



**Sonoma  
Water**

**VIA EMAIL**

April 1, 2021

Attn: Mr. Erik Ekdahl  
Deputy Director of Water Rights  
State Water Resources Control Board  
Division of Water Rights  
P.O. Box 2000  
Sacramento, CA 95812-2000

**Re: Reporting Requirements for Term 10 of the State Water Resources Control Board Order Dated February 4, 2021 (Amended February 11, 2021)**

Dear Mr. Ekdahl:

In accordance with the requirements of the State Water Resources Control Board Order 2020-0102-EXEC received July 28, 2021 that approved the Temporary Urgency Change Petitions for water-right Permit 12947A (Applications 12919A), please accept the submittal of the following enclosed report by Sonoma Water:

- Term 10 – Upper Russian River Operations and Water Use Forecasts

If you have any questions about these reports, please do not hesitate to contact me at [tschram@scwa.ca.gov](mailto:tschram@scwa.ca.gov).

Sincerely,

A handwritten signature in blue ink, appearing to read "Todd Schram".

Todd J. Schram, P.E.  
Water Agency Engineer IV

Enclosures

c: S. Boland-Brien - State Water Resources Control Board, Division of Water Rights  
G. Davis, J. Jasperse, P. Jeane, D. Seymour - Sonoma Water  
C. O'Donnell, A. Brand - Sonoma County Counsel  
R. Bezerra - Bartkiewicz, Kronick & Shanahan  
E. Salomone – Mendocino County Russian River FCWCID

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State Water Resources Control Board  
Order Dated February 4, 2021  
(Amended February 11, 2021)

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Term 10

Upper Russian River Operations and Water  
Use Forecasts



**April 1, 2021**

Prepared by

**Sonoma County Water Agency  
404 Aviation Blvd  
Santa Rosa, CA 95403**

## 1 Introduction

The Sonoma County Water Agency (Sonoma Water) submitted a temporary urgency change petition on January 7, 2021 for modifications to water right Permit 12947A that would implement an alternative hydrologic index to establish minimum instream flow requirements in the Upper Russian River (upstream of the Dry Creek confluence). On February 4, 2021, the State Water Resources Control Board (SWRCB) Order was issued approving Sonoma Water's petition. On February 11, 2021, the SWRCB issued an amended order (Order). This report documents Sonoma Water's response to the requirements of Term 10, which was unchanged under the Order.

The completion of the requirements under Term 10 were contingent on the water supply conditions status on March 1<sup>st</sup> as determined by the alternative hydrologic index (found in Term 1 of the Order). Because Term 1 established a 'Critically Dry' water supply condition on March 1<sup>st</sup> for the Upper Russian River, the following requirements of Term 10 are to be submitted by April 1, 2021:

'...to facilitate releases of Lake Mendocino stored water with minimal operational buffers, Sonoma Water shall provide to the Deputy Director recommendations on what additional diversion information from other water users in the watershed may support improved real-time demand forecasts and reduced operational buffers for Lake Mendocino. Sonoma Water shall coordinate with the Mendocino County Russian River Flood Control on developing recommendations...'

## 2 Lake Mendocino Operations

Sonoma Water is the local sponsor for Lake Mendocino, 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 Coyote Valley Dam at Lake Mendocino to maintain the minimum instream flow requirements specified in its water right permits and for downstream beneficial uses along the Russian River, including diversions for domestic, municipal, industrial and agricultural purposes. These releases are made by Sonoma Water when reservoir storage levels are in the water supply pool as determined by the reservoir guide curve, a seasonally-variable water surface elevation documented in the facility's Water Control Manual.

Sonoma Water and the Mendocino County Russian River Flood Control and Water Conservation Improvement District (Mendocino District) each have a water right that authorizes storage of water in Lake Mendocino's water supply pool, rediversion of storage releases downstream, and direct diversion of Russian River water.

Sonoma Water makes release decisions on the Upper Russian River to comply with minimum instream flow requirements in its water right permits at compliance locations as far away as Healdsburg, over 60 miles downstream of Lake Mendocino. While Sonoma Water must release enough water to satisfy

diversions and stream depletions that occur along the river as well as achieve compliance with the minimum instream flow requirements, it does not control nor have operational schedules for any of these diversions. The magnitude of diversions and depletions are estimated from net streamflow loss calculated from stream gage information at the compliance locations and fluctuate as there is no coordination of diversions within the watershed. Streamflow depletions represent losses due to diversions (direct or via groundwater wells) and other processes such as evapotranspiration and surface-groundwater exchange.

Sonoma Water only has discretion to make reservoir releases to meet instream flows and very little real-time information regarding downstream diversions and other losses, nor authority or control over such diversion and losses. Consequently, Sonoma Water must make release decisions to account for this uncertainty in actual diversions and depletions across the river reaches down to the confluence with Dry Creek by incorporating an operational buffer flow into its calculation for required reservoir releases. This buffer flow is meant to maintain minimum instream flow compliance even if sudden increases in reach losses occur. When such increases are observed, operations staff at Sonoma Water must determine whether the situation requires a change in reservoir releases. This situation is complicated by the time lag between reservoir releases and potential downstream changes in diversions. In general, Sonoma Water bears a risk of not achieving minimum in-stream flows due to rapidly fluctuating downstream diversions it neither controls nor has sufficient information about timing, magnitude and location. This risk of non-compliance leads to the necessity of a greater operational buffer.

### 3 Minimum Instream Flow Requirements

The minimum instream flow requirements for the Upper Russian River downstream of Lake Mendocino are divided into two regulatory reaches. Lake Mendocino lies on the East Fork of the Russian River and the region downstream has a year-round minimum instream flow requirement of 25 cubic feet per second (cfs). The East Fork confluence with the West Fork lies approximately one mile downstream of Coyote Valley Dam. From this point, referred to as The Forks, to the Russian River's confluence with Dry Creek, the minimum instream flow requirements range from 25 cfs under critical conditions to 185 cfs under normal conditions in the spring and summer. Since the National Marine Fisheries Service's issuance of the 2009 Russian River Biological Opinion, summertime minimum instream flow requirements have been reduced to 125 cfs through multiple temporary urgency change orders due to the harm higher flows pose to threatened and endangered salmonids.

During the wet weather season that spans from late fall through spring, natural streamflows are often sufficiently high enough that additional reservoir releases are not needed to meet the minimum instream flow requirements on the mainstem downstream of The Forks. Based on a review of operational data from 2013-2019, this condition spanned more than 90% of the wet weather season (see Table 1). For the remainder of the year, Sonoma Water is most often making reservoir releases to satisfy the minimum instream flow requirements downstream of The Forks. Based on the 2013-2019 operational data, this was the case 74% of the dry season. During dry years, however, Sonoma Water may be making significant reservoir releases to satisfy the minimum instream flow requirements throughout the whole year.

**Table 1. Percentage of Time that Lake Mendocino Releases Set by Minimum Instream Flow Requirements Compliance Gages (2013-2019)**

|            | Streamflow Locations (river mile) |                   |                      |                      |
|------------|-----------------------------------|-------------------|----------------------|----------------------|
|            | The Forks<br>(99.0)               | Hopland<br>(84.8) | Cloverdale<br>(70.9) | Healdsburg<br>(35.6) |
| Dry Season | 9.4%                              | 9.7%              | 2.7%                 | 61.5%                |
| Wet Season | 35.0%                             | 5.0%              | 1.6%                 | 1.8%                 |

*Note: Coyote Valley Dam lies on the East Fork 1.0 mile upstream of The Forks.*

## 4 Operational Buffer Analysis

The amount of the operational buffer maintained by Sonoma Water operations staff ranges based on hydrologic conditions, the designated minimum instream flow requirement, and the distance downstream that the controlling compliance stream gage is from Lake Mendocino. During dry years, when Lake Mendocino does not have adequate storage, reducing the operational buffer can provide a moderate water supply benefit to Lake Mendocino storage.

In a number of recent orders issued by the SWRCB approving temporary urgency change petitions filed by Sonoma Water, the SWRCB has approved using a five-day running average of average daily flows to comply with minimum instream flow requirements. Based on recent analysis by Sonoma Water engineering staff, this can reduce the operational buffer by at least 25 percent. Table 2 shows the average operational buffers for operating to The Forks and Healdsburg under a 75-cfs minimum instream flow requirement.

**Table 2. Average Operational Buffers (cfs) Under Minimum Instream Flow Requirement of 75 cfs for Alternate Compliance Criteria (2013-2019)**

|                       | The Forks | Healdsburg |
|-----------------------|-----------|------------|
| Instantaneous         | 12.8      | 15.8       |
| 5-day Running Average | 13.1      | 11.7       |

## 5 Recommendations

Sonoma Water has implemented a program of developing real-time diversion forecast reports for the Upper Russian River on several occasions as a part of the terms under temporary urgency change orders (TUCO). The most recent implementation was under Term 11 of the 2020 TUCO, but the original development of a diversion forecast reporting tool dates back to 2014. Under Term 1 of the Mendocino

District's 2014 TUCO (dated August 25, 2014), Sonoma Water provided coordination and developed the tools and protocols for a 3-day diversion forecast based on submittals of planned diversions by the Mendocino District's customers. The requirements for implementing a diversion forecast reporting in the Upper Russian River was subsequently also included in Sonoma Water TUCOs in 2015 (Term 19) and 2016 (Term 12). Sonoma Water used a similar approach under each TUCO that was based on Mendocino District customers submitting hourly diversion forecasts via an online reporting form from a desktop or mobile device. These diversion forecast submittals were aggregated to produce a daily diversion forecast report provided to Sonoma Water operations staff. The report provided hourly diversion forecasts over the upcoming 72 hours for the three reaches of the Upper Russian River—Talmage, Hopland, and Cloverdale—and Lake Mendocino. The amount of diversion forecast data collected under the program fell short on achieving a level of participation upon which any meaningful interpretations could be realized.

The experience with implementing diversion forecast reporting has helped inform an understanding of the limitations of an approach that relies on additional reporting requirements by river diverters. Sonoma Water believes that there may be a better approach to forecasting river conditions than individual diversion schedule submittals, which are subject to change and a challenge to manage.

Sonoma Water has considered various alternatives and developed the following recommendations to achieve improved efficiencies in utilizing Lake Mendocino releases to meet authorized downstream beneficial uses.

List of Recommendations:

- I. The implementation of a five-day running average flow criteria for compliance with the minimum instream flow requirements on the Russian River has occurred temporarily eight times since 2011 under orders issued on Sonoma Water's temporary urgency change petitions. Due to the implicit reactive nature under which Sonoma Water must operate the Russian River, a compliance criteria of a five-day running average provides Sonoma Water additional time and flexibility in the decision-making process of setting reservoir releases to meet flow changes observed downstream with travel times of up to several days. This change would result in a lower operational buffer. Sonoma Water recommends that a five-day running average compliance criteria be implemented for the minimum instream flow requirements specified in its water rights permits for water supply conditions other than 'Critical' with new additional minimum instantaneous limits equivalent to 10 cfs less than the minimum instream flow requirements.
- II. Since 2017, the monitoring and reporting requirements implemented under Senate Bill 88 provide a valuable dataset to characterize and better understand the dynamics in the Russian River watershed. Sonoma Water estimates that these regulations apply to nearly 1,000 water rights in the watershed with over 200 rights required to submit daily production data at each point of diversion in their annual water rights reports. These data have provided a higher quality record of diversions at more relevant time intervals for larger water rights from which improved planning and operational tools can be developed. Sonoma Water recommends that the SWRCB continue

its efforts in auditing annual report submittals and achieving higher compliance rates over the coming years.

- III. Operations of Lake Mendocino by Sonoma Water are best described as a reactive approach. Understanding the authorized diversions and water rights in the Russian River watershed is a complex matter with multiple sources of water present in the system (primarily natural flow, imported water, and reservoir storage releases) and water right-holders with multiple overlapping rights that provide access to certain 'types' of water. Additional complications are found in distinguishing surface water use of underflow from groundwater pumping and the quantification of natural streamflow present and available underground for surface water diversions. The SWRCB has published basic information about water rights on its website via the eWRIMS water rights database tools and queries. To interpret diversions and observations in the watershed a more comprehensive understanding of the watershed water rights is necessary, which would include establishing the relationships that exist across water rights and how water rights-holders use multiple rights to satisfy demands, updating outdated Place of Use mapping to establish reliably where diversions are beneficially used, and confirming the relationships of Points of Diversion locations with places of use. Sonoma Water recommends that the SWRCB continue to improve and modernize its documentation of water rights such that a more comprehensive understanding can be developed of water use in the Russian River.
- IV. While the initial iterations of a diversion forecast program haven't been successful in providing operational guidance to reduce operational buffer flows, Sonoma Water does believe that such a program could be a valuable operations tool to assist in Lake Mendocino release decisions. The Russian River watershed has 27 stream gages with 14 on the mainstem of the Russian River and Dry Creek that provide real-time access to streamflows. Other than the diversions that occur by Sonoma Water, there is no other real-time access to quantify large diversions on the Russian River. In place of water right-holders submitting scheduled diversions over the next several days, Sonoma Water sees potential in the development of a short-term diversion forecast model based on current hydrologic conditions, forecasted meteorology and real-time diversion data. Sonoma Water recommends that a study be conducted to evaluate the feasibility of a real-time diversion forecast tool based on access to real-time diversion telemetry and comprehensive data analytics. Such an endeavor would necessitate regional partners and the support of state government agencies, such as SWRCB and California Department of Water Resources. This work could leverage ongoing projects and partnerships that Sonoma Water has supported, such as the Russian River GSFLOW - MODSIM model development work that is ongoing in collaboration with the SWRCB and the U.S. Geological Survey.