

# **GEO-1 EROSION AND SEDIMENTATION STUDY PLAN**

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

***PREPARED FOR:***



July 2022

Page Intentionally Left Blank

## **1.0 POTENTIAL RESOURCE ISSUE**

- Kern River No. 3 Hydroelectric Project (Project) routine operation and maintenance (O&M) activities have the potential to contribute to erosion and sediment delivery to adjacent drainages.

## **2.0 PROJECT NEXUS AND HOW THE RESULTS WILL BE USED**

- Routine Project O&M activities have the potential to increase erosion and sediment delivery to nearby drainages. Runoff from hard surfaces such as roads and structures can cause surface erosion and potentially contribute to mass wasting. Refer to Study Plan *LAND-1, Road Condition Assessment*, regarding an evaluation of Project and Shared Access Roads that are used to access Project facilities to conduct O&M activities. Eroded soil and debris can affect water quality (e.g., turbidity), stream channel geomorphology, and aquatic habitats if delivered directly to waterbodies or stream channels. The use of Project dam spillways and dam outlet release facilities can cause erosion in the area near the point of discharge, resulting in potential effects to the downstream stream channel and aquatic habitats.
- Additional data are needed to characterize the potential for increased erosion at Project facilities due to routine O&M activities.

## **3.0 STUDY GOALS AND OBJECTIVES**

This study will include a reconnaissance level inventory and assessment of erosion and sedimentation to identify the extent to which Project facilities—including structures—are contributing to erosion. This study will inform the assessment of potential effects of erosion and sedimentation caused by Project operations and/or runoff from Project-related facilities and/or other hard surfaces.

## **4.0 STUDY AREA AND STUDY SITES**

The study area includes Project facilities and features. A road assessment, including documentation of road-side erosion, is addressed in Study Plan *LAND-1, Road Condition Assessment*. Specific study sites include:

- Project spillways, including Kern River No. 3 Powerhouse Spillway and Cannell Creek Siphon Spillway.
- Project diversions, including Fairview Dam, Salmon Creek Diversion, and Corral Creek Diversion.
- Uncovered Conveyance Flowline flume segments.
- Project-related buildings and parking areas, including the KR3 Powerhouse.
- Project spoil piles.

## **5.0 EXISTING INFORMATION**

The Kern River No. 3 Pre-Application Document (July 2021) reviewed existing, relevant, and reasonably available information associated with erosion in the Project Area. As there are no major proposed changes to the existing Project, sources of erosion and sedimentation include routine activities associated with maintenance (e.g., dam and diversion structures, the water conveyance system, and buildings), minor improvements (e.g., removing accumulated sediment/large debris from the diversion pools), and operation of the existing Project (e.g., spillways and other release locations).

Previous assessments identified the potential for erosion associated with the spill channel located between the KR3 Powerhouse forebay structure and the North Fork Kern River. Southern California Edison Company (SCE) stabilized the section by placing riprap along 200 to 300 feet of the spill channel (FERC, 1996). SCE also developed a comprehensive erosion control plan in 1997 in response to License Article 401 and Forest Service Condition 7 (SCE, 1997). The plan includes application of erosion-control structures as protective measures against erosion, including structures such as riprap and rock in areas prone to significant flows and in areas prone to erosion.

## **6.0 STUDY APPROACH**

The study methods will consist of the following three tasks:

### **Task 1: Desktop Review**

Conduct an initial review of maps, geological and soils data, construction O&M records, and interviews with maintenance personnel to provide information about the locations, causes, and relative severity of past erosion, as well as potential sediment delivery to streams and reservoirs.

### **Task 2: Geomorphic Interpretation**

Topographic maps, historical aerial photographs, 2020 UAV imagery and videos, and any available LiDAR data will be reviewed to provide the geomorphic context for the Project Area and identify areas of past and active erosion in the vicinity of Project structures and roads.

### **Task 3: Field Surveys**

Field surveys will be performed to document erosion from Project-related sources and the potential for sediment delivery to streams. Field methods will be adapted from relevant guidance documents regarding erosion inventory and sediment control in California and the Pacific Northwest (CDFG, 2010; USFS, 2012; Weaver et al., 2014). Documentation of erosion condition at sites will include: (1) location of site mapped using submeter global navigation satellite system (GNSS), (2) photo documentation, (3) description of erosion processes, (4) estimate volume of eroded material and delivery potential, (5) estimate historic erosion rates and potential future erosion. Erosion volumes will be visually

estimated or recorded with measurements of average dimension (length, width, depth) where appropriate.

#### Task 4: Analysis

An assessment of erosion and sediment delivery potential will be made for each site based on data collected during Task 3. Sediment delivery volumes will be estimated, and future erosion potential will be categorized based on the potential for sediment delivery to streams or reservoirs. Slopes and soil types identified as potentially unstable will be included, as appropriate. A geographic information system (GIS) map will be prepared to show the locations of all features identified during the inventory.

### 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. Standard GIS shapefiles, including metadata, will be provided to relevant agencies upon request. 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.

### 8.0 SCHEDULE

Date	Activity
Spring 2023	Conduct Tasks 1–3: Desktop Review, Geomorphic Interpretation, and Field Surveys
Summer 2023	Analyze data and prepare Technical Memo
August 2023	Provide Technical Memo with ISR

ISR = Initial Study Report

### 9.0 LEVEL OF EFFORT AND COST

The estimated cost (2022 dollars) for the study is \$52,000, which includes study-specific consultation, field work, data compilation and analysis, and reporting.

## 10.0 REFERENCES

- CDFG (California Department of Fish and Game). 2010. *California salmonid stream habitat restoration manual*. Fourth edition. Wildlife and Fisheries Division.
- FERC (Federal Energy Regulatory Commission). 1996. *Environmental Assessment for Hydropower License*. Kern River No. 3 Hydroelectric Project. FERC Project No. 2290.
- SCE (Southern California Edison). 1997. *Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust*. Kern River No. 3 Hydroelectric Project FERC No. 2290.
- USFS (U.S. Forest Service). 2012. "National Best Management Practices for Water Quality Management on National Forest System Lands (FS-990a)." Volume 1: *National Core BMP Technical Guide*. April 2012. Available at: [https://www.fs.fed.us/biology/resources/pubs/watershed/FS\\_National\\_Core\\_BMPs\\_April2012.pdf](https://www.fs.fed.us/biology/resources/pubs/watershed/FS_National_Core_BMPs_April2012.pdf).
- Weaver, W., E. Weppner, and D. Hagens. 2015. *Handbook for Forest, Ranch, and Rural Roads*. Prepared for the Mendocino County Resource Conservation District.