
DRAFT
LAND 2 – EROSION AND SEDIMENTATION
TECHNICAL STUDY PLAN

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930



May 2023

TECHNICAL STUDY PLAN

LAND 2 – Erosion and Sedimentation

POTENTIAL RESOURCE ISSUES

- Erosion and sedimentation associated with operation and maintenance (O&M) of the Project.

PROJECT NEXUS

- Routine Project O&M activities have the potential to increase erosion and sediment delivery to nearby drainages. Runoff from hard surfaces such as Project roads, trails, and facilities have the potential to increase surface erosion.

RELEVANT INFORMATION

The following information is available regarding erosion and sedimentation in the vicinity of the Project. See the Pre-Application Document (PAD) Section 3.4, Water Quality and Section 3.8, Geomorphology for a summary of relevant information:

- National Best Management Practices for Water Quality Management on National Forest System Lands (FS-990a). Volume 1: National Core BMP Technical Guide (Forest Service 2012)
- Final Environmental Assessment for Hydropower License, Kern River No. 1 Hydroelectric Project, FERC Project No. 1930-014 (FERC 1998)
- Application for New License for the Kern River No. 1 Hydroelectric Project (SCE 1994)
- Incident Report of Landslide Initiated Forebay Spill Kern River No. 1 Project – FERC Project No. 1930 (SCE 2013)
- Sediment Monitoring Results and Sediment Management Plan (SCE 1999)
- Kern River No. 3 Pre-Application Document, FERC Project No. 2290 (SCE 2021)
- Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust. Kern River No. 3 Hydroelectric Project FERC No. 2290 (SCE 1997)

POTENTIAL INFORMATION GAPS

- Updated information on Project-related sources of sediment and erosion.

STUDY OBJECTIVES

- Identify historical and existing sources of sediment adjacent to the bypass reach, Democrat Dam Impoundment, water conveyance system, and other Project facilities, including major gullies; areas of vegetation and/or soil loss; hillslope destabilization; and mass wasting.
- Document erosion and sedimentation associated with SCE's ongoing O&M activities.
- Document natural sources of sediment unrelated to the Project.

EXTENT OF STUDY AREA

- The study area for erosion and sedimentation includes the bypass reach, Democrat Dam Impoundment, water conveyance system, and other Project facilities listed in PAD Table 2-1. Underground and underwater Project facilities will not be evaluated.
- Studies will not be conducted at locations where access is unsafe (e.g., where there is very steep terrain) or on private property for which SCE has not received specific approval from the landowner to enter the property to perform the study.

STUDY APPROACH

The approach for identifying historical and existing sediment sources and Project-related erosion areas is described below.

IDENTIFY HISTORIC AND EXISTING SOURCES OF SEDIMENT AND PROJECT-RELATED EROSION AREAS

- Document the location and relative volume of historic and existing sediment recruitment to stream channels.
 - Significant sediment recruitment, mass wasting, and/or bank erosion sites will be mapped via aerial reconnaissance, ground survey, and/or aerial photography.
 - Identify whether the sources of sediment are derived from natural watershed process or Project-related effects.
 - Generalize whether sediment sources are actively or inactively contributing sediment and if so by how much (e.g., low, moderate, high delivery potential to the stream channel).
 - Review the August 19, 2013, storm event causing a landslide and subsequent Forebay spill. Highway 178 was closed due to multiple slides blocking the roadway (SCE 2013). See Section 3.7, Geology and Soils of the PAD for additional information.

- Review winter storm cycles of 2022-2023, which have caused debris slides in the Project area/canyon closing Highway 178.
- Historic and/or ongoing erosion at the Project facilities (including Project reservoirs) will be mapped via aerial reconnaissance, ground survey, and/or aerial photography.

REPORTING

- Study methods and results will be documented in a LAND 2 – Erosion and Sedimentation Technical Study Report (TSR). The TSR will include summary tables and maps, as appropriate. Stakeholder review and comment period for the TSR is identified below in the Schedule.
- Upon request, data will be provided to resource agencies and interested stakeholders in an Excel spreadsheet (electronic format).

SCHEDULE

This is a one-year study to be conducted during the first year of the study period with the study results reported in the Initial Study Report (ISR).

Date	Activity
April 2024–August 2024	Initiate desktop review and field surveys
September 2024–December 2024	Analyze data and prepare draft technical memo
January 2025	Distribute draft technical memo to stakeholders
February 2025–April 2025	Stakeholders review and provide comments on draft technical memo (90 days)
May 2025–June 2025	Resolve comments and prepare final technical memo
December 2025	Distribute final technical memo in Draft License Application

REFERENCES

SCE (Southern California Edison). 2013. Incident Report of Landslide Initiated Forebay Spill Kern River No. 1 Project – FERC Project No. 1930. September 10, 2013.

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TABLES

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Table 1-1. Project Facilities

Diversion Dam
Democrat Dam
Impoundment
Democrat Dam Impoundment
Water Conveyance System
Sandbox
Tunnels
Flumes, Conduits, and Adits
Forebay
Forebay Overflow Spillway
Penstock
Powerhouse and Switchyard
Kern River No. 1 Powerhouse and Switchyard
Access Roads
Willow Spring Creek Road (also referred to as Democrat Dam Road)
Powerline Road
Flume No. 1 Road
Dougherty Creek Road
Stark Creek Road
Forebay Operations Area Road
Lower Powerhouse Road
Upper Powerhouse Road
Access Trails
Democrat Gage Trail
Conduit No. 3 Trail
Cow Flat Creek Trail
Steel Flume Trail
Lucas Creek Trail
Dougherty Creek Trail
Stark Creek Trail
Adit 17 & 18 Trail
Overflow Spillway Trail
Skip Hoist / Forebay Trail
Communication and Power Lines
Intake Gatehouse to Flume No. 1 Powerline
Powerhouse to Forebay Communication / Powerline

Gages and Stilling Wells
Kern River near Democrat Springs (USGS Gage No. 11192500 / SCE Gage No. 409)
Kern River No. 1 Conduit near Democrat Springs (USGS Gage No. 11192000 / SCE Gage No. 410)
Kern River near Democrat Springs (USGS Gage No. 11192501; calculated 11192500+11192000)
Stilling Well No. 1
Stilling Well No. 2
Ancillary and Support Facilities
<i>Democrat Dam Area</i>
Buoy Line in Democrat Dam Impoundment
Democrat Dam Intake Gatehouse
Democrat Dam Drainage Tower
Democrat Dam Drainage Tunnel
Democrat Dam Drainage Tunnel Outlet
Democrat Dam Access Walkway
Sandbox Drainage Channel
Gaging Cableway
<i>Water Conveyance</i>
Flume No. 6 Access Platform
<i>Forebay Operations Area</i>
Old Admin Building
Garage No. 1
Garage No. 2
Old Ice House
Water Tank
Aerial Cable Tower
Skip Hoist House and Lower Landing
Skip Hoist Cables and Cart
Skip Hoist Upper Landing
Skip Hoist Upper Landing to Forebay Catwalk
Communication Site
Forebay Operations Area Perimeter Fence
Forebay Perimeter Fence
<i>Powerhouse Area</i>
Machine Shop
Office / Lunchroom
Restroom
Powerhouse and Switchyard Perimeter Fence