State Water Resources Control Board
Order of June 14, 2021

Term 12

Lake Sonoma and Lower Russian River

Water Accounting Methodology

July 19, 2021

Prepared by

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1 Introduction

On May 13, 2021, the Sonoma County Water Agency (Sonoma Water) submitted a temporary urgency change petitions requesting modifications to water right Permits 12947A, 12949, 12950 and 16596. The requested changes were to establish the water supply conditions in the Russian River system as *Critical,* thereby setting minimum instream flow requirements in the Upper and Lower Russian River to more appropriate flow rates given the water supply constraints and drought severity in the watershed. On June 14, 2021, the State Water Resources Control Board (State Water Board) issued the order (Order) approving Sonoma Water's petitions. Under the requirements of Term 12 of the Order, Sonoma Water was directed to develop a methodology for water accounting in Lake Sonoma on Dry Creek and the Lower Russian River. This term requires the methodology be used to issue weekly reports to the State Water Board Deputy Director and publish to a public website. An accounting methodology for the Upper Russian River was developed and weekly reports implemented under the requirements of Term 11 of the amended order issued on February 11, 2021 on Sonoma Water's temporary urgency change petition filed on January 7, 2021. Term 13 of the Order continues the weekly reporting of the Upper Russian River water accounting.

Term 12 requires the following to be submitted by July 15, 2021:

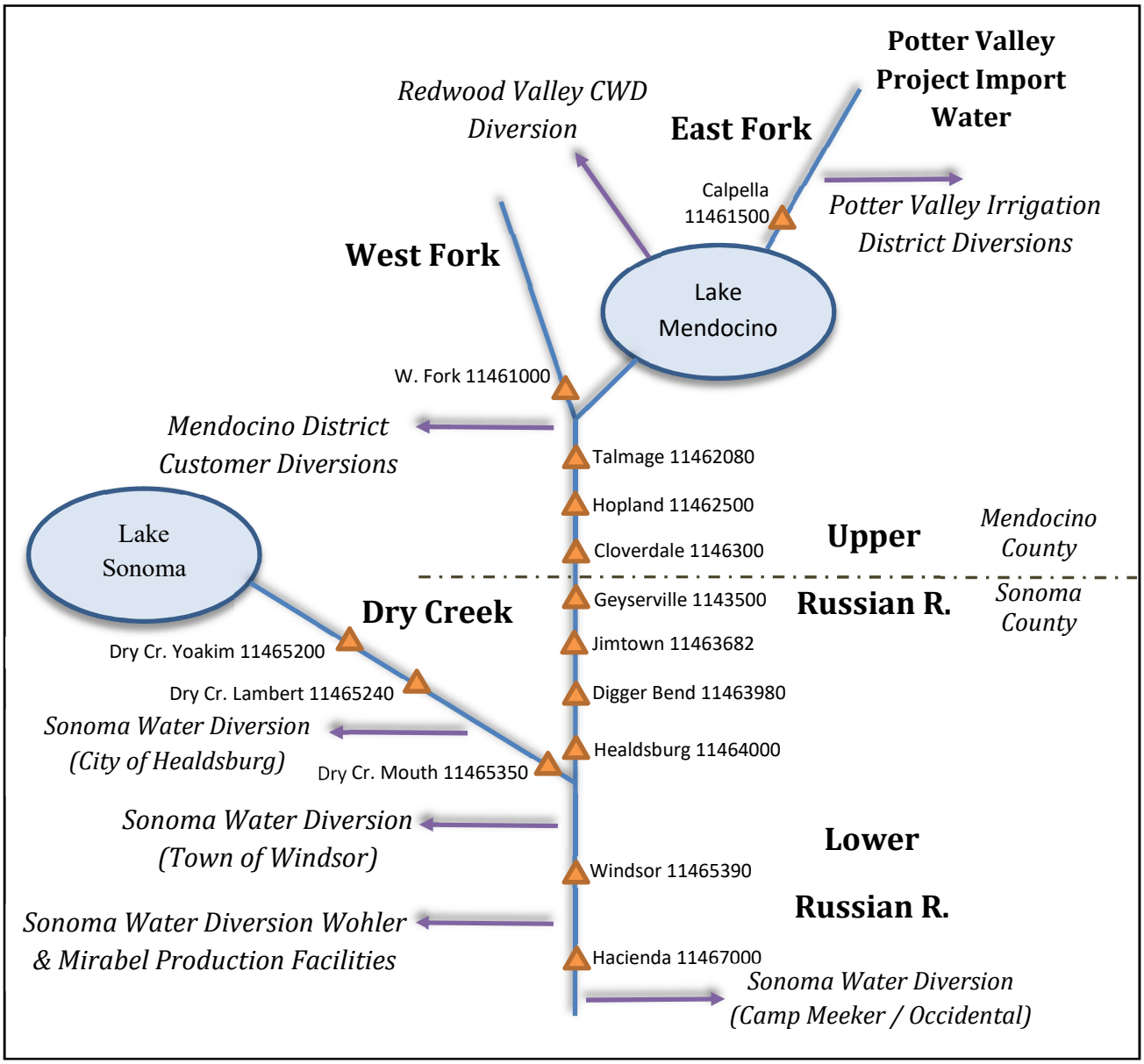
> '…a proposed accounting methodology to the Deputy Director that characterizes water flowing into (inflow) and released from Lake Sonoma, flows in the Lower Russian River, and the rediversion of water by Sonoma Water or its contractors. The accounting methodology shall be sufficient to define, distinguish, and quantify the following:
>
> a. Inflows from water native to the watershed.
>
> b. Releases from Lake Sonoma that constitute bypass of water, water released from storage for downstream deliveries, or water released from storage to maintain instream flows.
>
> c. Releases from Lake Sonoma that are rediverted by Sonoma Water or its water contractors or purchasers.
>
> d. Flows in the Lower Russian River that originate from Lake Mendocino releases.
>
> e. Reach losses in Dry Creek and the Lower Russian River.
>
> f. Sonoma Water may choose to include additional inflow or outflow categories not listed under a, b, and c in the accounting methodology. Explanations for each category and how it is defined shall be included in the proposed accounting methodology. '

Sonoma Water understands that the State Water Board may submit requested revisions to the accounting methodology. Any revisions requested by the State Water Board shall be implemented within 30 days. The water accounting reports will be published to Sonoma Water's website at https://www.sonomawater.org/tucp.

2 Russian River System

The Russian River is approximately 110 miles long with a watershed that spans more than 1,485 square miles. A schematic of the major features and reaches of the Russian River related to the water accounting effort is presented in Figure 1. The headwaters of the East and West Forks of the Russian River are north of the City of Ukiah in Mendocino County. The East Fork originates in Potter Valley and receives transfers from the Eel River watershed to the north through the Potter Valley Project, a hydroelectric project operated by PG&E. The Potter Valley Irrigation District has a water supply contract with PG&E that serves as their primary water supply. The Coyote Valley Dam that forms Lake Mendocino is located further downstream on the East Fork just prior to the confluence with the West Fork. In the most general terms, the river can be divided into two reaches, the Upper Russian and the Lower Russian with the confluence of Dry Creek as the boundary between the two reaches. The Warm Springs Dam that forms Lake Sonoma lies on Dry Creek. Lake Sonoma and Lake Mendocino are operated by Sonoma Water for water supply. Storage releases from the two reservoirs are used to meet minimum instream flow requirements and satisfy downstream diversions for water users authorized to redivert project water (reservoir releases of stored water).

Figure 1: Schematic of Russian River Reaches



3 Lake Sonoma Operations

Sonoma Water is the local sponsor for Lake Sonoma, a U.S. Army Corps of Engineers (USACE) facility, and is responsible for making water supply releases in compliance with its water right permits. As the local sponsor, Sonoma Water has the exclusive right to control releases from the water supply pool. Under flood control operations, reservoir releases are performed by the USACE.

Sonoma Water makes releases from Warm Springs Dam at Lake Sonoma to maintain the minimum instream flow requirements specified in its water right permits and support Sonoma Water diversions from points downstream in Dry Creek and the Russian River. These releases are made by Sonoma Water

when reservoir storage levels are in the water supply pool, defined currently as below 245,000 acre-feet as documented in the facility's Water Control Manual.

Under standard operations, Sonoma Water makes release decisions from Lake Sonoma based on compliance with minimum instream flow requirements in its water right permits at compliance gage locations in Dry Creek and the Lower Russian River. Lake Sonoma and Lake Mendocino are operated conjunctively, but because Lake Sonoma is significantly larger, compliance with minimum instream flow requirements in the Lower Russian River is largely met by releases from Lake Sonoma, particularly under *Dry* and *Critical* water year classifications.

The minimum instream flow requirement for Dry Creek downstream of Lake Sonoma varies by time of year and water-year type (Table 1), ranging from 25 cfs during the period of April 1 to October 31 under *Critical* conditions to 105 cfs from November 1 to December 31 under *Normal* conditions. The minimum instream flow requirements for the Lower Russian River that apply year-round are 125 cfs under *Normal* conditions, 85 cfs under *Dry* conditions, and 35 cfs under *Critical* conditions.

Table 1: Dry Creek minimum instream flow requirements

Water Supply Conditions	Minimum Instream Flow Requirement (CFS)	Date Range
Normal	75	1/1–4/30
	80	5/1–10/31
	105	11/1–12/31
Dry	25	4/1–10/31
	75	11/1–3/31
Critical	25	4/1–10/31
	75	11/1–3/31

4 Watershed Water Rights

To perform a proper water accounting in the Russian River, a methodology must account for the amount of the various water sources types in each reservoir and reach and the transactions of inflows and outflows for each water source. Diversions under water rights in the watershed are a major component of the outflows or reach losses observed during the dry season. The accounting methodology report for Lake Mendocino and the Upper Russian River prepared under the requirements of Term 11 for the February 11, 2021 Order addresses the categories of water rights present in the Russian River watershed and their relative priorities to the three main types of water present downstream of Lake Mendocino—natural flow, imported water and reservoir storage water. For Lake Sonoma and Dry Creek, the water

accounting is less complex as there is only natural flow and reservoir storage water. Additionally, Sonoma Water is the sole entity authorized to redivert storage water released from Lake Sonoma. Stored water releases are also used to meet minimum instream flow requirements.

In the Lower Russian River, downstream of the confluence of the Upper Russian River and Dry Creek, water accounting includes all water source types from the upstream reaches.

5 Water Accounting

Sonoma Water has developed an updated water accounting methodology to be implemented in producing a weekly report that characterizes the inflows and releases from Lake Sonoma, as well as the origin and reach losses of flows in the Lower Russian River and Dry Creek. The water accounting methodology outlined below augments the methodology developed to characterize the inflows and releases of Lake Mendocino under Term 11 of the order dated February 11, 2021. The methodology uses available measured data, estimated data, and assumptions to provide estimates of water availability by source on a daily basis. The weekly water accounting report includes a review of all three reaches: the Upper Russian, Dry Creek, and the Lower Russian.

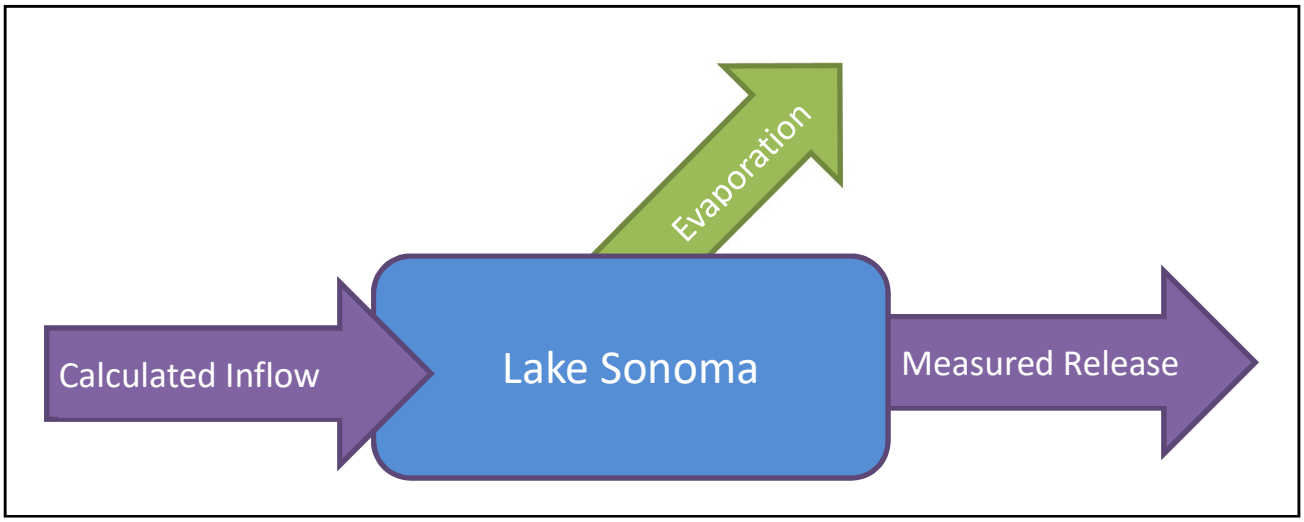
Lake Sonoma Inflow

Unlike Lake Mendocino, which includes imported water from the Eel River via the Potter Valley Project, inflow into Lake Sonoma is comprised solely of natural flow native to the Dry Creek watershed. The USACE calculates natural inflow for Lake Sonoma based on a water balance for the reservoir, similar to the approach used for Lake Mendocino. Figure 2 documents the components of the water balance considered in the USACE calculation. The simplified equation for the water balance is:

$$V_{Inflow} = \left(\Delta S_{Lake\ Sonom} + \left(V_{Release} + V_{Evaporation}\right)\right)$$

The volume of the inflow is calculated as the daily change in storage plus the volume of the reservoir release plus the calculated reservoir evaporation. This is a simplification of the complete water balance that would also include reservoir seepage, which is assumed to be negligible.

Figure 2: General Reservoir Water Balance for Lake Sonoma



Lake Sonoma Reservoir Releases

The USACE maintains and publishes the release gage data for the Warm Springs Dam. The components of those releases can be characterized as pass-through water, water released from storage for downstream Sonoma Water rediversions, and water released from storage to maintain instream flows. To determine the components of the releases from the reservoir, it is important to characterize the state of the reservoir as operating under collection, withdrawal, or regulation. For our approach, it is assumed that any increases in storage are collection and decreases in storage are withdrawals that pass-through all natural flow and any additional withdrawals are releases of stored water. Attachment 1 shows an example of the complete water accounting report to be issued by Sonoma Water that satisfies Terms 12 and 13 of the Order.

Lake Sonoma Storage Withdrawals

Sonoma Water has four water right permits--Permits 12947A, 12949, 12950 and 16596--from which to claim authorized diversions. Under the current drought conditions, Sonoma Water diversions are anticipated to be fulfilled solely under Permit 16596, which authorizes direct diversion and rediversion of stored water releases from Lake Sonoma. Under Term 14 of the Order, Sonoma Water and its customers are prohibited from rediverting storage releases from Lake Mendocino under Permit 12947A. Permits 12949 and 12950 are direct diversion rights that authorize diversions of non-project water which is anticipated to remain in low supply.

Under water supply agreements, Sonoma Water provides water to four water systems that may divert water under Sonoma Water's water rights. Table 2 summarizes the details of water use under Sonoma Water water rights and the terms associated water supply agreements. Of the four water systems, only the Town of Windsor water supply agreement is used on a continual basis as its primary water source. The City of Healdsburg and the communities of Camp Meeker and Occidental have water supply agreements that serve as a backup supply for times when their water rights are deficient.

Table 2: Review of Water Use under Sonoma Water's Water Rights

Entity	POD(s)	Permit / Agreement Max Rate (gpm)	Actual Production Capacity (gpm)	Actual Limit (ac-ft)	Typical Diversions under Sonoma Water Rights
Sonoma Water	Wohler & Mirabel Collector Wells	41,290	64,000	37,544	Year-round primary supply source
a) Town of Windsor	Russian River Wellfield	5,000	5,000	4,725	Year-round primary supply source
b) City of Healdsburg	Gauntlett & Fitch Mountain Wellfields (Russian River); Dry Creek Wellfield	4,375	2,825	425	None on Russian River; Limited use on Dry Creek from Nov 1 – Mar 31
c) Camp Meeker / Occidental	River Well (Russian River)	100	100	35	Limited use from Nov 1 – Jun 30 under dry conditions

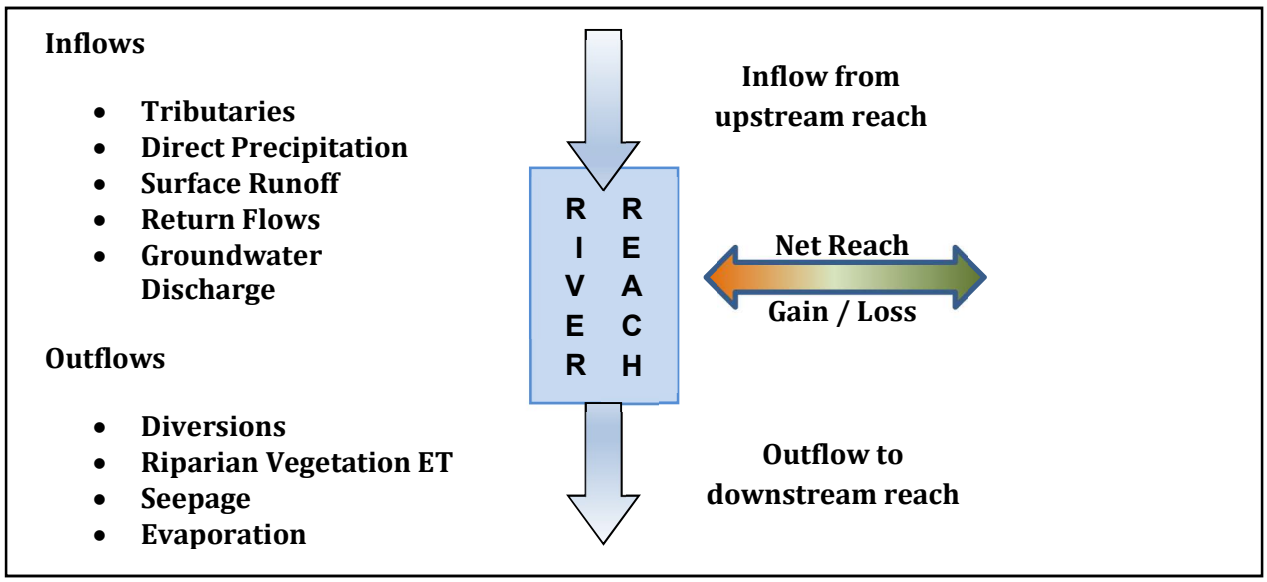
Operationally, Sonoma Water makes releases from Coyote Valley Dam to meet the demands and minimum instream flow requirements on the Upper Russian River reach only. Withdrawals from Warm Springs Dam augment these flows at the confluence of Dry Creek to maintain minimum instream flows on the Lower Russian River and satisfy diversions by Sonoma Water and its customers.

Reach Losses

A combination of reservoir release data and streamflow measurements from stream gages distributed throughout the Russian River watershed are used to delineate stream sub-reaches in the Upper and Lower Russian River and Dry Creek (Fig. 1). With these measurements, net streamflow losses for each sub-reach are estimated by calculating travel-time adjusted differences in streamflow between upstream and downstream gages. Reach travel times were developed based on relationships established with stream flow rates. Curves plotting travel time versus stream discharge were extrapolated from observed travel times using a power law function[1] fitted to travel-time observations for each stream gage (Attachments 2 through 4). Net reach losses are the cumulative gain/loss comprised of many potential inflows and outflows, shown conceptually in Figure 3. Estimating individual reach loss components on the Russian River and Dry Creek remains a challenge given the large number of diverters, as well as the spatially and temporally dynamic nature of diversions, tributary contributions, riparian evapotranspiration, and groundwater/surface-water interactions.

[1] Jobson, Harvey E. *Estimating the variation of travel time in rivers by use of wave speed and hydraulic characteristics*. No. 4187. US Department of the Interior, US Geological Survey, 2000.

Figure 3: Reach Water Balance



5.1.1 Reach Losses—Upper Russian River

The Upper Russian River, from the Forks to the Dry Creek confluence, has seven USGS stream gages (USGS 11462080, 11462500, 11463000, 11463500, 11463682, 11463980, 1146400; Fig. 1). Using six of these gages, six sub-reaches can be delineated along the Upper River, for which reach losses can be estimated. Travel time estimates[1] used to calculate net reach losses between gages are provided in Attachment 2.

5.1.2 Reach Losses—Dry Creek

For Dry Creek, the Warm Springs Dam release gage and three additional USGS stream gages (USGS 11465200, 11465240, 11465350; Fig. 1) comprise four gage observations on Dry Creek and delineate three sub-reaches between Warm Springs Dam and the confluence with the Russian River. Travel time estimates[1] used to calculate net reach losses between gages are provided in Attachment 3.

5.1.3 Reach Losses—Lower Russian River

The Lower Russian River has two USGS stream gages (USGS 1145390, 11467000; Fig. 1) downstream of the Dry Creek confluence. These gages combined with the calculated flow that is estimated downstream of the confluence from USGS 11465350 (Dry Creek Mouth) and 11464000 (Russian River at Healdsburg) delineate the two sub-reaches for analysis. Similar to the Upper Russian River and Dry Creek, reach losses are estimated for the sub-reaches between stream gages using estimated travel times (Attachment 4). Estimated travel times from 11464000 (Russian River at Healdsburg) to 11465390 (Russian River at Windsor) are not calibrated with observed travel times (Attachment 3) because 11465390 is operated seasonally, and thus has a limited period of record to calculate observed travel times.

Attachment 1 – Example Weekly Accounting Report: Lake Mendocino - Upper Russian

Lake Mendocino and Lake Sonoma Water Accounting Weekly Report (Terms 12 & 13 June 2021 TUCO)

Report Date: 7/16/2021

Units are cfs unless noted otherwise

			7/9/2021	7/10/2021	7/11/2021	7/12/2021	7/13/2021	7/14/2021	7/15/2021
I. Upper East Fork Reach									
Potter Valley Project									
Tunnel Diversion			30.0	30.0	30.0	30.0	30.0	30.0	30.0
PVID Requested Delivery			25.0	25.0	25.0	25.6	30.0	30.5	35.0
PVID Canals Actual Delivery			10.8	10.8	10.8	10.8	16.3	16.4	17.1
East Fork Release			19.2	19.2	19.2	19.2	13.7	13.6	12.9
PVID E Fork Diversions			14.2	14.2	14.2	14.8	13.7	14.1	17.9
PVID Water Use - PG&E Contract			25.0	25.0	25.0	25.6	30.0	30.5	35.0
PVID Water Use - License 5264			0.0	0.0	0.0	0.0	0.0	0.0	0.0
East Fork Downstream of PVID			5.0	5.0	5.0	4.4	0.0	-0.5	-5.0
PVID Canal Net Return Flow (assumed)			3.8	2.9	7.4	8.4	9.2	8.6	14.3
East Fork / Potter Valley Reach Analysis									
USGS E Fork @ Calpella			8.8	7.9	12.4	12.8	9.2	8.2	9.3
Net Reach Loss(-)/Gain(+)			-21.2	-22.1	-17.6	-17.2	-20.8	-21.8	-20.7
Unimpaired Natural Flow @ Calpella (est.)			0.0	0.0	0.0	0.0	0.0	0.0	0.0
Non-PVID East Fork Net Reach Losses (est.)			0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Flow			0.0	0.0	0.0	0.0	0.0	0.0	0.0
Import (neg. value is return flow)			0.0	0.0	0.0	0.0	0.0	0.0	0.0
II. Lake Mendocino									
Resrvoir Operations									
Calculated Inflow (ac-ft)			34.5	12.5	29.6	8.1	4.9	27.9	6.3
(cfs)			17	6	15	4	2	14	3
Natural Flow			0	0	0	0	0	0	0
Import			17	6	15	4	2	14	3
Storage Change (ac-ft)			-158.0	-179.0	-155.0	-188.0	-198.0	-175.0	-195.0
(cfs)			-80	-90	-78	-95	-100	-88	-98
Stored Natural Flow (cfs)			0	0	0	0	0	0	0
Stored Import Water (cfs)			0	0	0	0	0	0	0
Evaporation (ac-ft)			25.9	25.0	25.6	24.7	23.9	22.4	20.8
RVCWD Diversion (ac-ft) (est.)			0	0	0	0	0	0	0
CVD Release Gage			84	84	80	86	90	91	91
Storage (Project Water)			67	78	65	82	88	77	88
Natural Flow			0	0	0	0	0	0	0
Import Water			17	6	15	4	2	14	3
East Fork Min Instream Flow Requirement			25	25	25	25	25	25	25
Compliance Gage		*Rvr mi.*							
CVD Release		*99.9*	84	84	80	86	90	91	91
CVD Project Water Release to Meet Min Flow Requirement									
Total Pass-through Water			17	6	15	4	2	14	3
Project Water Release Required			Yes	Yes	Yes	Yes	Yes	Yes	Yes
III. Upper Russian River Reach									
Minimum Instream Flow Requirement			15	15	15	15	15	15	15
Controlling Compliance Gage									
Min Gage Flow			28	25	24	25	25	26	26
Controlling Gage			Healdsburg	Healdsburg	Healdsburg	Healdsburg	Healdsburg	Healdsburg	Healdsburg
All Compliance Gages		*Rvr mi.*							
Forks	(CVD + USGS 11461000)	*99.0*	84	84	80	86	90	91	91
Talmage	(USGS 11462080)	*96.1*	68	67	68	69	71	71	70
Hopland	(USGS 11462500)	*84.8*	56	55	56	59	59	62	59
Cloverdale	(USGS 11463000)	*70.9*	56	55	55	58	62	63	56
Geyserville	(USGS 11463500)	*54.4*	41	39	39	38	42	44	46
Jimtown	(USGS 11463682)	*48.5*	33	30	30	31	31	33	33
Digger Bend	(USGS 11463980)	*38.2*	30	26	26	26	27	27	26
Healdsburg	(USGS 11464000)	*35.6*	28	25	24	25	25	26	26
Net Reach Loss(-)/Gain(+)									
Forks - Talmage			-16	-16	-13	-16	-19	-20	-22
Talmage - Hopland			-12	-12	-12	-9	-11	-12	-10
Hopland - Cloverdale			-5	-4	-5	-5	-3	-3	-5
Cloverdale - Jimtown			-22	-23	-22	-20	-19	-23	-23
Jimtown - Digger Bend			-4	-5	-4	-4	-4	-5	-6
Digger Bend - Healdsburg			-2	-2	-2	-1	-1	-1	-1
Upper Russian Net Reach Loss/Gain			-63	-62	-56	-55	-58	-64	-67
CVD Project Water Release to Meet Min Flow Requirement									
Net Reach Loss(-)/Gain(+) to Controlling Gage			-63	-62	-56	-55	-58	-64	-67
Storage (Project Water)			+63	+62	+56	+55	+58	+64	+67
Pass-through Water (Natural + Import)			+0	+0	+0	+0	+0	+0	+0
Total Pass-through Water			17	6	15	4	2	14	3
Project Water Release Required			No	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

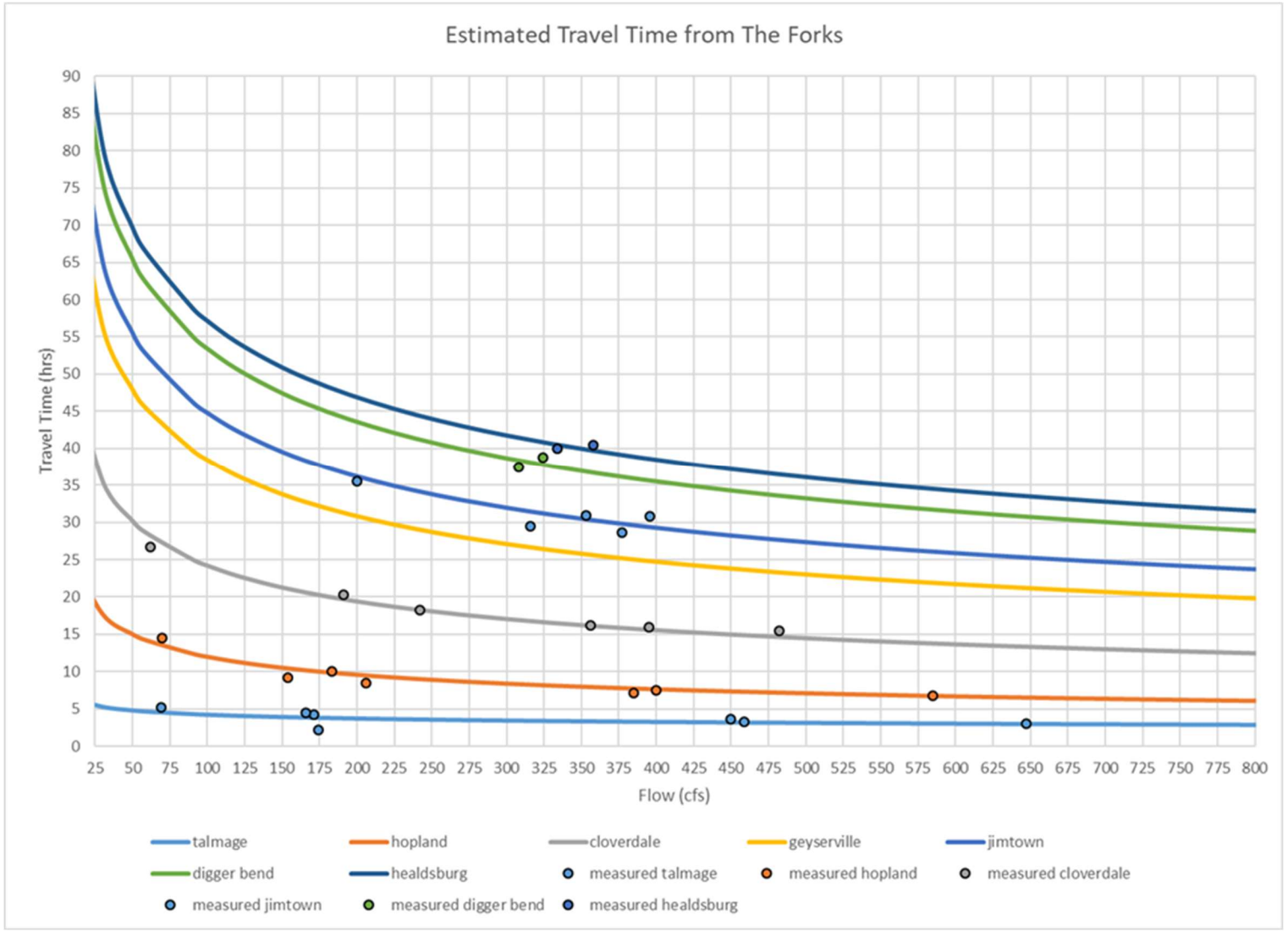
- Water Accounting for the Upper Russian River is an analysis that approximates the current conditions based on methodology in Term 11 (2/11/21 Order) report and modified by Term 12 (6/14/21 Order) report. Values listed include estimated values where measurements are not currently available (red italics).

Attachment 1 – Example Weekly Accounting Report: Lake Sonoma – Dry Creek - Lower Russian

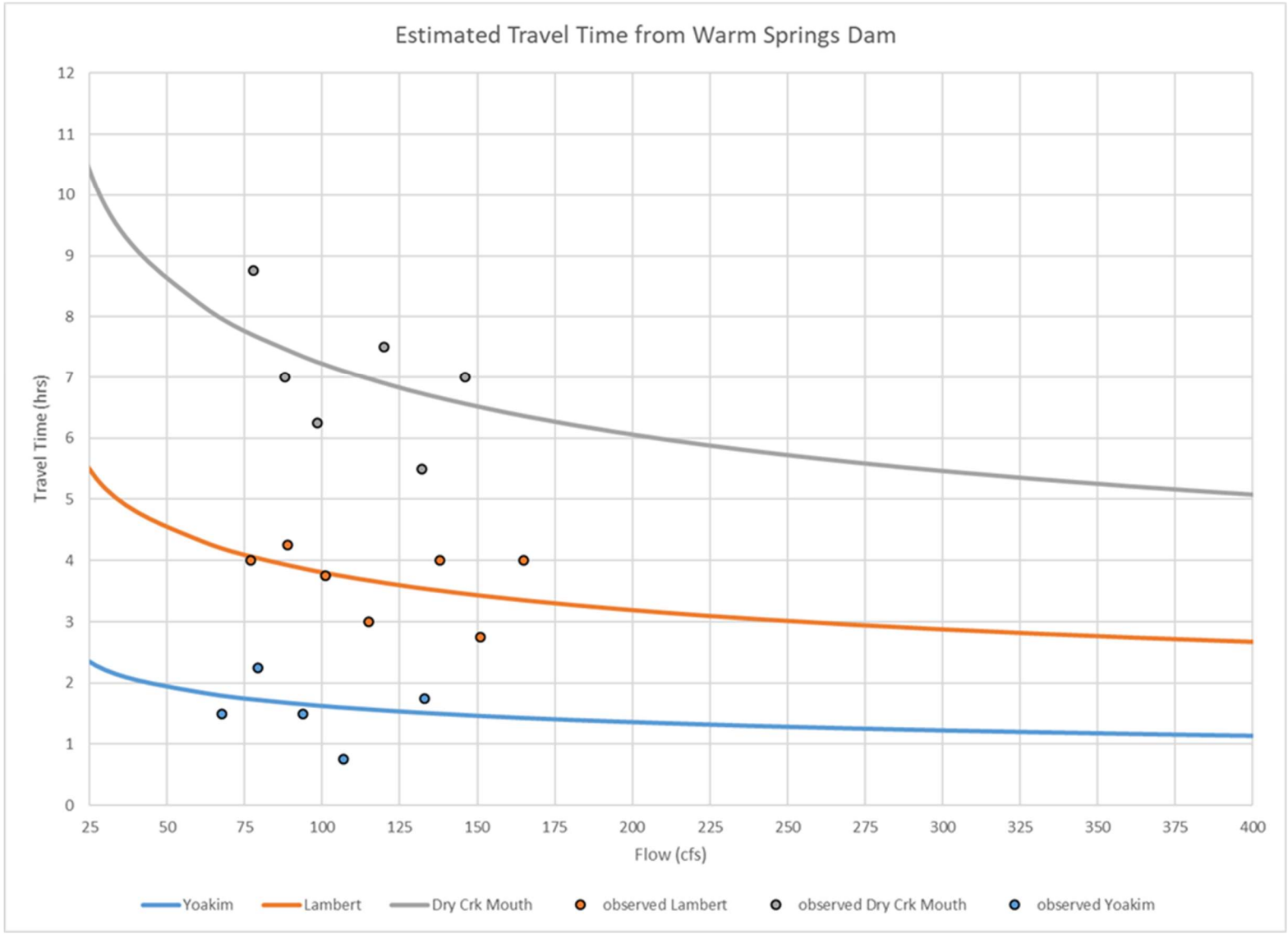
			7/9/2021	7/10/2021	7/11/2021	7/12/2021	7/13/2021	7/14/2021	7/15/2021
IV. Lake Sonoma									
Lake Sonoma									
Storage Change (ac-ft)			-273.0	-255.0	-255.0	-221.0	-203.0	-255.0	-338.0
(cfs)			-138	-129	-129	-111	-102	-129	-170
Evaporation (ac-ft)			26.8	27.9	25.7	25.7	24.6	24.5	24.5
Inflow (Natural Flow)			0	0	0	6	14	0	0
WSD Release Gage			102	101	101	104	104	103	93
Storage (Project Water)			102	101	101	98	90	103	93
Natural Flow			0	0	0	6	14	0	0
V. Lower Dry Creek Reach									
Minimum Instream Flow Requirement			25	25	25	25	25	25	25
Controlling Compliance Gage									
Min Gage Flow			87	88	89	90	92	93	92
Controlling Gage			Dry Crk Mouth	Dry Crk Mouth	Dry Crk Mouth	Dry Crk Mouth	Dry Crk Mouth	Dry Crk Mouth	Dry Crk Mouth
All Compliance Gages		*Crk mi.*							
WSD Release		*14.3*	102	101	101	104	104	103	93
Yoakim	(USGS 11465200)	*11.1*	108	108	109	111	112	111	108
Lambert	(USGS 11465240)	*6.8*	110	110	111	113	115	115	113
Dry Crk Mouth	(USGS 11465350)	*0.1*	87	88	89	90	92	93	92
WSD to Russian River Confluence Reach Analysis									
Total Pass-through Water			0	0	0	6	14	0	0
Net Reach Loss(-)/Gain(+)									
WSD - Yoakim			+7	+7	+8	+7	+8	+8	+7
Yoakim - Lambert			+2	+3	+3	+2	+3	+4	+4
Lambert - Dry Crk Mouth			-22	-22	-22	-22	-23	-22	-22
WSD - Dry Crk Mouth			-14	-13	-11	-13	-12	-10	-11
WSD Project Water Release to Meet Min Flow Requirement									
Net Reach Loss/Gain to Controlling Gage			-14	-13	-11	-7	+2	-10	-11
Project Water Release Required			Yes	Yes	Yes	Yes	Yes	Yes	Yes
VI. Russian River - Dry Creek Confluence									
Upper Russian River Flow (Healdsburg Gage)									
L. Mendocino Project Water + Import Water			28	25	24	25	25	26	26
Natural Flow			0	0	0	0	0	0	0
Dry Creek Flow (Mouth Gage)									
L. Sonoma Project Water			87	88	89	90	91	93	92
Natural Flow			0	0	0	0	2	0	0
Russian River d/s of Confluence Flow			116	113	113	115	117	118	118
L. Mendocino Project Water + Import Water			28	25	24	25	25	26	26
L. Sonoma Project Water			87	88	89	90	91	93	92
Natural Flow			0	0	0	0	2	0	0
VII. Lower Russian River Reach									
Minimum Instream Flow Requirement			35	35	35	35	35	35	35
Controlling Compliance Gage									
Min Gage Flow			47	43	43	43	43	46	47
Controlling Gage			Hacienda	Hacienda	Hacienda	Hacienda	Hacienda	Hacienda	Hacienda
All Compliance Gages		*Rvr mi.*							
Windsor	(USGS 11463390)	*26.6*	119	117	117	117	118	119	119
Hacienda	(USGS 11467000)	*21.8*	47	43	43	43	43	46	47
Confluence to Windsor Reach Analysis									
Net Reach Loss/Gain to Windsor Gage			+3	+4	+3	+2	+1	+1	+1
L. Mendocino Project Water + Import Water			18	15	14	15	16	15	16
L. Sonoma Project Water			87	88	89	90	91	93	92
Natural Flow			14	14	13	12	12	11	11
Confluence to SCWA Wohler Production Facility Reach Analysis									
Approx. Flow u/s of Wohler			126	112	110	121	109	111	113
Net Reach Loss(-)/Gain(+)			+10	-2	-3	+6	-8	-7	-5
L. Mendocino Project Water + Import Water			28	23	21	25	19	19	21
L. Sonoma Project Water			87	88	89	90	91	93	92
Natural Flow			10	0	0	6	0	0	0
Confluence to Hacienda (Guerneville) Reach Analysis									
Net Reach Loss(-)/Gain(+)			-69	-71	-70	-72	-74	-72	-71
L. Mendocino Project Water + Import Water			0	0	0	0	0	0	0
L. Sonoma Project Water			37	43	43	37	43	46	47
Natural Flow			10	0	0	6	0	0	0
VIII. Water Production under Sonoma Water Water Rights (ac-ft)									
Lower Russian River									
Sonoma Water Total			156.5	136.4	132.7	154.4	131.3	130.4	130.4
	Wohler		69.0	54.9	75.1	66.9	45.2	45.0	46.3
	Mirabel		87.4	81.5	57.6	87.5	86.1	85.4	84.2
Town of Windsor River Wellfield			10.8	10.2	9.8	10.3	9.6	10.1	9.8
Camp Meeker & Occidental			*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
Upper Russian River									
City of Healdsburg									
	Gauntlett & Fitch Mtn		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dry Creek									
City of Healdsburg									
	Dry Creek Wellfield		2.3	1.7	2.3	2.5	2.7	2.7	2.6

Notes:
- Water Accounting for the Lower Russian River and Dry Creek is an analysis that approximates the current conditions based on the methodology in Term 12 (6/14/21 Order) report. Values listed include estimated values where measurements are not currently available (red italics).

Attachment 2 – Travel time estimates as a function of stream discharge for the Upper Russian River



Attachment 3 – Travel time estimates as a function of stream discharge for Dry Creek



Attachment 4 – Travel time estimates as a function of stream discharge for the Lower Russian River