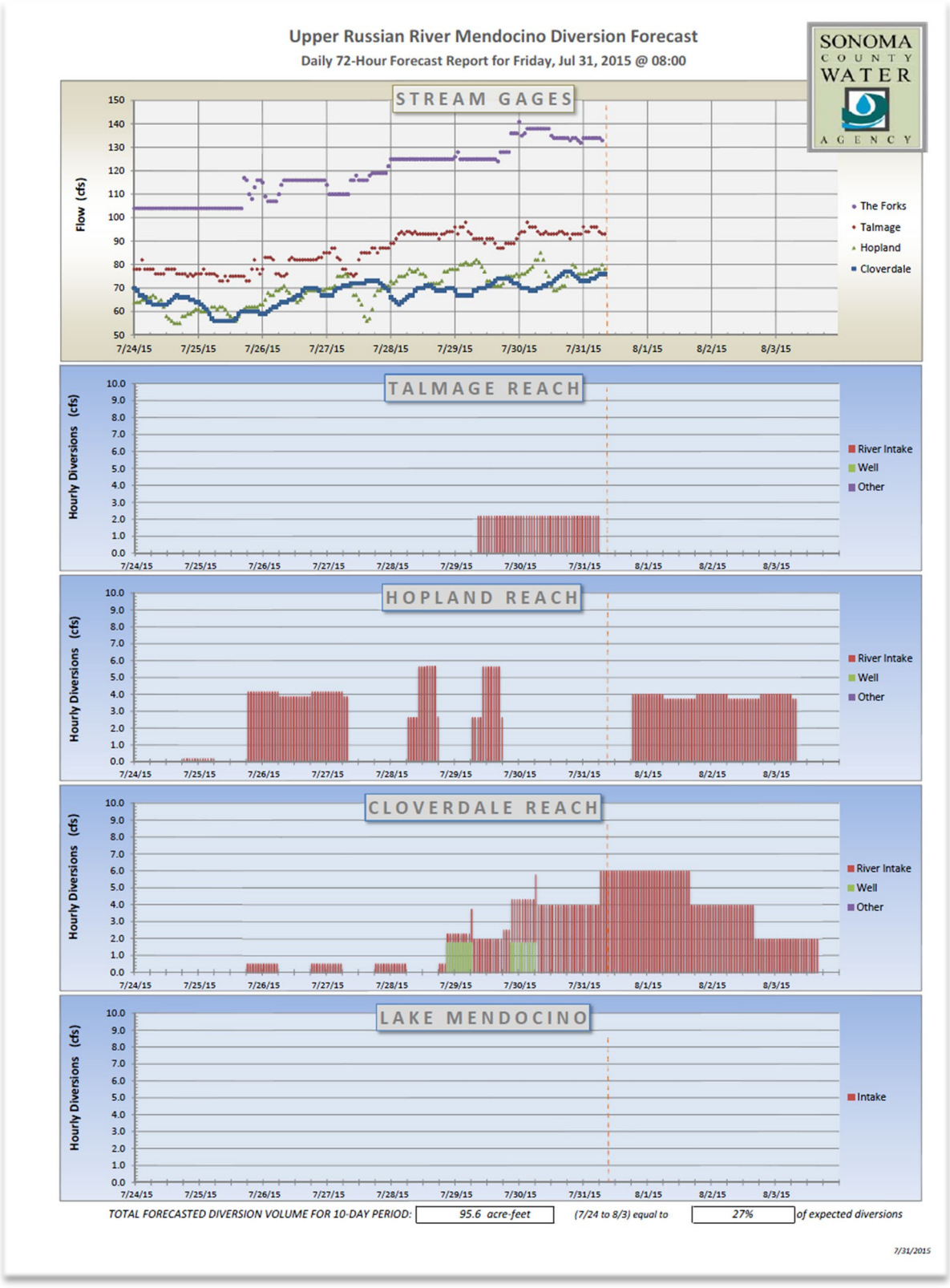
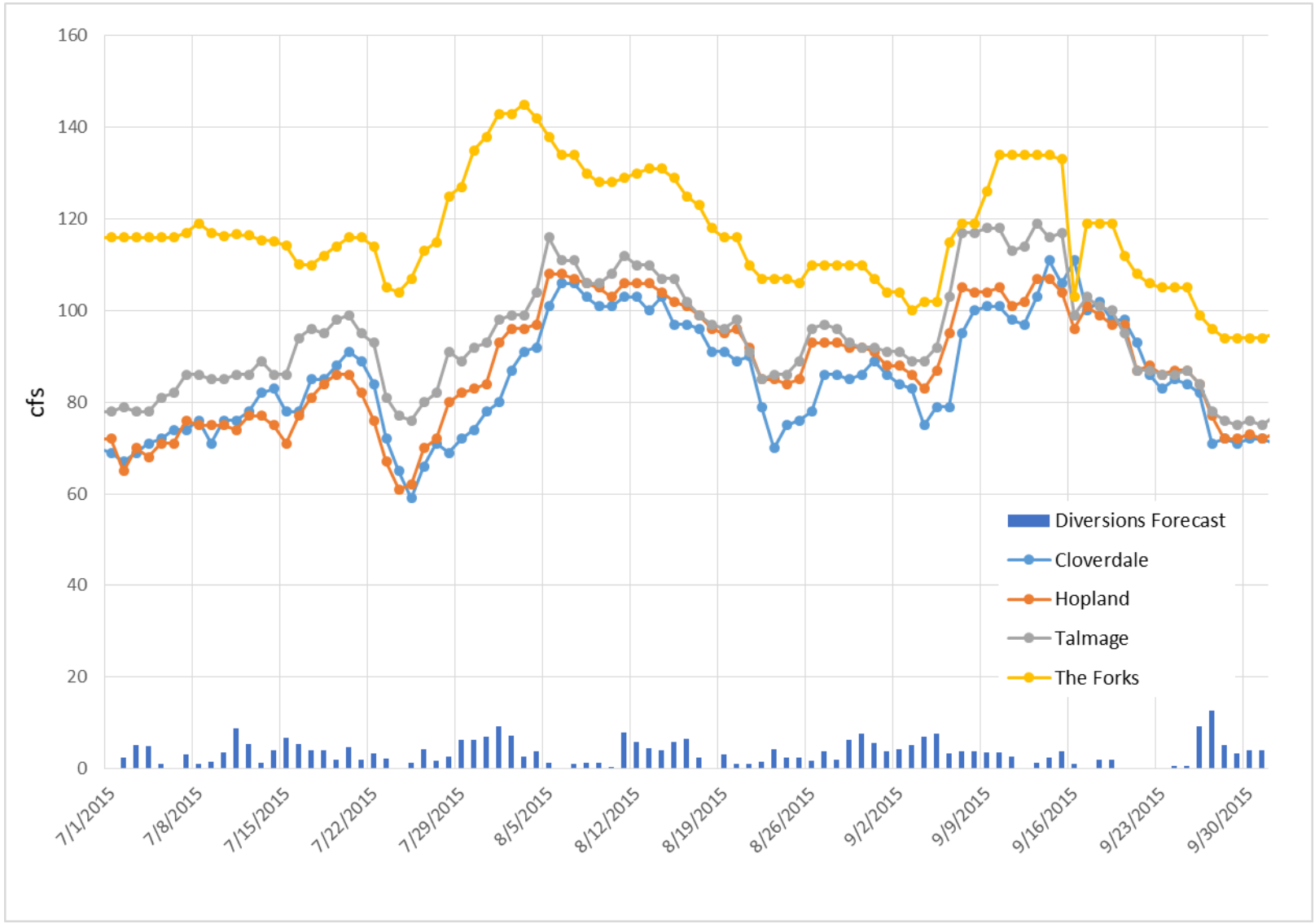
Attachment 2 – Example of Daily Diversion Forecast Report



Attachment 3 – Summary of Daily River Gage Flow Rates and Reported Forecast Diversions



	USGS Gage Stream Flow				Forecasted Diversion Total	
Date	The Forks (cfs)	Cloverdale (cfs)	Hopland (cfs)	Talmage (cfs)	(cfs)	(ac-ft)
7/1/2015	116	69	72	78	0.0	0.0
7/2/2015	116	67	65	79	2.4	4.7
7/3/2015	116	69	70	78	5.2	10.2
7/4/2015	116	71	68	78	4.9	9.6
7/5/2015	116	72	71	81	1.1	2.1
7/6/2015	116	74	71	82	0.1	0.1
7/7/2015	117	74	76	86	3.0	6.0
7/8/2015	119	76	75	86	1.0	2.0
7/9/2015	117	71	75	85	1.6	3.2
7/10/2015	116	76	75	85	3.5	6.9
7/11/2015	117	76	74	86	8.8	17.4
7/12/2015	116	78	77	86	5.5	10.8
7/13/2015	115	82	77	89	1.3	2.6
7/14/2015	115	83	75	86	4.1	8.2
7/15/2015	114	78	71	86	6.6	13.1
7/16/2015	110	78	77	94	5.4	10.7
7/17/2015	110	85	81	96	4.0	8.0
7/18/2015	112	85	84	95	4.0	8.0
7/19/2015	114	88	86	98	2.0	4.0
7/20/2015	116	91	86	99	4.7	9.3
7/21/2015	116	89	82	95	2.0	4.0
7/22/2015	114	84	76	93	3.3	6.6
7/23/2015	105	72	67	81	2.2	4.3
7/24/2015	104	65	61	77	0.1	0.1
7/25/2015	107	59	62	76	1.2	2.5
7/26/2015	113	66	70	80	4.3	8.6
7/27/2015	115	71	72	82	1.6	3.3
7/28/2015	125	69	80	91	2.7	5.4
7/29/2015	127	72	82	89	6.2	12.3
7/30/2015	135	74	83	92	6.4	12.7
7/31/2015	138	78	84	93	7.1	14.0
8/1/2015	143	80	93	98	9.3	18.4
8/2/2015	143	87	96	99	7.3	14.4
8/3/2015	145	91	96	99	2.7	5.3
8/4/2015	142	92	97	104	3.8	7.6
8/5/2015	138	101	108	116	1.3	2.7
8/6/2015	134	106	108	111	0.0	0.0
8/7/2015	134	106	107	111	0.9	1.9
8/8/2015	130	103	106	106	1.2	2.3

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Date	The Forks (cfs)	Cloverdale (cfs)	Hopland (cfs)	Talmage (cfs)	(cfs)	(ac-ft)
8/9/2015	128	101	105	106	1.2	2.5
8/10/2015	128	101	103	108	0.4	0.8
8/11/2015	129	103	106	112	7.9	15.6
8/12/2015	130	103	106	110	5.8	11.5
8/13/2015	131	100	106	110	4.5	8.8
8/14/2015	131	103	104	107	4.0	7.9
8/15/2015	129	97	102	107	5.8	11.5
8/16/2015	125	97	101	102	6.6	13.1
8/17/2015	123	96	99	99	2.4	4.7
8/18/2015	118	91	96	97	0.1	0.1
8/19/2015	116	91	95	96	3.0	6.0
8/20/2015	116	89	96	98	1.0	2.1
8/21/2015	110	90	92	91	1.1	2.2
8/22/2015	107	79	85	85	1.5	2.9
8/23/2015	107	70	85	86	4.1	8.2
8/24/2015	107	75	84	86	2.4	4.8
8/25/2015	106	76	85	89	2.4	4.7
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8/31/2015	107	89	91	92	5.6	11.1
9/1/2015	104	86	88	91	3.7	7.4
9/2/2015	104	84	88	91	4.2	8.3
9/3/2015	100	83	86	89	5.1	10.1
9/4/2015	102	75	83	89	6.9	13.7
9/5/2015	102	79	87	92	7.7	15.3
9/6/2015	115	79	95	103	3.4	6.8
9/7/2015	119	95	105	117	3.8	7.6
9/8/2015	119	100	104	117	3.9	7.7
9/9/2015	126	101	104	118	3.5	6.9
9/10/2015	134	101	105	118	3.5	6.9
9/11/2015	134	98	101	113	2.7	5.3
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