

**DRAFT
LAND 2 – NOISE
TECHNICAL STUDY PLAN**

**Rush Creek Hydroelectric Project
FERC Project No. 1389**



December 2021

DRAFT TECHNICAL STUDY PLAN LAND 2 – Noise

POTENTIAL RESOURCE ISSUES

- Protection of noise sensitive receptors (i.e., residences, businesses, recreation areas, and wildlife areas).

PROJECT NEXUS

- Routine operation of the Rush Creek Project Powerhouse may create excessive noise impacting sensitive receptors.
- Use of helicopters, construction equipment, and trucks to support construction and restoration activities associated with retrofitting/removal of Project dams, and potential enhancements in the lower Rush Creek channel may create excessive noise impacting sensitive receptors.

RELEVANT INFORMATION

The following information is available and was reviewed to determine Project noise study needs:

- Noise level limitations and definitions identified in the Mono County Code, Chapter 10.16, Noise Regulation (Mono County 2015a).
- Goals, objectives, and policies designed to control and abate environmental noise and to limit community exposure as outlined in the Mono County General Plan, Noise Element (Mono County 2015b).
- California Department of Transportation guidance on identifying potential for adverse effects due to noise or vibration (Caltrans 2020a, 2020b).
- Guidance for screening air traffic actions for potential noise impacts outlined in the Federal Aviation Administration’s Desk Reference (FAA 2020).

POTENTIAL INFORMATION GAPS

- Ambient noise (no generation at powerhouse) and noise emanating from the Rush Creek Powerhouse under different generation loads.
- Information on ambient noise and anticipated noise levels associated with use of helicopters, construction equipment, and trucks during construction and restoration activities associated with retrofitting/removal of Project dams, and potential enhancements in the lower Rush Creek channel.

STUDY OBJECTIVES

Characterize ambient and Project-generated noise at sensitive receptor areas (i.e., residences, businesses, recreation areas, and wildlife areas) and compare to applicable state and local noise regulations/ordinances associated with the following activities:

- Routine operations of the Rush Creek Powerhouse
- Retrofitting/removal of dams and potential enhancement of the lower Rush Creek channel
 - Helicopter use
 - Construction equipment use
 - Truck use

EXTENT OF STUDY AREA

- Refer to Map LAND 2-1 for the noise assessment study area. The study area for the noise assessment includes sensitive receptors:
 - In the vicinity of the Rush Creek Powerhouse (powerhouse noise).
 - Along the helicopter flight path from June Mountain Ski Area Parking Lot to top of ridge near Agnew Dam (helicopter noise).
 - Adjacent to the June Mountain Ski Area Parking Lot and the potential enhancement area in lower Rush Creek channel (construction equipment noise).
 - Along State Route 158 (SR-158) from June Mountain Ski Area Parking Lot to U.S. Highway 395 (US-395) (truck noise).
- 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 Southern California Edison (SCE) has not received specific approval from the landowner to enter the property to perform the study.

STUDY APPROACH

GENERAL APPROACH

Identify Noise Sensitive Receptors/Points of Interest

Residences, businesses, recreation areas, and wildlife areas represent locations most at risk to noise impacts and are considered noise sensitive receptors or Points of Interest (POI). The identification of applicable POI for the noise analysis will consider the local terrain, existing land uses, recreational activities, and wildlife occurrences. For each of

the study components, selection of POI will identified in consultation with resource agencies and interested stakeholders.

Field Characterize of Ambient/Project-Induced Noise

Accurately field characterizing of ambient/Project-induced noise requires measurements at or near identified POI using appropriate equipment for the level of accuracy desired. To accomplish this goal, field measurements will utilize an integrating sound level meter similar to a Larson Davis 824/831 and associated pre-amplifier and microphone. The entire system will be certified by an independent authority attesting to the accuracy of the equipment meeting the following performance standards describing tolerance limits and operational temperature range:

- IEC 61672-1:2013, Class 1 (IEC 2013)
- ANSI S1.4, ANSI S1.43 Type 1 (ANSI 1983, ANSI 1997)

A separate acoustic calibrator will be used before and after field measurements to ensure proper equipment function.

The goal is to capture typical conditions at each POI. Summer through fall comprises the primary vacationing period within the study area with numbers of visitors peaking roughly July and August. Because noise generating activity associated with recreation (primarily vehicle traffic) fluctuates based on numbers of visitors, a single ambient noise measurement would be inadequate to fully describe the existing noise environment and potential for impacts. Therefore, ambient noise measurements would be performed at each site during the following three periods:

1. June: Early in the recreation season with fewer visitors and lower anticipated ambient noise levels.
2. August: Peak recreation season with the most visitors expected and the greatest ambient noise levels.
3. October: End of recreation season with fewer visitors and lower anticipated ambient noise levels.

For each study component, the noise study team will engage the resource agencies and interested stakeholders for background information to guide the planning of these measurements, particularly in determining the most appropriate deployment dates.

Analysis Metrics

Noise metrics quantify sounds so they can be compared with each other, and with their effects, in a standard way. This noise study will rely upon the following metrics to describe the noise environment in the study area.

- **Maximum Sound Level (L_{max})** represents the highest A-weighted sound level measured during a single event in which the sound changes with time. L_{max} is the maximum level that occurs over a fraction of a second so it does not fully describe the noise, because it does not account for how long the sound is heard.
- **Equivalent Sound Level (L_{eq})** is a “cumulative” metric that combines a series of noise events representing the decibel average of all sounds in the time period. The time period of an L_{eq} measurement is usually related to some activity and is given along with the value. Periods of 1 hour provide an appropriate assessment period for many environmental measurements with the time period often shown in parenthesis ($L_{eq(1)}$ for 1 hour).
- **Community Noise Equivalent Level (CNEL)** is a variation of the Day-Night Average Sound Level (DNL) that is prescribed by the State of California for airport noise rating and building code standards (California Code of Regulations, title 21 Public Works, subchapter 6; California Administrative Code, Title 25, Building Standards, Chapter 2.5). CNEL is a cumulative metric that accounts for all noise events in a 24-hour period. Similar to $L_{eq(24)}$ except DNL contains an evening and nighttime noise penalty of 4.77 and 10 dB, respectively, to account for the added intrusiveness of environmental noise during those periods.

SPECIFY STUDY COMPONENTS

- The following describes the approach for each study component.

Powerhouse Operation

- Identify noise sensitive POI in the vicinity of the Rush Creek Powerhouse.
 - SCE currently proposes to establish the following POI:
 - Within 100 meter (m) of the Rush Creek Powerhouse, and
 - Two to three POI in the vicinity of the powerhouse (pending landowner permission) to be identified in consultation with resource agencies and interested stakeholders.
- Characterize ambient noise (no generation at the powerhouse) and noise emanating from the Rush Creek Powerhouse under different generation loads at noise sensitive POI.
 - Ambient noise levels will be characterized, in terms of L_{max} and $L_{eq(1)}$, at each POI.
 - Because CNEL requires at least 24-hours to measure directly at each POI, which may be impractical, the level will be approximated from $L_{eq(1)}$ with the appropriate period adjustments prescribed by the CNEL metric. If it is observed at any POI that the captured $L_{eq(1)}$ includes significant human contributions

likely to vary throughout the day (i.e. people or vehicular traffic) then additional evening or nighttime $L_{eq(1)}$ measurements at that POI may be captured as well to refine the CNEL approximation of the ambient noise.

- When capturing the powerhouse noise contribution, the loudest condition may occur at the greatest equipment load or potentially at a reduced load if such a condition excites the equipment's resonant frequency. Due to this uncertainty, coordination with the powerhouse operators and local stakeholders will be conducted to determine the appropriate load conditions to capture. Analysis of historical load conditions at the Rush Creek Powerhouse can guide this consideration.
- Consistent with the ambient condition, L_{max} and L_{eq} will be measured at each POI for various powerhouse operating loads. If the powerhouse equipment noise dominates the ambient noise and is stable over time, a full 1-hour measurement of L_{eq} will not be required and can be shortened to 1 to 2 minutes for each condition. CNEL will then be calculated for the various powerhouse load conditions based upon L_{eq} .
- Compare noise levels to applicable state and county regulations/ordinances.
 - Both the ambient and power generation noise levels will be compared to state and Mono County noise level standards, which describe maximum allowable exterior noise exposure by land use in terms of CNEL.

Helicopter Use

- Identify noise sensitive POI in the vicinity of the helicopter flight path.
 - SCE currently proposes to establish the following POI:
 - Within 100 m of the June Mountain Ski Area Parking Lot, and
 - Two to three POI along the flight path (pending landowner permission) to be identified in consultation with resource agencies and interested stakeholders.
- Characterize ambient and Project-induced noise levels at each sensitive POI.
 - Ambient noise levels will be captured in terms of L_{max} and $L_{eq(1)}$. The captured $L_{eq(1)}$ values will be used to calculate ambient CNEL at applicable POI along the helicopter flight path.
 - Helicopter noise from Project activities will be characterized using noise modeling software. The Department of Defense NOISEMAP suite of computer programs for aircraft noise modeling and analysis includes the Rotorcraft Noise Model (RNM) (Wyle 1998; Wasmer Consulting 2006a, 2006b). The RNM will

be used to predict far-field noise for single or multiple flight operations while calculating the effects of sound propagation over varying ground terrain.

- Noise levels are computed in the time domain and with a variety of integrated metrics, including L_{max} , L_{eq} , and CNEL, at receiver positions on or above the ground at specific POI and over a uniform grid. Software noise modeling is accomplished by determining and building each aircraft's flight tracks (paths over the ground) and flight profiles (which include data such as altitude, airspeed, power settings, and other flight conditions). RNM includes a database of noise spheres for various helicopters. If the specific airframe that will be used for this Project is not available a surrogate will be selected. RNM will be used to calculate L_{max} , L_{eq} , and CNEL at POI along the flight path for helicopter operations.
- Compare noise levels to applicable state and county regulations/ordinances.
 - Results will be compared with state and Mono County noise level standard for maximum allowable exterior noise exposure by land use in terms of CNEL. Single event L_{max} levels will be discussed in terms of the context and intensity of the existing environment.

Construction Equipment

- Identify noise sensitive POI adjacent to the June Mountain Ski Area Parking Lot and the potential enhancement area in the lower Rush Creek channel.
 - SCE currently proposes to establish the following POI:
 - Within 100 m of the June Mountain Ski Area Parking Lot,
 - On SCE land near SR-158 and the potential enhancement area, and
 - Two to three POI adjacent to the June Mountain Ski Area Parking Lot and the potential enhancement area to be identified in consultation with resource agencies and interested stakeholders.
- Characterize ambient and Project-induced noise levels at each sensitive POI.
 - Ambient noise levels to be captured in terms of L_{max} and $L_{eq(1)}$. The captured $L_{eq(1)}$ values will be used to calculate ambient CNEL at applicable POI.
 - Noise associated with construction equipment activity will be calculated using the Federal Highway Administration's (FHWA) software tool, the Roadway Construction Noise Model (RCNM) (FHWA 2006).
 - Input requires identification of the types of equipment (i.e., front end loader, dump truck, etc.) to be operated and the hours of operations. If such details are not available, then conservative assumptions will be made.

- The software includes the ability to compute L_{max} and L_{eq} . With knowledge of the equipment operating hours, the construction equipment CNEL will be approximated, and the results compared to the Mono County noise level standard.
- Compare noise levels to applicable state and county regulations/ordinances.
 - Results will be compared with state and Mono County noise level standard for maximum allowable exterior noise exposure by land use in terms of CNEL. Single event L_{max} levels will be discussed in terms of the context and intensity of the existing environment.

Truck Use

- Identify noise sensitive POI along SR-158 from June Mountain Ski Area Parking Lot to US-395.
 - SCE currently proposes to establish the following POI:
 - Two POI located adjacent to Silver Lake (at Silver Lake Campground and Silver Lake Resort).
 - These POI are in addition to the POI previously identified for assessment of construction equipment use.
- Characterize ambient noise levels at each sensitive POI.
 - Ambient noise levels to be captured in terms of L_{max} and $L_{eq(1)}$ at each of the POI along SR-158. The captured $L_{eq(1)}$ values will be used to calculate ambient CNEL at applicable POI.
 - Recent environmental studies will be reviewed to determine if existing noise levels have already been measured or calculated along SR-158.
 - If not available, the FHWA provides the following guidelines for establishing baseline conditions through measurement:
 - Noise measurements are usually taken at Level of Service C (LOS C) or better. LOS C is the point where traffic is as congested as it can be but moving the fastest speed allowable by law (LOS A = virtually no traffic, LOS D = gridlock).
 - Noise readings should be taken on a Tuesday, Wednesday, or Thursday.
 - Three noise readings should be taken per site in 20-minute increments and then averaged.
- Characterize Project-induced noise levels at each sensitive POI.

- The FHWA provides the Traffic Noise Model (TNM) for road vehicular noise analysis. TNM Version 2.5 includes a Low Volume Tool as a simple noise calculator for a single roadway (FHWA 2004).
 - This study will utilize the TNM Low Volume Tool to calculate the $L_{eq(1)}$ at POI along SR-158 due to the proposed truck hauling noise. $L_{eq(1)}$ values will be used to calculate CNEL at applicable POI with the addition of truck hauling noise.
- Compare noise levels to applicable state and county regulations/ordinances.
 - Results will be compared with state and Mono County noise level standard for maximum allowable exterior noise exposure by land use in terms of CNEL. Single event L_{max} levels will be discussed in terms of the context and intensity of the existing environment.

SCHEDULE

Date	Activity
March-May 2023	Identify sensitive receptors/ POI with resource agencies and stakeholders
June–October 2023	Conduct noise surveys
October 2023–January 2024	Analyze data and prepare draft report
February 2024	Distribute draft report to stakeholders
March 2024–May 2024	Stakeholders review and provide comments on draft report (90 days)
June–July 2024	Resolve comments and prepare final report
August 2024	Distribute final report in Draft License Application

REFERENCES

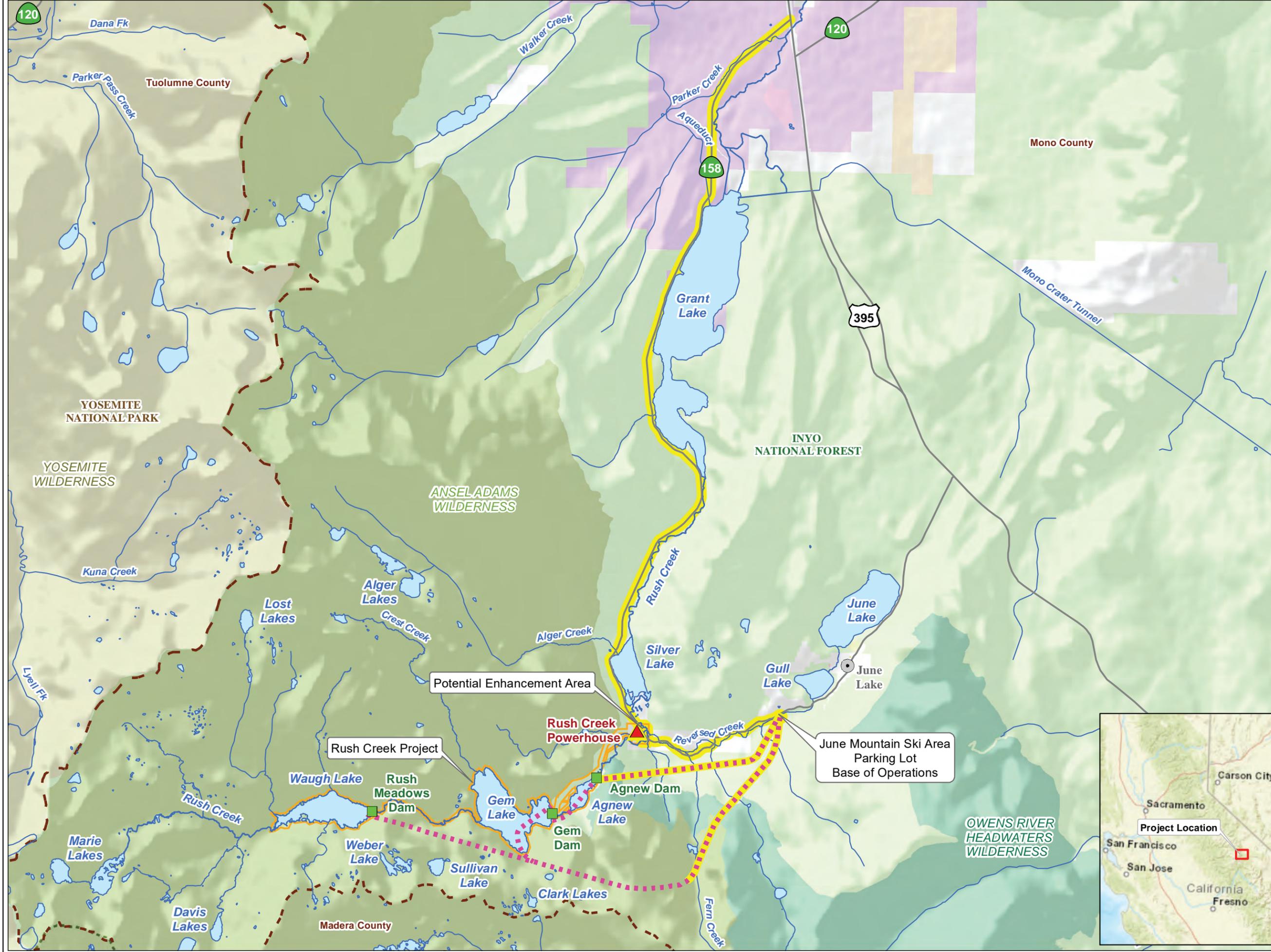
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MAPS

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- SCE Facilities**
- Dam
 - Powerhouse
 - FERC Boundary
- Other Features**
- Major City/Town
 - Highway
 - River/Stream
 - Lake
 - County Boundary
 - Approximate Helicopter Flight Path
- Land Jurisdiction and National Wilderness Areas/Parks***
- U.S. Forest Service
 - Ansel Adams Wilderness (U.S. Forest Service)
 - Owens River Headwaters Wilderness (U.S. Forest Service)
 - Yosemite National Park / Yosemite Wilderness (National Park Service)
 - Local Government
 - LADWP
 - State Government
 - Bureau of Land Management
 - Private (Blank)
- *SOURCES: BLM, 2020.
Mono Co., 2019.
Wilderness.net, 2019.

- LAND-2 Study**
- Noise Assessment Study Area



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Rush Creek Project (FERC 1389)

Map LAND 2-1

Overview of Study Area

0 0.5 1 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/11/2021

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