

WR-2 HYDROLOGY STUDY PLAN

**KERN RIVER No. 3 HYDROELECTRIC PROJECT
*FERC PROJECT No. 2290***

PREPARED FOR:



July 2022

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1.0 POTENTIAL RESOURCE ISSUE

- Potential effects of Kern River No. 3 (KR3) Hydroelectric Project (Project) operations on stream hydrology.

2.0 PROJECT NEXUS AND HOW THE RESULTS WILL BE USED

- Project operations influence streamflow along the bypassed reaches downstream of the Fairview Dam on the North Fork Kern River (NFKR) and below the small diversions on Salmon and Corral Creeks.
- Hydrologic gage data collected and verified in this study will be used to analyze environmental effects of Southern California Edison (SCE) Company's relicensing proposal and reasonable alternatives.

3.0 STUDY GOALS AND OBJECTIVES

- Compile and summarize hydrologic gage data for use in other resource assessments.
- Determine, compile, and summarize natural functional flow ranges in wet, moderate, and dry years using existing unimpaired data.

4.0 STUDY AREA AND STUDY SITES

The study will compile data from:

- SCE Gage 401 (U.S. Geological Survey [USGS] gage 11186000) in the NKFR downstream from Fairview Dam;
- SCE Gage 402 (USGS gage 11185500) in the conveyance flowline at Adit 6/7; and
- U.S. Army Corps of Engineers (USACE) gage in Kernville.

5.0 EXISTING INFORMATION

SCE currently maintains two gaging stations to monitor and record flows associated with Project operation. The gages record flow in NFKR below Fairview Dam and within the KR3 conveyance flowline. These gages are operated with independent review by USGS. Depending on the period of record required, this data might be available electronically, on floppy disk, or on paper.

USACE operates a streamflow gage at Kernville. This data is subject to USACE oversight and to a different standard than the USGS gages upstream. A brief discussion of equipment error and reporting standards will be included in a Technical Memo (see Section 7.0, Reporting, below).

6.0 STUDY APPROACH

This is a desktop analysis, with the below tasks anticipated.

- Compile hydrology data from SCE, USGS, and/or USACE for the current license term from water year 1997 through 2021.
 - Daily mean gage data will be compiled from SCE and/or USGS for the period October 1, 1996, to September 30, 2004, due to technological data storage limitations in the early portion of the current license period.
 - Hourly gage data will be compiled from SCE, USGS, and/or USACE for the remainder of the current license period (i.e., water year 2005 beginning October 1, 2004, through water year 2021 ending September 30, 2021).
- Hourly gage data from water years 2022 and 2023 will be compiled from SCE and USGS after the water year is complete to support other studies, but not included with other statistical analyses described below.
- Gage data will be verified through a quality assurance (QA) process at the hourly or daily level. This QA process includes compiling and then aggregating data from various sources into a comprehensive data set, identifying data gaps, and validating data consistency.
- Gage data will be compiled and summarized using various statistical parameters for use in resource evaluations, including:
 - Maximum/minimum, average/median, and variance summarized annually, seasonally, and/or monthly; and
 - Flow duration curves and flow exceedance probabilities summarized annually and/or monthly.
- In order to calculate flow travel times along the NFKR between Fairview Dam and Kernville, existing and available flow data from both the SCE flow gage below Fairview Dam and the USACE flow gage at Kernville will be analyzed to detect changes in flow fluctuations. Flow travel times will be estimated (on an hourly level) as depicted from the shifts in flow recorded between the two gages.
- Calculate natural functional flow ranges for the NFKR upstream of Fairview Dam in wet, moderate, and dry years with existing gage data, consistent with Section A of the California Environmental Flows Framework (CEFF) (CEFWG 2021; Stein et al. 2021).

Because this Project operates as run-of-river, hydrologic modeling is not included in this study.

7.0 REPORTING

SCE will file an Initial Study Report (ISR) within 1 year following FERC’s Study Plan Determination (estimated August 3, 2023) and an Updated Study Report (USR) no later than 2 years after FERC’s Study Plan Determination. The ISR and USR will provide an update on SCE’s overall progress in implementing the Study Plan and schedule and the data collected, including an explanation of any variance from the Study Plan and schedule. A Technical Memo will be appended to either the ISR or USR filing, as applicable. The information provided in the Technical Memo will be summarized in, and appended to, the Application for New License.

In addition, SCE may prepare interim reports during the study year to apprise Stakeholders on study implementation progress and to support consultation with Stakeholders. Additionally, raw hydrology data through water year 2021 will be provided to Stakeholders after the data are compiled, tabulated, and checked for quality and prior to issuance of the application. The data from water years 2022 and 2023 will also be provided (anticipated by the beginning of the following year), after the annual data review process.

8.0 SCHEDULE

Date	Activity
Summer–Fall 2022	Compile gage data from USGS/SCE for the established period of record; Review and analyze data for integrity, consistency, and data gaps
August 2023	Complete hydraulic analyses and provide hydrologic gage data and Technical Memo with ISR

ISR = Initial Study Report; SCE = Southern California Edison Company; USGS = U.S. Geological Survey

9.0 LEVEL OF EFFORT AND COST

The estimated cost (2022 dollars) for this study is \$70,000, which includes data compilation and analysis, and reporting.

10.0 REFERENCES

CEFWG (California Environmental Flows Working Group). 2021. *California Environmental Flows Framework Version 1.0*. California Water Quality Monitoring Council Technical Report.

Stein, E.D., J. Zimmerman, S.M. Yarnell, B. Stanford, B. Lane, K.T. Taniguchi-Quan, A. Obester, T.E. Grantham, R.A. Lusardi, and S. Sandoval-Solis. 2021. *The California Environmental Flows Framework: Meeting the Challenges of Developing a Large-Scale Environmental Flows Program*. Frontiers in Environmental Science.

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