DEVIL CANYON PROJECT RELICENSING
FERC PROJECT NUMBER 14797

DRAFT LICENSE APPLICATION
VOLUME II OF IV

April 2019

State of California
California Natural Resources Agency
DEPARTMENT OF WATER RESOURCES
Hydropower License Planning and Compliance Office

GAVIN NEWSOM	**WADE CROWFOOT**	**KARLA A. NEMETH**
Governor	Secretary for	Director
State of California	California Natural Resources	Department of Water Resources

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Draft License Application
Exhibit E – Environmental Report

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COMMONLY USED TERMS, ACRONYMS & ABBREVIATIONS

§	Section
%	percent
<	less than
≥	greater than or equal to
--	not sampled
24/7	24 hours a day 7 days a week
°C	degrees Celsius
°F	degrees Fahrenheit
µg/L	microgram per liter
µS/cm	microsiemens per centimeter
AAQS	ambient air quality standards
ACC	Area Control Center
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act of 1990
AF	acre-feet
AGS	Annual Grassland
AIS	aquatic invasive species
alluvium	A general term for detrital deposits made by streams in recent time.
ANF	Angeles National Forest
aquatic	Living in or near water; used of plants adapted for a partially or completely submerged life
APE	Area of Potential Effects, which are all lands and facilities within the FERC Project boundary, including dams, spillways, powerhouses, recreation areas, and other appurtenant facilities, with the exclusion of non-Project facilities not affected by Project O&M, and excluding lands overlying the San Bernardino Tunnel on which DWR does not perform any Project-related activities
Application for New License	DWR's Application for a New License for Major Project – Existing Dam for the Devil Canyon Project, FERC Project Number 14797
ARG	Agricultural Supply

artificially flooded	Areas in which the amount and duration of flooding is controlled by means of pumps or siphons in combination with dikes or dams
AT&SF	Atchison, Topeka, and Santa Fe Railroad
ATL	advisory tissue level
B	Boron
B.P.	Before Present
BAR	Barren
barren	Areas within a vegetation dominated habitat that are devoid of vegetation
basement rock	The thick foundation of ancient metamorphic and igneous rock that forms the continental crust, often in the form of granite
bedrock	The solid rock that lies beneath soil and other loose surface materials
BIOL	biological habitats of special significance
BLM	U.S. Department of the Interior, Bureau of Land Management
BMI	benthic macroinvertebrates
BMP	best management practices
CA	California
ca.	circa
CaCO3	calcium carbonate
CAISO	California Independent System Operator
CAL FIRE	California Department of Forestry and Fire Protection
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CalVeg	California Vegetation Classification System
canopy	The uppermost layer of vegetation in a plant community.
CARB	California Air Resources Board
CAS	channeled apple snails
C.C.C.	Civilian Conservation Corps
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture

CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife, formerly CDFG
CDP	census designated place
CE	California Endangered
CEC	California Energy Commission
CEDEN	California Environmental Data Exchange Network
CEII	Critical Energy Infrastructure Information
Cenozoic Era	The current geological time period, covering the interval from 66 million years ago to present day; the Cenozoic is composed of Paleogene and Neogene periods
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
chaparral	A shrubland adapted to summer-dry Mediterranean climate by having shrubs with evergreen, leathery leaves, such as chamise, manzanita, or scrub oak species
C.I.	confidence interval
Cl	Chloride
CLAWA	Crestline-Lake Arrowhead Water Agency
cm	centimeter
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
colluvium	Loose, incoherent sedimentary deposits, usually at the base of a slope or cliff, that accumulate largely under the influence of gravity
COLD	Cold Freshwater Habitat
COMM	Commercial and Sportfishing
CPUE	catch per unit effort
CRC	Chamise-Redshank Chaparral
CRHR	California Register of Historical Resources
CRLF	California red-legged frog
CSC	Coastal Scrub

CSUSB	California State University, San Bernardino
CT	California Threatened
CTR	California Toxics Rule
CVP	Central Valley Project
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
dBA	decibel
dbh	diameter at breast height
DCPA	dimethyl tetrachloroterephthalate (Dacthal)
DCU	Deer Conservation Unit
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
deepwater habitats	Permanently flooded lands lying below the deepwater boundary of wetlands
deposit	Any accumulation of sediment
DLA	Draft License Application
DLR	Laboratory Detection Limits for Purposes of Reporting
DNA	deoxyribonucleic acid
DO	dissolved oxygen
DPR	California Department of Parks and Recreation
DPS	Distinct Population Segment
drainage	Any channel that carries water
DWR	California Department of Water Resources
DWR's Proposal	Continued operation of the Project, modification of the Project boundary, addition of 1 existing reservoir gage (USGS gage no. 10260790) and 10 existing roads as Project facilities under the new license, and 12 proposed environmental measures.
EAP	Emergency Action Plan
earthquake	A sudden ground motion or vibration of the Earth, produced by a rapid release of stored-up energy along an active fault

emergent	Wetlands characterized by erect, rooted, herbaceous hydrophytes (plants adapted to growing in wet conditions), excluding mosses and lichens; this vegetation is present for the majority of the growing season in most years, and most emergent wetlands are dominated by perennial plants
emergent plant	A rooted herbaceous plant species that has parts extending above a water surface
EPA	U.S. Environmental Protection Agency
ephemeral stream	A stream that flows briefly in direct response to precipitation in immediate vicinity, and whose channel is always above the water table
epicenter	The point on the Earth's surface located directly above the focus of an earthquake
ESA	Endangered Species Act
est.	estimated
EVC	existing visual condition
excavated	Areas that occur in a basin or channel that have been dug, gouged, blasted, or suctioned through artificial means
existing Project boundary	The boundary of the Project as approved by FERC in the existing license
F	Fluoride
fanglomerate	An alluvial fan deposit consisting of a heterogeneous mixture of rock fragments (i.e., a fan conglomerate)
fault	A fracture or fracture zone in the Earth's crust along which one side has moved in relative to the other; sudden movements on faults cause earthquakes
FC	federal candidate
FE	federal endangered
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FGC	California Fish and Game Code
FLA	Final License Application
flooded	A condition in which the soil surface is temporarily covered with flowing water from any source, such as streams overflowing their banks, runoff from adjacent or surrounding slopes, inflow from high tides, or any combination of sources

fluvial	Term used to describe river or stream-related features or processes; fluvial deposits (alluvium) are sediments deposited by the flowing water of a stream
forest	An area (or vegetation type) in which trees dominate in the overstory where their crowns generally overlap (with greater than 60 percent canopy cover)
formation	A rock formation is a body of rock of considerable extent with distinctive characteristics that allow geologists to map, describe, and name it
FP	California fully protected
FPA	Federal Power Act
fps	foot per second
FR	Federal Register
FSS	Listed as Sensitive by the U.S. Department of Agriculture, Forest Service
FT	federal threatened
GHG	greenhouse gas
GIS	Geographic Information System
gneiss	A high-grade metamorphic rock that commonly has coarse-grained, foliated alternating bands of light and dark-colored minerals
GPS	Global Positioning System
growing season	The portion of the year when soil temperatures at 19.7 inches below the soil surface are higher than biologic zero (5ºC). For ease of determination this period can be approximated by the number of frost-free days.
Guidelines	California State Parks Accessibility Guidelines
GWR	Ground Water Recharge
HCP	Habitat Conservation Plan
herbaceous-dominated	Herbaceous cover exceeds 2 percent. Trees and shrubs do not exceed 10 percent cover. If less than 2 percent of the site is covered with herbaceous species, the site is considered barren
herbaceous layer	Any vegetative stratum of a plant community that is composed predominantly of herbs
Holocene	An epoch of the Quaternary Period beginning approximately 11,700 years ago and continuing today

hp	horsepower
HPMP	Historic Properties Management Plan
HU	Hydrologic Unit
igneous rock	Rock formed when molten or partly molten earth material (magma) that has cooled and solidified (crystallized). Such rock may be intrusive (plutonic) and/or extrusive (volcanic) igneous rock
Indian Tribe	Used in the NHPA and by FERC to mean an Indian community or group that is recognized by the federal government.
Impounded	Areas that have been created or modified by a man-made barrier or dam which obstructs the inflow or outflow of water
IVMP	Integrated Vegetation Management Plan
intermittent stream	A stream that has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from precipitation is a supplemental source of water for stream flow
intermittent	Describes channels that contain flowing water only part of the year, but may contain isolated pools when the flow stops
Intrusive rock	Igneous rock that cools and solidifies beneath the Earth's surface (i.e., plutonic igneous rock)
inundation	A condition in which water from any source temporarily or permanently covers a land surface
ITA	Indian Trust Assets
KOP	key observation point
kW	kilowatt
L%	percentile distribution of sound levels
LAC	Lacustrine
Lacey Act	Federal law, as amended in 2008, prohibiting traffic in certain fish, wildlife, and plant species
Lacustrine System	Wetlands and deepwater habitats that: (1) are located in a topographic depression or a dammed river channel; (2) are lacking in trees, shrubs, persistent emergent plants, emergent mosses or lichens with greater than 30 percent areal coverage; and (3) are greater than 20 acres in area

LADWP	Los Angeles Department of Water and Power
lake	Permanent lakes or reservoirs greater than 2 surface hectares (5 surface acres)
Ldn	day-night average sound level
Leq	equivalent sound level
lentic	Riparian-wetland areas that are not lotic (riverine)
LFR	Las Flores Ranch
limnetic	Extends outward from littoral boundary and includes all deep-water habitats within the Lacustrine System
littoral	Standing water depths of less than 6.6 feet within the Lacustrine System
lotic	Riparian areas with flowing freshwater
M	magnitude of an earthquake on the Richter scale
m	meter
m^3	cubic meter
magnitude	A measure of the total amount of strain energy released by an earthquake, as determined by a seismograph
marsh	An ecosystem of more or less continuously waterlogged soil dominated by immersed herbaceous plants, but without a surface accumulation of peat
MCH	Mixed Chaparral
MCL	maximum contaminant level
mesic	Pertaining to conditions of moderate moisture or water supply; used of organisms occupying moist habitats
Mesozoic Era	The geologic time period between approximately 252 and 66 million years ago marking the time between the Permian-Triassic and Cretaceous-Paleogene extinction events. The Mesozoic is composed of the Triassic, Jurassic and Cretaceous periods.
metamorphic rock	A rock of any origin (i.e., sedimentary, igneous or metamorphic) that has undergone secondary chemical or structural changes produced by increases in heat and/or pressure, or by replacement of elements by hot, chemically active fluids.
mg	milligram
mg/L	milligram per liter

MHC	Montane Hardwood-Conifer
MHW	Montane Hardwood
MIB	Methylisoborneol
ml	milliliter
MOU	Memorandum of Understanding
MRNHA	Mojave River Natural History Association
msl	mean sea level
MTBE	methyl tert-butyl ether
MUN	Municipal and Domestic Supply
MW	megawatt
MWA	Mojave Water Agency
MWD	Metropolitan Water District of Southern California
MWh	megawatt hour
mya	million years ago
N	Nitrogen
N/A	not applicable
NAD	North American Datum
NAHC	Native American Heritage Commission
NAS	Nonindigenous Aquatic Species (USGS location database)
Native Americans	Indigenous people who lived in the area prior to the arrival of Europeans. Encompasses all indigenous communities potentially interested in or affected by the relicensing, regardless of federal recognition.
NAWMP	North American Waterfowl Management Plan
ND	non detection
NE	northeast
NEPA	National Environmental Policy Act
NFFZ	North Frontal Fault Zone; a zone consisting of several fault segments that define the north boundary of the San Bernardino Mountains
NFS	National Forest System
NGO	non-governmental organization
NH_3	Ammonia

NH_4	Ammonium
NHPA	National Historic Preservation Act
NMWSE	Normal Maximum Water Surface Elevation
NNIP	non-native invasive plant
NO_2	nitrogen dioxide
NO_3-N	Nitrate as Nitrogen
NOI	Notice of Intent to File an Application for a New License
NPDES	National Pollutant Discharge Elimination System
NPS	U.S. Department of the Interior, National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NTR	National Toxics Rule
NTU	Nephelometric Turbidity Unit
NWI	National Wetlands Inventory
O&M	operations and maintenance
O_3	ozone
OEHHA	California Office of Environmental Health Hazard Assessment
OHP	Office of Historic Preservation under the California Department of Parks and Recreation
OHV	off-highway vehicle
P	phosphorus
PAC	USFS Protected Activity Center
PAD	Pre-Application Document
Paleozoic Era	The geologic time period between about 540 to 250 million years ago. The Paleozoic is composed of the Cambrian, Ordovician, Silurian, Devonian, Carboniferous and Permian periods.
Palustrine	All nontidal wetlands dominated by trees, shrubs, emergent plants, mosses, or lichens
PAOT	persons at one time
PCA	Pest Control Advisor

PCB	polychlorinated biphenyl
PCT	Pacific Crest National Scenic Trail
PCTA	Pacific Crest Trail Association
PFC	Properly Functioning Condition
PFMA	Potential Failure Mode Analysis
PHG	Public Health Goal
PM2.5	Fine particulate matter less than or up to 2.5 micrometers in diameter
PM10	Respirable Particulate Matter less than or up to 10 micrometers in diameter
PM&E measures	Protection, Mitigation, and Enhancement measures, which are operation and management activities to: (1) protect resources against impacts from continued O&M of the Project; (2) mitigate any impacts from continued O&M of the Project (if the resource cannot be fully protected); and (3) enhance resources affected by continued Project O&M
PO_4	Phosphate
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
Privileged	For the purposes of the FERC's filing requirements, material deemed confidential by DWR will be filed with FERC as "Privileged." This information includes material, including, but not limited to, the location of sensitive cultural resources and the location of protected species, such as species listed as threatened or endangered under the Endangered Species Act, as well as business-sensitive information. Each page containing Privileged information will be so marked. DWR will not provide Privileged material to the public. Upon request, DWR will provide Privileged material to those agencies and Native American tribes with jurisdiction over the resources related to the Privileged material
Project	Devil Canyon Project, FERC Project Number 14979
Project area	The area within the FERC Project boundary and the area immediately surrounding the FERC Project boundary
Project boundary	See "existing Project boundary" and "proposed Project boundary"

Project region	The area within the FERC Project boundary and the area surrounding the Project on the order of a county or National Forest
Project vicinity	The area within the FERC Project boundary and the area surrounding the Project on the order of a USGS 1:24,000 quadrangle
proposed Project boundary	The boundary of the Project as proposed by DWR, pending approval from FERC in the new license. Includes all existing Project facilities, but adjusts the boundary to: (1) add lands to the existing Project boundary that are currently utilized with a preponderance of use related to Project O&M, and (2) remove lands from the existing Project boundary that do not have Project facilities and are not used or necessary for Project O&M. Also includes proposed changes to the existing Project boundary around the Project reservoir and impoundments from surveyed coordinates to a contour located above the NMWSE to reflect FERC's preferred method of defining a project's boundary and to more accurately represent lands required for Project O&M around the Project reservoir.
QA/QC	quality assurance/quality control
Quaternary Period	The current and most recent geologic time period of the Cenozoic Era that encompasses the time interval between about 2.6 million years ago through today. Quaternary time includes the Pleistocene and Holocene epochs.
RARE	rare and endangered species
REC-1	Water Contact Recreation
REC-2	Noncontact Water Recreation
Recreation Report	2015 FERC Form 80
Relicensing Participants	FERC, federal, and State agencies; Native American tribes; local governments; NGOs; businesses; members of the public; and others interested in the Project relicensing
RES	red-eared slider
riparian	Vegetated zones that form a transition between permanently saturated areas and upland areas and that typically exhibit vegetation and physical characteristics associated with permanent sources of surface or groundwater

Riverine Systems	Habitats contained in natural or artificial channels with periodically or continuously flowing water, or which form a connecting link between two bodies of standing water
RMP	Recreation Management Plan
RMRC	Rocky Mountain Recreation Company
ROS	recreation opportunity spectrum
rpm	revolutions per minute
RV	recreational vehicle
RWQCB	Regional Water Quality Control Board
shrub	A layer of vegetation composed of woody plants less than 3.0 inches in diameter at breast height but greater than 3.2 feet in height, exclusive of woody vines
saturated	Wetlands in which the substrate is saturated to the surface for extended periods during the growing season, but surface water is seldom present
SBCFD	San Bernardino County Fire Department
SBNF	San Bernardino National Forest
SC	State candidate
SCBC	Southern California Bass Council
SCCIC	South Central Coastal Information Center
SCE	Southern California Edison
SCORP	California State Comprehensive Outdoor Recreation Plan
scrub	Vegetation characterized by shrubs; may be classified by habitat type or by characteristic species
SE	California State endangered
SEM	Schumachmeyer method
SIO	scenic integrity objective
SIP	State Implementation Policy
SM	Schnabel method
SMC	Sierran Mixed Conifer
SMCL	secondary maximum contaminant level
SMBMI	San Manuel Band of Mission Indians
SMYLF	southern mountain yellow-legged frog
SO_2	sulfur dioxide

SO_4	sulfate
SOP	Standard Operating Procedure
SOPA	Survey on Public Opinions and Attitudes on Outdoor Recreation in California
SRA	State Recreation Area
SSC	California Species of Special Concern
SSU	Surface Scrape Units
ST	California State threatened
State	State of California
STID	Supporting Technical Information Document
substrate	The base or substance on which an attached species is growing
surface water	Water present above the substrate or soil surface
SVL	snout to vent length
SW	southwest
SWAMP	Surface Water Ambient Monitoring Program
SWP	State Water Project
SWRCB	State Water Resources Control Board
TCP	Traditional Cultural Properties
TDS	total dissolved solids
Tertiary Period	The earliest geologic time interval of the Cenozoic Era, beginning about 65 million years ago and ending 2.6 million years ago.
TLP	Traditional Licensing Process
TMDL	Total Maximum Daily Load
topography	The shape of the land surface
tree	A woody plant greater than 3.0 inches in diameter at breast height, regardless of height (exclusive of woody vines)
unconsolidated	Loosely aggregated sediment; lacking cohesion or cement
unconsolidated bottom	All wetland and deepwater habitats with at least 25 percent cover of particles smaller than stones, and a vegetative cover less than 30 percent

unconsolidated shore	Wetlands and deepwater habitats characterized by substrates lacking vegetation except for pioneer plants that become established during brief periods when growing conditions are favorable
understory	The vegetation layer between the overstory or canopy and the ground-story of a forest community, formed by shade tolerant trees of moderate height
upland	Any area that does not qualify as a wetland because the associated hydrologic regime is not sufficiently wet to elicit development of vegetation, soils, and/or hydrologic characteristics associated with wetlands. Such areas occurring within floodplains are more appropriately termed non-wetlands.
URB	Urban
USACE	U.S. Army Corps of Engineers
U.S.	United States
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Department of the Interior, Fish and Wildlife Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
vegetation	The total plant life or cover in an area; also used as a general term for plant life; the assemblage of plant species in a given area
VRI	Valley Foothill Riparian
W	west
WARM	Warm Freshwater Habitat
Wash	A normally dry stream bed that occasionally fills with water
waters of the United States	Regulated under the Clean Water Act, and includes waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce; their tributaries; and adjacent waters, including wetlands, ponds, lakes, impoundments and similar waters
WECC	Western Electricity Coordination Council
weed	Any plant growing where it is not wanted

wetlands	Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and which, under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil conditions
WILD	Wildlife Habitat
WPLT	Western Pluvial Lakes Tradition
WQO	water quality objectives
WSLFZ	West Silverwood Lake Fault Zone
WY	water year

1.0 INTRODUCTION

1.1 DWR'S APPLICATION FOR A NEW LICENSE

The California Department of Water Resources (DWR) has prepared this Exhibit E, Environmental Report, as part of its Application for a New License Major Project – Existing Dam (Application for New License) from the Federal Energy Regulatory Commission (FERC) for the Devil Canyon Project, FERC Project Number 14797 (Project). This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (CFR), Subchapter B (Regulations under the Federal Power Act [FPA]), Part 4 (Traditional Licensing Process, or TLP). Specifically, this exhibit conforms to the regulations in 18 CFR Section (§) 4.51(f). Further, this Exhibit E was prepared in general conformance with FERC's *Preparing Environmental Assessments: Guidelines for Applicants, Contractors and Staff* (FERC 2008).

1.2 BRIEF DESCRIPTION OF DWR'S PROPOSAL

The existing Project is part of a larger water storage and delivery system, the State Water Project (SWP), which is the largest state-owned and operated water supply project of its kind in the United States (U.S.). The SWP provides southern California with many benefits, including affordable water supply, reliable regional clean energy, opportunities to integrate green energy, accessible public recreation opportunities, and environmental benefits. The current FERC license for the existing Project expires on January 31, 2022.

The existing Project has an authorized installed capacity of 272,796 kilowatts (kW) and is located in San Bernardino County, on the East Branch of the SWP. Project facilities range in elevation from 3,378 feet to 1,778 feet, and include: Cedar Springs Dam and Silverwood Lake; San Bernardino Tunnel; Devil Canyon Powerplant Penstocks and Surge Chamber; Devil Canyon Powerplant and Switchyard; Devil Canyon Afterbay and Devil Canyon Second Afterbay; Silverwood Lake-associated recreation facilities; and appurtenant facilities and features. The California Department of Parks and Recreation (DPR), on behalf of DWR, maintains and operates the Silverwood Lake-associated Project recreation facilities as part of the Silverwood Lake State Recreation Area (SRA). Non-Project facilities (e.g., the Pacific Crest National Scenic Trail [PCT] and various DPR facilities) are located in the Silverwood Lake SRA but are not Project facilities.

The Project does not include any open water conduits other than the Devil Canyon Afterbay's Cross Channel, nor does the Project include a primary transmission line. The Project's existing FERC boundary includes 3,744.0 acres, of which 221.0 acres are National Forest System (NFS) lands managed by the U.S. Department of Agriculture, Forest Service (USFS), as part of the San Bernardino National Forest (SBNF). The existing Project is operated as a power recovery project using only SWP water.

DWR's Proposal includes all existing Project facilities without modification. DWR's Proposal includes a modification to the existing Project's boundary, which would have

the net effect of reducing the area within the boundary from 3,744.0 acres to 2,079.4 acres. This change would reduce the 221.0 acres of NFS lands to 125.9 acres.

Further, DWR's Proposal would be operated as the existing Project has been operated historically, with the addition of a number of Protection, Mitigation, and Enhancement (PM&E) measures, which are operation and management activities to: (1) protect resources against adverse effects from continued operation and maintenance (O&M) of the Project; (2) mitigate any effects from continued O&M of the Project (if the resource cannot be fully protected); and (3) enhance resources affected by continued Project O&M.

DWR's Proposal would be able to continue to provide southern California with affordable water supply to supplement local resources; generate clean hydropower; provide significant public recreation opportunities easily accessible to visitors to the area and residents of the surrounding communities; and provide environmental benefits. DWR anticipates that, under its Proposal, the Project would generate an average of about 836,000 megawatt-hours (MWh) of energy annually, which represents a gross annual power value of $33,759,000. Annual costs under DWR's Proposal would be $27,136,000. Therefore, the net annual benefits would be $6,623,000, which would be used by DWR to offset SWP costs.

Figure 1.2-1 shows the Project vicinity. Figure 1.2-2 shows Project facilities; the existing and proposed Project boundaries are shown for reference.

Figure 1.2-1. Devil Canyon Project Vicinity

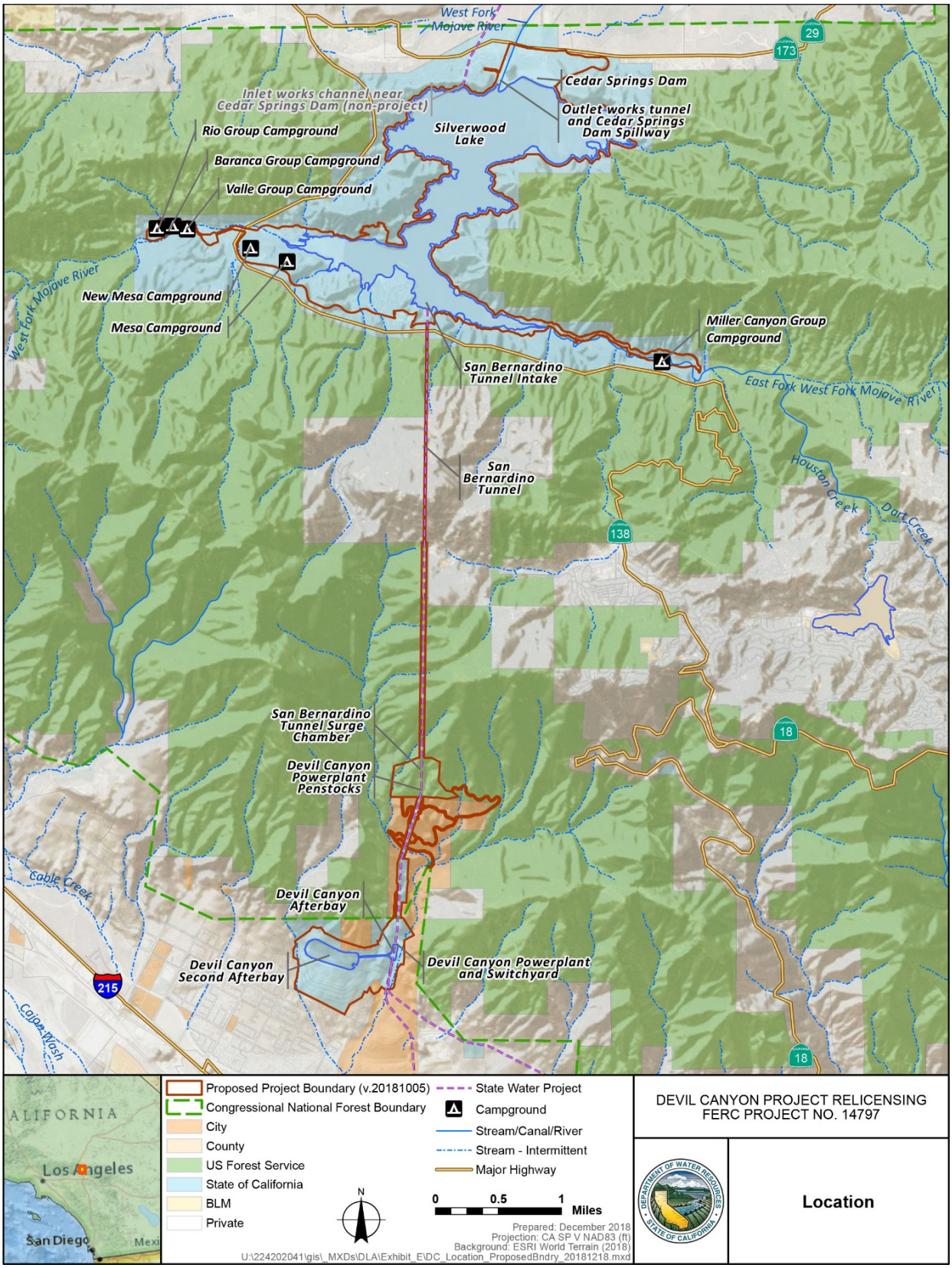


Figure 1.2-2. DWR's Proposed Devil Canyon Project

1.3 PURPOSE OF ACTION AND NEED FOR POWER

1.3.1 Purpose of Action

FERC must decide whether to issue a new license to DWR for the Project and what conditions should be placed in the license, if issued. In deciding whether to issue a license for the Project, FERC must determine that the Project will be best adapted to a comprehensive plan for improving or developing the waterway. In addition to the power and developmental purposes for which licenses are issued, FERC must give equal consideration to the purposes of energy conservation; the PM&E measures for fish and wildlife, including related spawning grounds and habitat; the provision of recreational opportunities; and the preservation of other aspects of environmental quality. Issuing a new license for the Project would allow DWR to continue to generate electricity at the Project for the term of the new license, making electric power from a renewable resource available to the California Power Grid. DWR would continue to offset the pumping costs of the SWP with generation from the Project so DWR can continue to provide sustainable and affordable consumptive water to southern California.

1.3.2 Need for Power

The Project is located in the California-Mexico Power area of the Western Electricity Coordination Council (WECC). According to the California Energy Commission (CEC), electricity consumption statewide is projected to grow at an annual average compounded rate of 1.64 percent from 2017 through 2027 (Kavalec et al. 2018). Under DWR's Proposal, the Project would continue to meet part of existing load requirements within the system, which is in need of resources.

Sale of the Project's power capacity and generation provides revenue that helps defer the cost of electricity needed to pump water through the SWP. Power from the Project meets a need for power in the WECC region in both the short- and long-term. The Project would continue to provide low-cost, clean power.

Any decrease in power generation at the Project would need to be offset by zero emission energy from other resources. All generation of the Project is sold directly through the CAISO energy markets. Although DWR does not maintain reserve margins it is important that DWR maintain a source of zero emissions generation to adhere to the Department's Climate Action Plan as well as strive towards the State mandated greenhouse gas reductions (Senate Bill 350) and renewable portfolio standards (Senate Bill 100).

1.4 CONSULTATION DOCUMENTATION

FERC's regulations (18 CFR § 16.8) require that an applicant consult with appropriate federal and state agencies, local governments, Indian tribes, non-governmental organizations, businesses and unaffiliated members of the public that may be interested in the proceeding before filing an application for a license. This consultation is the first

step in complying with the National Historic Preservation Act (NHPA), Endangered Species Act (ESA), and other applicable federal statutes. Pre-application filing consultation must be completed and documented according to FERC's regulations.

On August 1, 2016, DWR filed with FERC a request to use FERC's TLP to relicense the Project. FERC granted DWR's request in a letter dated September 30, 2016.[1] The TLP includes three stages of consultation. DWR's consultation efforts by consultation stage are described below.

If a document mentioned in this section has already been filed with FERC in the Project relicensing docket, to reduce redundancy, the document is not attached to this Application for New License, but the accession number in FERC's eLibrary is noted and the document is included in this Application for New License by reference. DWR assumes documents in FERC's eLibrary, excluding Privileged or Critical Energy Infrastructure Information (CEII), are accessible by all interested parties. However, if a party would like a copy of a specific Public document referenced below and that party is unable to access the document on FERC's eLibrary, the party may contact DWR, which will provide the document.

1.4.1 First Stage Consultation

First Stage Consultation begins when an applicant for a new license files its Notice of Intent (NOI) to file an application for a new license and its Pre-Application Document (PAD) (18 CFR §4.38[b][1]) and ends after all participating agencies and Indian tribes provide written comments on the applicant's NOI and PAD (18 CFR § 4.38[b][7]).

1.4.1.1 Pre-Filing of NOI and PAD

Prior to filing its NOI and PAD, DWR initiated consultation with agencies and others that may be interested in the Project relicensing. This early consultation included requesting from agencies and other entities existing, relevant, and reasonably available information the party may have regarding the Project, potentially affected resources, potential Project effect issues, and potential studies. Documentation of these requests and responses are provided in DWR's PAD.[2]

To expedite relicensing, DWR invited agencies to a September 9, 2015, initial relicensing meeting and site visit. The purposes of the meeting and site visit were to initiate discussions with resource agencies as part of information gathering and issue identification for the PAD, and to provide resource agencies with an overview of Project facilities being relicensed and the proposed relicensing process. In addition to DWR representatives, 10 people attended the pre-NOI and pre-PAD filing meeting and site visit: five USFS representatives; one U.S. Department of the Interior, Fish and Wildlife Service (USFWS) representative; two State Water Resources Control Board (SWRCB)

[1] FERC Accession No: 20161014-5155.
[2] FERC Accession No: 20160801-5241.

representatives; one California Department of Fish and Wildlife (CDFW) representative; and one Los Angeles Department of Water and Power (LADWP) representative.

1.4.1.2 Filing of NOI and PAD

On August 1, 2016, DWR filed with FERC its NOI[3] and PAD.[4] The NOI stated DWR's unequivocal intent to file an Application for New License for the Project by January 31, 2020, two years prior to expiration of the existing license. The PAD provided summaries of existing, relevant, and reasonably available information regarding the Project; resources potentially affected by the Project; any known or suspected resource impacts; and outlines for nine studies that DWR proposed to conduct to supplement existing, relevant, and reasonably available information. The studies were:

1. Aquatic Invasive Species
2. Botanical Resources
3. Non-Native Invasive Plants
4. Special-Status Terrestrial Wildlife Species
5. ESA-Listed Bird Species – Southwestern Willow Flycatcher and Least Bell's Vireo Riparian Habitat Evaluations and Surveys
6. ESA-Listed Plants
7. Recreation Facility Condition Assessment
8. Cultural Resources
9. Tribal Resources

In addition, DWR proposed collecting incidental observations of southern western pond turtle (*Actinemys pallida* [or *Actinemys marmorata pallida*]) during all relicensing studies to supplement existing information. FERC issued an NOI, Filing of the PAD, and Approving Use of the TLP on September 30, 2016.[5]

1.4.1.3 Site Visit and Joint Meeting and Initial Indian Tribe Consultation During First Stage Consultation

On October 13, 2016, DWR filed with FERC and provided to agencies a letter advising that DWR had coordinated with agencies, Indian tribes, and members of the public to

[3] FERC Accession No: 20160801-5248.
[4] FERC Accession No: 20160801-5241.
[5] FERC Accession No: 20161014-5155.

schedule a site visit and joint agency/public meeting.[6] The letter included an agenda for the joint meeting. On October 14, 2016, DWR placed a notice of the joint meeting in a newspaper in San Bernardino County, the county in which the Project is located.

The site visit occurred on November 2, 2016. In addition to DWR representatives, nine people attended the site visit: four from USFS; one from SWRCB; two from DPR; one from the San Manuel Band of Mission Indians (SMBMI); and one from the Metropolitan Water District of Southern California (MWD).

The joint meetings occurred on November 3, 2016, in the morning and evening: the agendas for the two meetings were identical. The purposes of the meetings were to provide agencies, Indian tribes, and members of the public an opportunity to discuss the information in the PAD, discuss data and studies to be developed by DWR, and express their views regarding resource issues that should be addressed in DWR's Application for New License. In addition to DWR representatives and the meeting transcriber, 10 people attended the morning session: five from USFS; two from the SWRCB; one from the SMBMI; one from Cal Trout; and one from MWD. Two people attended the evening session: one from USFS and one from the SWRCB.

On December 12, 2016, DWR filed with FERC documentation of DWR's site visit and joint meetings, including meeting transcripts and proof of publication of the joint meetings public notices.[7] On May 15, 2017, DWR held an initial Section 106 meeting. In addition to DWR representatives, the meeting was attended by five people: one SMBMI representative; one Morongo Band of Mission Indians representative; two USFS representatives; and one SHPO representative. Additionally, a FERC representative participated in the meeting by telephone.

In separate letters dated August 10, 2016, FERC invited the SMBMI[8] and the Morongo Band of Mission Indians[9] to meet with FERC staff to ensure that issues of concern to each tribe were being addressed in the pre-filing phase of the relicensing process. On February 13, 2017, FERC staff filed a memorandum regarding its efforts to contact the Morongo Band of Mission Indians. FERC's memorandum dated February 15, 2017 documented FERC's consultation meeting with SMBMI on October 17, 2016.[10]

1.4.1.4 Comments on NOI and PAD

On December 24, 2016, and January 3, 2017, the SWRCB[11] and CDFW,[12] respectively, requested a 60-day extension from January 2, 2017 to March 2, 2017, for the SWRCB's

[6] FERC Accession No: 20161014-5155.
[7] FERC Accession No: 20161213-5141.
[8] FERC Accession No: 20160810-3040.
[9] FERC Accession No: 20160810-3034.
[10] FERC Accession No: 20170214-4002.
[11] FERC Accession No: 20161216-5011.
[12] FERC Accession No: 20170103-5152.

and CDFW's filings of comments on the NOI and PAD. Six parties filed comments on DWR's NOI and PAD: SBNF;[13] SMBMI;[14] NPS;[15] Pacific Crest Trail Association (PCTA);[16] SWRCB;[17] and CDFW[18] (Table 1.4-1).

Table 1.4-1. Parties that Filed Comments with FERC on DWR's Notice of Intent and Pre-Application Document

Commenter	Date of Comment Letter
SBNF	December 20, 2016
SMBMI	December 29, 2016
NPS	December 30, 2016
PCTA	January 10, 2017
SWRCB	March 2 2017
CDFW	March 3, 3017

Key:
CDFW = California Department of Fish and Wildlife
NPS = National Park Service
PCTA = Pacific Crest Trail Association
SBNF = San Bernardino National Forest
SMBMI = San Manuel Band of Mission Indians
SWRCB = State Water Resources Control Board

DWR reviewed the six comment letters and found that letters from NPS and PCTA did not include any requests for modifications to the studies proposed by DWR in its PAD or new studies (i.e., a study not proposed by DWR in its PAD). On page 4 of its letter, the NPS stated: "Finally, the NPS notes that information in the PAD on carrying capacity of Project facilities is insufficient. While the NPS acknowledges that additional information is needed, to fully understand Project-related impacts on recreation within the Project area, the NPS is not making any study requests to gather such information at this time. Instead, the NPS defers to the assessment of recreation information needs made by the San Bernardino National Forest." The letter from PCTA expressed a concern regarding the PCT, but did not request modifications to DWR's proposed studies or new studies regarding the trail.

Table 1.4-2 lists, by study and comment letter, the number of study modifications and new studies requested by SBNF, SWRCB, CDFW, and SMBMI in their comment letters.

[13] FERC Accession No: 20161219-5269.
[14] FERC Accession No: 20170106-0008.
[15] FERC Accession Nos: 20161230-5213 and 20170111-0017.
[16] FERC Accession No: 20170110-0020.
[17] FERC Accession Nos: 20170302-5212 and 20170308-0080.
[18] FERC Accession No: 20170303-5017.

Table 1.4-2. Requested Study Modifications and New Studies

DWR Proposed Study in PAD	SBNF	SWRCB	CDFW	SMBMI	Total
NUMBER OF REQUESTED MODIFICATIONS TO DWR PROPOSED STUDIES IN ITS PAD					
Aquatic Invasive Species			5		5
Botanical Resources			2	1	3
Non-Native Invasive Plants			2		2
Special-Status Terrestrial Wildlife Species			1		1
ESA-Listed Bird Species – Southwestern Willow Flycatcher and Least Bell's Vireo Riparian Habitat Evaluations and Surveys			3		3
ESA-Listed Plants			2	1	3
Recreation Facility Condition Assessment					
Cultural Resources				11	11
Tribal Resources					
Subtotal	**0**	**0**	**15**	**13**	**28**
Total	**28 Requested Study Modifications**				
NUMBER OF REQUESTED NEW STUDIES					
Water Quality	1	1	1		3
Channel Morphology	1	1			2
Hydrologic Alteration / Flow Regime	1	1			2
Groundwater	1				1
Aquatic Invasive and Non-Native Species	1				1
Wildlife Sensitive Species – Bats	1		1		2
Wildlife: ESA Species	1				1
Forest Service Sensitive and CDFW Species of Special Concern	1				1
Terrestrial Invasive Species	1				1
Wildlife: Large Mammal Movement	1				1
Wildlife Raptor Species	1				1
Assess the Health and Safety of Recreationists and USFS Resources in Project Area	1				1
Assess Management/Traffic Impacts for Roads and Trails in the Project Area	1				1

Table 1.4-2. Requested Study Modifications and New Studies (continued)

DWR Proposed Study in PAD	SBNF	SWRCB	CDFW	SMBMI	Total
Assess Projected Recreation Use and Demand in the Project Area	1				1
Assess Recreation Carrying Capacity of the Project Area	1				1
Assess Fire-Hazards from Project-Induced Recreation	1				1
Water Balance / Operations Model		1			1
Water Temperature Model		1			1
Bioaccumulation		1			1
Special Status Species		1			1
Fish Entrainment		1			1
Benthic Macroinvertebrates		1	1		2
Instream Flow Habitat			1		1
Special-Status Aquatic Species			1		1
Tributary Fish			1		1
Entrainment			1		1
Fish Microhabitat Assessment			1		1
Bald Eagle			1		1
Peregrine Falcon			1		1
Subtotal	**16**	**9**	**10**	**0**	**35**
Total	**29 Requested New Studies**				

Key:
CDFW = California Department of Fish and Wildlife
DWR = California Department of Water Resources
ESA = Endangered Species Act
PAD = Pre-Application Document
SBNF = San Bernardino National Forest
SMBMI = San Manuel Band of Mission Indians
SWRCB = State Water Resources Control Board
USFS = U.S. Department of Agriculture, Forest Service

1.4.2 Second Stage Consultation

Second Stage Consultation begins when an applicant commences all reasonable studies (18 CFR § 4.38[c][1]), and ends after the applicant holds the last joint meeting to resolve any substantive disagreements with the applicant's conclusions in its draft application regarding resource impacts or its proposed PM&E measures (18 CFR § 4.38(e)(10).

1.4.2.1 DWR's Consideration of Requested Study Modifications and New Studies Included in NOI and PAD Comment Letters

Tables 1.4-3, 1.4-4, 1.4-5, and 1.4-6 list the study modifications and new studies requested in the SBNF, SWRCB, CDFW, and SMBMI letters, respectively, and how the requests were addressed in the relicensing studies performed by DWR.

Table 1.4-3. SBNF-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
REQUESTED MODIFICATION TO DWR PROPOSED STUDIES IN ITS PAD		
None.		
REQUESTED NEW STUDIES		
Water Quality	SBNF requested DWR collect water quality samples upstream and downstream of Silverwood Lake in two years.	Adopted with Modification: DWR adopted portions of SBNF's requested study. The Project has no nexus to water quality upstream of the Project because the Project does not impound, divert, or add to flows upstream of the Project. With regard to downstream of the Project, the Project does not affect flow downstream of the Project because the Project does not use natural flow – all natural inflow into Silverwood Lake is released into the West Fork Mojave River consistent with water supply agreements and water rights consistent with the Mojave River decree (see Exhibit B). However, to augment existing information, DWR added a Water Quality and Temperature Study to its relicensing studies.

Table 1.4-3. SBNF-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Channel Morphology	SBNF requested DWR collect USFS Stream Condition Inventory data upstream and downstream of Silverwood Lake.	Not Adopted: DWR did not perform SBNF's requested study. The Project has no nexus to channel morphology upstream of the Project because the Project does not impound, divert or add to flows or sediment upstream of the Project. With regard to downstream of the Project, the Project does not affect flow downstream of the Project, as described above.
Hydrologic Alteration / Flow Regime	SBNF requested DWR utilize the processes described in Jackson et al (1989) and Muller and Fogg (1999), supplemented by CDFW's Standard Operating procedures and CDFW (2016), upstream and downstream of Silverwood Lake to develop recommended flows releases and management measures.	Not Adopted: DWR did not perform SBNF's requested study. The Project has no nexus to flow upstream of the Project because the Project does not impound, divert or add to flows upstream of the Project. The Project does not affect natural flow downstream of the Project as described above.
Groundwater	SBNF requested DWR assess Project effects on groundwater in a six-step study.	Not Adopted: DWR did not perform SBNF's requested study because the SBNF provided no evidence or reason to suspect that the Project adversely affects groundwater, and an applicant for new license does not have a duty to conduct studies to determine if a problem exists.

Table 1.4-3. SBNF-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Aquatic Invasive and Non-Native Species	SBNF requested DWR perform a study of AIS and non-native invasive species within the proposed Project boundary, along Project-affected stream reaches, and within two miles of Project dams. The study would include an initial reconnaissance and site selection followed by focused surveys. SBNF identified 10 target animal species and seven target plant species.	Adopted with Modification: DWR developed a study within the proposed Project boundary at Silverwood Lake for AIS. All of the SBNF's target plant species were included, as well as all of their list of target animal species, except fish. DWR did not adopt USFS' request for AIS surveys in stream reaches within two miles of the Project for two reasons. First, USFS provides no indication that there are Project-related AIS impacts in stream reaches two miles away from the Project, so the need for the information has not been established. Second, USFS does not describe the nexus to the Project. There is no Project O&M in tributaries two miles upstream or downstream of the Project; therefore, Project O&M would not introduce AIS in these upstream tributaries. DWR performed plant surveys throughout Silverwood Lake, so no specific site selection was necessary. AIS invertebrates were surveyed for at sites with proper habitat and/or a higher likelihood of introduction, which did not require further consultation/coordination. Finally, DWR did not survey for fish species, as those that were targeted by USFS were either already known to be present in Silverwood Lake (CDFW stocks rainbow trout and brown trout, for example) and/or are not considered AIS, although they are non-native, per the definition used for the study. Therefore, collecting information on these species would not be useful in the development of PM&E measures.

Table 1.4-3. SBNF-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Wildlife Sensitive Species – Bats	SBNF requested DWR perform a study of special-status bats within the proposed Project boundary, especially at Project facilities, along Project-affected stream reaches, within 1 mile of Project dams onto NFS lands, and in suitable bat structures within three miles of Project facilities on NFS lands. The study would include an initial reconnaissance and site selection followed by focused surveys, which would include acoustic sampling and mist nets. SBNF identified nine target bat species.	Not Adopted. DWR's proposed study would provide adequate information at no additional cost compared to the study requested. USFS' requested study methods would include reconnaissance of all potential and known roost sites at Project facilities and known roost sites within the existingexisting Project boundary, as well as within three miles of Project facilities followed by mist-netting, acoustic sampling and long-term acoustic monitoring at all sites with signs of bat activity. The cost to complete the study is estimated to be between $50,000 and $70,000. The Licensee's proposed study, which would gather information on all special-status terrestrial wildlife species, would provide adequate information regarding bats at no additional cost.
Wildlife: ESA Species	SBNF requested DWR perform a study of ESA-listed and CESA-listed species in the proposed Project boundary and along Project-affected stream reaches, with a 1-mile buffer. The study would include an initial reconnaissance and site selection followed by focused surveys, which follow "established protocols." SBNF identified 1 target ESA-listed species and four species listed only under the CESA.	Adopted with Modification: DWR adopted portions of the SBNF's requested study in its studies addressing southwestern willow flycatcher, least Bell's vireo, ESA-listed plants, and special-status terrestrial wildlife species. DWR did not perform surveys for species that are not foreseeably affected by the Project and for which a study would not meaningfully inform development of license conditions. DWR did not perform its studies downstream of the Project, where the Project does not affect natural flows, as described above. Inclusion of areas within 1 mile of the Project but outside the proposed Project boundary and areas upstream of the Project are not justified by potential for Project effects, nor was the need for a 500-foot buffer explained.

Table 1.4-3. SBNF-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
USFS Sensitive and CDFW Species of Special Concern	SBNF requested DWR perform a study of FSS and other special-status species within the proposed Project boundary and along Project-affected stream reaches, with a 1-mile buffer. The study would include an initial reconnaissance and site selection followed by focused surveys, which follow "established protocols." SBNF identified 19 target species.	Adopted with Modification: DWR adopted portions of SBNF's study request, including special-status plant surveys. Surveys did not extend to a 1-mile buffer, because potential Project effects would not extend this far out. Field surveys were systematic and covered the entirety of the Project area, except in areas that could not be safely accessed. DWR did not perform protocol level surveys for wildlife species. Many of the listed species do not have established protocols. Additionally, DWR's Terrestrial Wildlife Species – California Wildlife Habitat Relationship Study assessed habitat for special-status species with the potential to be affected by Project O&M which is sufficient for compiling the Project-related information needed to develop license measures. Additionally, DWR did not perform the study one mile away from the Project because DWR performs no O&M one mile away from the Project. Therefore, the information will not inform license requirements.
Terrestrial Invasive Species	SBNF requested DWR perform a study of FSS and other special-status species within the proposed Project boundary and along Project-affected stream reaches, with a 1-mile buffer. The study would include systematic invasive plant surveys. SBNF identified 75 target species.	Adopted with Modification: DWR adopted portions of SBNF's study request. Surveys did not extend to a 1-mile buffer, because potential Project effects would not extend this far out. Field surveys were systematic and covered the entirety of the Project area, except in areas that could not be safely accessed.

Table 1.4-3. SBNF-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Wildlife: Large Mammal Movement	SBNF requested DWR perform a study of FSS and other special-status species within the proposed Project boundary and along Project-affected stream reaches, and a 5-mile buffer. The study would include site selection and a desktop analysis of potential barriers followed by field assessments. SBNF provided dimensions for assessing wildlife crossing points.	Not Adopted: DWR did not perform field assessments of wildlife barriers. Only the 1.3-mile parallel penstocks, which run from the south portal to the Devil Canyon Powerplant, have the potential to constrain wildlife movement. DWR did not adopt CDFW's request to evaluate campgrounds, roads, and drinking sites within five miles of the Project area, because these facilities do not impede movement of large mammals and additional information will not help inform license requirements. Additionally, there are no Project facilities outside of the proposed Project boundary, so there is no Project nexus for any analysis outside of the boundary.
Wildlife Raptor Species	SBNF requested DWR perform a study of raptors within the proposed Project boundary, and a 5-mile buffer. The study would include site selection and surveys using "established protocols." SBNF identified seven target species.	Adopted with Modification: DWR did not perform protocol level surveys for wildlife species. Some of the listed species do not have established protocols. Additionally, DWR's Terrestrial Wildlife Species – California Wildlife Habitat Relationship Study assessed habitat for special-status species with the potential to be affected by Project O&M, which is sufficient for compiling the Project-related information needed to develop license measures. Additionally, DWR did not perform the study five miles away from the Project because DWR performs no O&M 5 miles away from the Project. Therefore, the information will not inform license requirements.
Assess the Health and Safety of Recreationists and USFS Resources in Project Area	SBNF requested DWR perform a study on NFS lands along State Highway 138 that runs parallel to Silverwood Lake and on adjacent Project-affected areas due to overflow. Study methods would be developed in consultation with SBNF.	Adopted with Modification: As part of the recreation condition assessment and carrying capacity analysis, DWR adopted the intent of this study in terms of identifying potential obvious litter and sanitation problems at the Project and also identifying public safety features as part of the inventory and study.

Table 1.4-3. SBNF-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Access Management / Traffic Impacts Study for Roads and Trails in the Project Area	SBNF requested DWR perform a study on roads and trails on NFS lands that provide access or adjacent to the Project. Study methods would include traffic volume counts and parking surveys.	Adopted with Modification: DWR adopted portions of SBNF's requested study. The recreation study inventoried the condition and presence of parking areas, spur roads at developed recreation sites, and trails and sidewalks at each facility.
Assess Projected Recreation Use and Demand in the Project Area	SBNF requested DWR perform a study on NFS lands along State Highway 138 and within a half-mile of the roads that lead directly to the highway. Study methods would be developed in consultation with SBNF.	Adopted with Modification: DWR adopted portions of SBNF's requested study. The recreation study did undertake a use and demand analysis, including the review of research publications and existing demand studies for the region to identify recreation needs now and in the future. The study also included interviews with recreation providers to identify recreation user and potential user needs and demands.
Assess Recreation Carrying Capacity of the Project Area	SBNF requested DWR perform a dispersed and developed recreation survey in Project area and where recreation overflows onto NFS lands. Study methods would be developed in consultation with SBNF.	Adopted with Modification: DWR adopted portions of SBNF's requested study. The recreation study included a study component to evaluate three types of carrying capacity considerations – ecological/biophysical aspects, management or facility aspects (physical) and social aspects as derived from recreation managers and provider interviews or other published information regarding recreation use at Silverwood Lake SRA.

Table 1.4-3. SBNF-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Assess Fire-Hazards from Project-Induced Recreation	SBNF requested DWR perform a fire hazard survey on NFS lands within a quarter-mile of Silverwood Lake and other areas. Study methods would include collecting recreation use data, fire history data, and fuel loadings and profiles. Methods would also include modeling fire behavior.	Adopted with Modification: DWR adopted portions of SBNF's requested study. Fire hazards are known to exist in the Project area and DWR has included in its license application a fire prevention and response plan to address coordination and management of fire response actions and needs.

Key:
AIS = Aquatic Invasive Species
CDFW = California Department of Fish and Wildlife
CESA = California Endangered Species Act
DWR = California Department of Water Resources
ESA = Endangered Species Act
FSS = Listed as Sensitive by the U.S. Department of Agriculture, Forest Service
NFS = National Forest Service
O&M = operations and maintenance
PAD = Pre-Application Document
PM&E = Protection, Mitigation, and Enhancement
SBNF = San Bernardino National Forest
SRA = State Recreation Area
USFS = U.S. Department of Agriculture, Forest Service

Table 1.4-4. SWRCB-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
REQUESTED MODIFICATIONS TO DWR PROPOSED STUDIES IN ITS PAD		
None.		
REQUESTED NEW STUDIES		
Water Balance / Operations Model	SWRCB requested DWR develop a water balance and operations model that simulates current and future Project operations over a range of conditions. The model platform would be developed in consultation with Relicensing Participants. The model would be used so the SWRCB could better understand the magnitude, duration and timing of releases from Cedar Springs Dam to the West Fork Mojave River.	Not Adopted: DWR did not perform SWRCB's requested study. The Project does not affect flow downstream of the Project because the Project does not use natural flow as described above. Therefore, the model would not inform license requirements.
Water Temperature Model	SWRCB requested DWR develop a water temperature model of Silverwood Lake and the West Fork Mojave River. The model platform would be developed in consultation with Relicensing Participants.	Not Adopted: DWR did not perform SWRCB's requested study. The Project does not affect flow downstream of the Project because the Project does not use natural flow as described above. Therefore, the model would not inform license requirements.
Hydrologic Alteration / Flow Regime	SWRCB requested DWR collect data consistent with CDFW's Instream Flow Program's SOP and QA/QC documents from both upstream and downstream of the Project.	Not Adopted: DWR did not perform SWRCB's requested study. The Project has no nexus to stream conditions upstream of the Project because the Project does not impound, divert or add to flows upstream of the Project. With regard to downstream of the Project, the Project does not affect flow downstream of the Project as described above.

Table 1.4-4. SWRCB-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Water Quality Assessment	SWRCB requested DWR collect water quality samples in Silverwood Lake and the West Fork Mojave River for two years. The water quality parameters to be measured, sampling locations and sampling protocols would be developed in consultation the SWRCB and Relicensing Participants.	Adopted with Modification: DWR did not perform SWRCB's requested study. The Project does not affect flow downstream of the Project because the Project does not use natural flow as described above. However, to augment existing information, DWR added a Water Quality and Temperature Study. The study included collecting water quality samples at locations and depths within Silverwood Lake that were consistent with SWRCB's request. Further, DWR's study included most of the water quality parameters requested by the SWRCB (DWR's study did not include total coliform, fecal coliform, *Escherichia coli*, total petroleum hydrocarbons, and grease). DWR also collected quarterly reservoir profiles in Silverwood Lake as part of the study.
Bioaccumulation	SWRCB requested DWR collect fish in Silverwood Lake and analyze them for bioaccumulation following current EPA methods. Field methods and protocols would be developed in consultation with Relicensing Participants. The information would be used by OEHHA regarding 2013 health advisory notifications.	Not Adopted: DWR did not perform SWRCB's requested study because the SWRCB provided no evidence or reason to suspect that the Project causes the bioaccumulation of contaminants, and an applicant for new license does not have a duty to conduct studies to determine if a problem exists. Further, the SWRCB provided no evidence to suspect that the data used by OEHHA to establish fish consumption guidelines for Silverwood Lake in 2013 are no longer adequate.
Channel Morphology Assessment	SWRCB requested DWR collect USFS Stream Condition Inventory data and States Surface Water Ambient Monitoring Program data in the West Fork Mojave River downstream of Cedar Springs Dam. Sampling sites would be selected in consultation with Relicensing Participants.	Not Adopted: DWR did not perform SWRCB's requested study. The Project does not affect flow downstream of the Project because the Project does not use natural flow as described above.

Table 1.4-4. SWRCB-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Special Status Species	SWRCB requested DWR collect data regarding special-status species within the proposed Project boundary and along Project-affected stream reaches. Study methodology would be developed in consultation with Relicensing Participants.	Adopted with Modification: Not adopted: DWR did not adopt the SWRCB's requested study, which focused primarily on fish species because there are no special-status fish in Silverwood Lake. As shown in the PAD and this license application, there have been over 15 species of fish documented in Silverwood Lake and all of them are non-native. As discussed in this license application, the only native fish species in the Mojave River drainage is the Mojave tui chub which has not been observed in the river in many years. Based on available data presented in the PAD and this license application, the fish community in the West Fork Mojave River below Cedar Springs Dam also consists of entirely non-native fish. Further, the details of SWRCB's "special status species study" appear to be more similar to a reservoir or stream based fish population survey. While similar studies are sometimes conducted during relicensing, it is not needed for this Project due to the large amount of data collected by CDFW between 1999 and 2018. Those data are presented in this license application.
Fish Entrainment	SWRCB requested DWR assess the risk for fish to be entrained at Cedar Springs Dam intakes. The methods would include comparing the estimated swim speed of fish that may be near the intakes to the calculated intake approach velocities.	Adopted: DWR performed a desk top Entrainment Risk Study.

Table 1.4-4. SWRCB-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Benthic Macroinvertebrates	SWRCB requested DWR collect and analyze BMI data using the State's SWAMP at 11 transects in the West Fork Mojave River downstream of Cedar Springs Dam. Sampling sites would be selected in consultation with Relicensing Participants.	Not Adopted: DWR did not perform SWRCB's requested study. The Project does not affect flow downstream of the Project because the Project does not use natural flow as described above.

Key:
BMI = benthic macroinvertebrate
CDFW = California Department of Fish and Wildlife
DWR = California Department of Water Resources
EPA = U.S. Environmental Protection Agency
OEHHA = California Office of Environmental Health Hazard Assessment
PAD = Pre-Application Document
QA/QC = quality assurance/quality control
SOP = Standard Operating Procedure
SWAMP = Surface Water Ambient Monitoring Protocol
SWRCB = State Water Resources Control Board
USFS = U.S. Department of Agriculture, Forest Service

Table 1.4-5. CDFW-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
REQUESTED MODIFICATIONS TO DWR PROPOSED STUDY IN ITS PAD		
Aquatic Invasive Species	CDFW requested the following modifications to DWR's proposed study: (1) expand study area to include all tributaries to Silverwood Lake and the West Fork Mojave River downstream of Cedar Springs Dam to Grass Valley Creek; (2) clarify the survey protocol; (3) survey once per month from May through September over two years and describe survey locations; (4) clarify if the study will develop PM&E measures; and (5) record incidental observations on non-native amphibians and reptiles.	Adopted with Modification: DWR developed an AIS study within the proposed Project boundary at Silverwood Lake, which included a detailed description of the protocol, will be used to develop PM&E measures, and included incidental observations of AIS not specifically surveyed for. DWR did not adopt the CDFW's request for AIS surveys in all tributaries to Silverwood Lake and the West Fork Mojave River downstream of Cedar Springs Dam to Grass Valley Creek of the Project for two reasons. First, CDFW provides no indication that there are Project-related AIS impacts in stream reaches two miles away from the Project, so the need for the information has not been established. Second, CDFW does not describe the nexus to the Project. There is no Project O&M in tributaries upstream or downstream of the Project; therefore, Project O&M would not introduce AIS in these tributaries. The single survey was intended to provide a snapshot of AIS present in the reservoir to lead PM&E development, particularly for those species not already known to be present. Performing additional years of study could potentially find more species but would not substantially inform the development of PM&E measures.
Botanical Resources	CDFW requested the following modifications to DWR's proposed study: (1) expand study area to include West Fork Mojave River downstream of Cedar Springs Dam to Deep Creek; and (2) perform systematic field surveys over the entire study area.	Adopted with Modification: DWR performed systematic field surveys over the entire study area, including a 100-foot buffer. DWR did not expand the study area to include West Fork Mojave River downstream of Cedar Springs Dam because the Project does not affect downstream flow, and botanical resources in this area are not anticipated to be affected by Project operation.

Table 1.4-5. CDFW-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Non-Native Invasive Plants	CDFW requested the following modifications to DWR's proposed study: (1) expand the study area to include West Fork Mojave River downstream of Cedar Springs Dam to Deep Creek; and (2) perform systematic field surveys over the entire study area.	Adopted with Modification: DWR performed systematic field surveys over the entire study area, including a 100-foot buffer. DWR did not expand the study area to include West Fork Mojave River downstream of Cedar Springs Dam because the Project does not affect downstream flow, and NNIP are not anticipated to be introduced into, or if occurring downstream, are not anticipated to be affected by, Project operation.
Special-Status Terrestrial Wildlife Species	CDFW requested the following modifications to DWR's proposed study: perform focused surveys for at least bald eagle, peregrine falcon, and bats.	Adopted with Modification: DWR did not perform protocol level surveys for wildlife species. Additionally, DWR's Terrestrial Wildlife Species – California Wildlife Habitat Relationship Study assessed habitat for special-status species with the potential to be affected by Project O&M, which is sufficient for compiling the Project-related information needed to develop license measures.
ESA-Listed Bird Species – Southwestern Willow Flycatcher and Least Bell's Vireo Riparian Habitat Evaluations and Surveys	CDFW requested the following modifications to DWR's proposed study: (1) expand study area to include West Fork Mojave River downstream of Cedar Springs Dam to Deep Creek; (2) include a 500-foot buffer on the survey area; and (3) clarify that "potentially affected" survey areas include areas of both direct and indirect effects.	Adopted with Modification: DWR performed surveys for southwestern willow flycatcher and least Bell's vireo in potentially suitable habitat within the proposed Project boundary, except for the area over the subterranean San Bernardino Tunnel. Surveys were not performed along the West Fork Mojave River downstream of Cedar Springs Dam to Deep Creek, because the Project does not affect natural flows downstream of the Project as described above. The need for a 500-foot buffer was not justified.

Table 1.4-5. CDFW-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
ESA-Listed Plants	CDFW requested the following modifications to DWR's proposed study: (1) expand the study area to include West Fork Mojave River downstream of Cedar Springs Dam to Deep Creek; and (2) perform systematic field surveys over the entire study area.	Adopted with Modification: DWR performed surveys for ESA-listed plants and other botanical resources systematically throughout the study area (i.e., within the proposed Project boundary). Surveys were not performed along the West Fork Mojave River downstream of Cedar Springs Dam to Deep Creek, because the Project does not affect natural flows downstream of the Project as described above.
REQUESTED NEW STUDIES		
Instream Flow Habitat	CDFW requested DWR perform an instream flow study in the West Fork Mojave River downstream of Cedar Springs Dam. The methods would be selected in consultation with Relicensing Participants.	Not Adopted: DWR did not perform CDFW's requested study. The Project does not affect flow downstream of the Project because the Project does not use natural flow as described above. Therefore, the requested study would provide no useful information.
Water Quality	CDFW requested DWR collect water quality samples in Silverwood Lake, in tributaries to Silverwood Lake and the West Fork Mojave River. CDFW did not describe which parameters would be measured, and stated that sampling methods would be the same as those currently used by DWR in Silverwood Lake.	Adopted with Modification: DWR adopted portions of CDFW's requested study. The Project has no nexus to water quality upstream of the Project because the Project does not use natural flow, as described above. However, to augment existing information, DWR added a Water Quality and Temperature Study to its relicensing studies.
Special-Status Aquatic Species	CDFW requested DWR perform surveys for arroyo toad and CRLF in tributaries to Silverwood Lake and in the West Fork Mojave River from Cedar Springs Dam to Deep Creek. Methods would follow USFWS established protocols.	Not Adopted: DWR did not perform CDFW's requested study, which would not inform license requirements. The Project does not impound, divert or add to flows in tributaries of Silverwood Lake upstream of the Project, nor does the Project affect flow in the West Fork Mojave River downstream of the Project, as described above. CDFW provided no information to indicate that arroyo toad occurs in tributaries to Silverwood Lake, which are considered by USFWS to be insufficient habitat to support populations.

Table 1.4-5. CDFW-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Tributary Fish	CDFW requested DWR perform electrofishing surveys in tributaries to Silverwood Lake and in the West Fork Mojave River from Cedar Springs Dam to Deep Creek each quarter. Methods would follow CDFW for three-pass depletion and include identification of potential fish spawning habitat.	Not Adopted: DWR did not perform CDFW's requested study. The Project has no nexus to stream fish upstream of the Project because the Project does not impound, divert or add to flows upstream of the Project. With regard to downstream of the Project, the Project does not affect flow downstream, as described above.
Entrainment	CDFW requested DWR conduct a fish entrainment study. The study would include the following: (1) examine existing intake drawings and date to describe approach velocities; (2) describe location of intakes in relation to depth, proximity to shoreline, and habitat; (3) describe fish species in Silverwood Lake, including potential to use similar habitats and depths as intakes; (4) compare estimated swim speed of fish that may be near the intakes to the estimated intake approach velocities; and (5) conduct quarterly fish sampling of Devil Canyon Powerplant using nets.	Not Adopted: DWR performed a desktop Entrainment Risk Study.

Table 1.4-5. CDFW-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Fish Microhabitat Assessment	CDFW requested DWR assess the condition of fish microhabitat mitigation placed by DWR in Silverwood Lake. The methods would include assessment via underwater camera.	Not Adopted: DWR did not adopt CDFW's requested study because it is not needed. As stated by CDFW staff in various reports regarding the fish population in Silverwood Lake, the fish community is healthy and robust. Regular fish sampling by CDFW shows multiple game fish species each with a well-represented and diverse size class present. In order for this distribution of self-sustaining size classes to exist, especially among species not regularly stocked in Silverwood Lake (e.g., largemouth bass), there must be a successful naturally reproducing population. The existence of this successful fish community infers the presence of adequate habitat for all life stages.
Benthic Macroinvertebrate	CDFW requested DWR collect and analyze BMI data in spring and summer using the SWAMP in tributaries to Silverwood Lake and in the West Fork Mojave River downstream of Cedar Springs Dam to Deep Creek. Nine sampling sites would be selected in consultation with Relicensing Participants.	Not Adopted: DWR did not perform CDFW's requested study. The Project has no nexus to BMI upstream of the Project because the Project does not impound, divert or add to flows upstream of the Project. With regard to downstream of the Project, the Project does not affect flow downstream of the Project, as described above.
Bald Eagle	CDFW requested DWR perform one full year of nesting, wintering, and night roost surveys of bald eagles within the proposed Project boundary, and a half-mile buffer. The methods would follow CDFW (2010) and Jackman and Jenkens (2004). Information regarding osprey nesting would also be collected.	Adopted with Modification: DWR did not perform protocol-level surveys for wildlife species. Additionally, DWR's Terrestrial Wildlife Species – California Wildlife Habitat Relationship Study assessed habitat for special-status species with the potential to be affected by Project O&M, which is sufficient for compiling the Project-related information needed to develop license measures.

Table 1.4-5. CDFW-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Peregrine Falcon	CDFW requested DWR perform one full year of nesting surveys of peregrine falcon within the proposed Project boundary, and a half-mile buffer. The methods would follow Pagel (1992).	Adopted with Modification: DWR did not perform protocol level surveys for wildlife species. Additionally, DWR's Terrestrial Wildlife Species – California Wildlife Habitat Relationship Study assessed habitat for special-status species with the potential to be affected by Project O&M which is sufficient for compiling the Project-related information needed to develop license measures.
Special-status Bats	CDFW requested DWR perform a study of special-status bats at all Project facilities that may be used by bats. The study would include an initial reconnaissance and site selection followed by focused acoustic sampling.	Adopted with Modification: DWR did not perform protocol level surveys for wildlife species. Additionally, DWR's Terrestrial Wildlife Species – California Wildlife Habitat Relationship Study assessed habitat for special-status species with the potential to be affected by Project O&M which is sufficient for compiling the Project-related information needed to develop license measures.

Key:
AIS = Aquatic Invasive Species
BMI = benthic macroinvertebrate
CDFW = California Department of Fish and Wildlife
CRLF = California red-legged frog
DWR = California Department of Water Resources
ESA = Endangered Species Act
NNIP = non-native invasive plant
O&M = operation and maintenance
PAD = Pre-Application Document
PM&E = Protection, Mitigation, and Enhancement
SWAMP = Surface Water Ambient Monitoring Protocol
USFWS = U.S. Fish and Wildlife Service

Table 1.4-6. SMBMI-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
REQUESTED MODIFICATIONS TO DWR PROPOSED STUDY IN ITS PAD		
Botanical Resources	SMBMI requested that plants of importance and use to SMBMI be recorded in the field and reported.	Adopted with Modification: All plant species observed in the field were recorded, and those of importance to SMBMI were reported.

Table 1.4-6. SMBMI-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
Cultural Resources and Tribal Resources	SMBMI requested the following modifications to DWR's Cultural and Tribal resources studies: (1) include a half-mile-wide buffer around the Project APE for background research examination; (2) include information from ethnographic sources; (3) add a caveat that the SMBMI does not agree that Uto-Aztecans did not live in the Mojave Desert region until 5,000 years ago and did not expand into California until 3,900 years Before Present; (4) reference SMBMI's recently-provided ancestral territory map; (5) include information regarding the Serrano Village that existed within and in close proximity to the study area; (6) include information regarding inundation of pre-contact archeological sites; (7) resolve the issue regarding P-36-00174 NRHP-eligibility and address other unassessed cultural resources, and that these assessments be shared with SMBMI for review and comment prior to finalization; (8) systematically survey (both surficial and sub-surface investigations) the entire Project area; (9) include contacting SMBMI regarding ethnographic resources, oral histories, and tribal communities prior to developing cultural studies in the future; (10) develop and provide to interested parties a detailed study method; (11) for the Tribal Resources Study specifically, develop, vet by tribes and finalize prior to interviews with tribal members consent documents, interview questions lists, and confidentiality- and intellectual-properties-based protocols.	<u>Not Adopted</u>: (1) The quarter-mile research buffer surrounding the existing larger Project boundary was deemed adequate and appropriate to address all locations of Project operations and maintenance within the APE, which includes the modified reduced Project boundary. DWR is not proposing to construct any new Project facilities outside of the Project boundary. Additional research will be conducted should any new developments or ground-disturbing activities be proposed outside of the Project boundary in the future. <u>Adopted</u>: (2) The Tribal Resources Study Approach included researching ethnographic documentation which has been included in the Tribal Resources Study technical report. (4) SMBMI's map of ancestral territory is referenced in the Cultural and Tribal Resources study reports. (5) A discussion of Serrano villages/sites is included in the Tribal Resources Study technical report and described in the Cultural Resources Study technical report. (6) Inundation of pre-contact sites is discussed in the Cultural Resources Study technical report. (8) In accordance with the Cultural Resources Study, the entirety of the Project APE was systematically surveyed, with the exception of inundated and unsafe locations, and lands covering the San Bernardino Tunnel that were determined to be outside of the APE.

Table 1.4-6. SMBMI-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
		As agreed to with the SMBMI, subsurface exploration was conducted during the survey in locations deemed highly sensitivity for cultural resources where ground visibility was obstructed by vegetation. (9) The HPMP, when approved, will include measures to consult with tribes and land-managing agencies for future cultural resources studies. (10) The Cultural and Tribal Resources study approaches were provided to tribes, land-managing agencies, and other relicensing participants for review and comment prior to implementing the studies. (11) DWR worked closely with participating tribes to develop and finalize appropriate agreements and study approaches prior to initiating the studies. <u>Adopted with Modification</u>: (3) The Cultural Resources Study technical report cultural context was written to not include reference to the time frame for and settlement of Uto-Aztecans in California; the Tribal Resources Study includes the discussion regarding tribal use of the Project lands and surrounding areas. (7) In accordance with the Cultural Resources Study, all cultural resources identified during the study that could be assessed at the survey level were evaluated for the NRHP. Site P-36-0174 requires additional field investigations beyond the scope of the study to assess the site's NRHP eligibility. The site will be addressed under the management measures included in the HPMP and avoided by Project-related activities until such time it is evaluated for the NRHP.

Table 1.4-6. SMBMI-Requested Study Modifications and New Studies, and How DWR Addressed the Requests in Its Relicensing Studies (continued)

Study	Requested Modification to DWR Proposed Study in PAD or New Study	How DWR Addressed the Request
REQUESTED NEW STUDIES		
None.		

Key:
APE = Area of Potential Effects
DWR = California Department of Water Resources
ESA = Endangered Species Act
HPMP = Historic Properties Management Plan
NRHP = National Register of Historic Places
PAD = Pre-Application Document
SMBMI = San Manuel Band of Mission Indians

DWR had additional discussions with the SMBMI and the Morongo Band of Mission Indians regarding DWR's proposed Cultural and Tribal resources studies.

Based on the above, DWR prepared detailed approaches for the following 11 studies:

1. Water Quality and Temperature
2. Aquatic Invasive Species
3. Botanical Resources
4. Non-Native Invasive Plants
5. Special-Status Terrestrial Wildlife Species – California Wildlife Habitat Relationships
6. ESA-Listed Terrestrial Wildlife Species – California Wildlife Habitat Relationships
7. ESA-Listed Bird Species – Southwestern Willow Flycatcher and Least Bell's Vireo Riparian Habitat Evaluations
8. ESA-Listed Plant Species
9. Recreation Facilities Condition and Demand Assessment
10. Cultural Resources
11. Tribal Resources

The detailed study approaches, study summaries, and study data can be found on the relicensing website at http://devil-canyon-project-relicensing.com/studies/. DWR performed the above studies in 2017, 2018, and early 2019. All relicensing studies are complete.

1.4.2.2 Formal Requests for FERC to Resolve a Study Disagreement

To DWR's knowledge, during Second Stage Consultation, no party filed with FERC a formal request, as provided in 18 CFR § 4.38(e)(2), for FERC to resolve a dispute regarding a disagreement as to any matter arising during First Stage Consultation or the need for DWR to conduct a study or gather information.

1.4.2.3 Availability of Relicensing Study Results

In April 2018, DWR posted to its Project relicensing website a summary of the field results and data from DWR's 11 relicensing studies. Relicensing participants were notified of the availability of the data on the website at a meeting held on April 16, 2018. The results of DWR's relicensing studies are incorporated into DWR's Application for New License.

1.4.2.4 Collaborative Development of PM&E Measures

From April 2018 through February 2019, DWR held nine meetings in Loma Linda, California and organized and held four conference calls with Relicensing Participants. The purpose of these meetings and conference calls was to collaboratively develop and agree upon certain PM&E measures that DWR would include in its Draft Application for New License (DLA) and that the Relicensing Participants would support. These meetings and calls were open to all Relicensing Participants. The following Relicensing Participants participated in one or more of the meetings or calls: SBNF, USFWS, NPS, CDFW, DPR, PCTA, San Bernardino County Sheriff's Department, and San Bernardino County Fire Department (SBCFD). The SWRCB participated in the collaborative meetings and calls, but stated that it cannot agree to or take a position on the merits of any PM&E measures before completing its California Environmental Quality Act (CEQA) review of DWR's Proposal.

As a result of these collaborative discussions, DWR and the Relicensing Participants agreed that they will take the following actions per measure provided there is no additional information discovered or changes in project conditions occur:

- DWR will include the agreed-upon PM&E measure unchanged in DWR's DLA and Final License Application (FLA) and DWR will propose no other measures in the DLA or FLA related to the issue;

- SBNF will recommend to the Regional Forester to include the PM&E measure unchanged and will propose no other measures related to the issue in USFS's FPA Section 4(e) conditions and/or 10(a) recommendations (e.g., if the agreed upon condition includes a hazardous materials management plan, the USFS will propose in its FPA 4(e) conditions no other conditions that include measures for the management of hazardous materials);

- USFWS and CDFW will include the PM&E measure unchanged and will propose no other measures related to the issue in their respective Section 10(j) and/or Section 10(a) recommendations;

- NPS and DPR will include the PM&E measure unchanged and will propose no other measures related to the issue in their respective FPA Section 10(a) recommendations;

- Other agencies, PCTA and other stakeholders will propose the PM&E measure unchanged and no other measures related to the issue.

The collaborative group agreed to focus its efforts on the development of eight plans and one measure, which are listed in Table 1.4-7. Based on these good faith collaborative discussions, DWR and the Relicensing Participants listed in Table 1.4-7 reached agreement on five PM&E plans and measures with one or more Relicensing Participants. The PM&E plans and measures are included in Appendix A.

Table 1.4-7. PM&E Plans and Measure on Which DWR and Stakeholders Reached Agreement, Indicated by an "X" in the Respective Cell

PM&E Plan / Measure Included in Appendix A	DWR and Relicensing Participants that Support the PM&E Measure							
	DWR	**SBNF**	**USFWS**	**NPS**	**CDFW**	**DPR**	**NGO**	**SBCFD**
Fire Prevention and Response Plan	X	X						X
Hazardous Materials Management Plan	X	X						X
Visual Resources Management Plan								
Erosion and Sediment Control Plan	X	X						
Transportation System Management Plan	X	X						
Silverwood Lake Fish Stocking Measure	X				X			
Integrated Vegetation Management Plan[1]								
Aquatic Invasive Species Control Plan								
Total	**5**	**4**	**-**	**-**	**1**	**-**	**-**	**2**

Note:
[1]DWR and the Relicensing Participants were not able to complete discussions on the Integrated Vegetation Management Plan. DWR will include a Recreation Management Plan in its FLA. Collaborative discussions will continue with the goal of including final agreed to measures and plans in DWR's Final License Application.
Key:
CDFW = California Department of Fish and Wildlife
DLA = Draft Application for New License
DPR = California Department of Parks and Recreation
DWR = California Department of Water Resources
NGO = non-governmental organization
NPS = U.S. Department of the Interior, National Park Service
PM&E = Protection, Mitigation, and Enhancement
SBCFD = San Bernardino County Fire Department
SBNF = San Bernardino National Forest
USFWS = U.S. Fish and Wildlife Service

Prior to issuance of the DLA, this section was provided to the Relicensing Participants listed in Table 1.4-7 for review and comment, and DWR understands that each Relicensing Participant listed in Table 1.4-7 agrees that this section accurately presents its current position on the PM&E plans and measures listed in Table 1.4-7.

Following issuance of the DLA, DWR will continue to make a good faith effort to reach collaborative agreement on as many PM&E plans and measures as possible with as many Relicensing Participants as possible. DWR will update this table accordingly in its FLA.

1.4.2.5 Distribution of Draft Application for New License

On April 5, 2019, DWR provided to interested agencies, Indian tribes and members of the public a copy of its DLA for 90-day review. The DLA: (1) indicated the type of application DWR expects to file with FERC; (2) responded to comments and recommendations made by resource agencies and Indian tribes during First Stage Consultation or up to the time DWR distributed the DLA; (3) the results of studies and information gathering conducted by DWR; DWR's proposed PM&E measures; and a request for review and written comments regarding the DLA within the 90-day review period. In addition, on the same date, DWR filed a copy of the DLA with FERC.

1.4.2.6 Comments on Draft Application for New License

[Stakeholders – This section is a placeholder in the DLA and will be completed in the FLA. DWR]

1.4.2.7 Attempt to Resolve Disagreements

[Stakeholders – This section is a placeholder in the DLA and will be completed in the FLA. DWR]

1.4.2.8 Filing of Final Application for New License

[Stakeholders – This section is a placeholder in the DLA and will be completed in the FLA. DWR]

1.4.3 Third Stage Consultation

Third Stage Consultation begins when an applicant files its application, and includes the actions FERC will take to process the application (18 CFR § 4.38[d]).

2.0 PROPOSED ACTION AND ALTERNATIVES

This section describes the existing Project (i.e., No-Action Alternative or Environmental Baseline) and DWR's proposed changes to the existing Project (i.e., DWR's Proposal). This section also discusses other action alternatives that were considered but not analyzed in detail in this document.

2.1 DWR'S PROPOSAL

DWR's Proposal is a power recovery project that operates on the southern end of the East Branch of the SWP in the County of San Bernardino, California, between the cities of Hesperia and San Bernardino. The SWP provides southern California with affordable water supply to supplement local resources. DWR's Proposal generates clean hydropower, provides significant public recreation opportunities easily accessible to both visitors to the area and residents of the surrounding communities, and provides environmental benefits.

2.1.1 DWR's Proposal – Project Facilities

DWR proposes no change to existing Project facilities, which include: Cedar Springs Dam and Silverwood Lake; San Bernardino Tunnel; Devil Canyon Powerplant Penstocks and Surge Chamber; Devil Canyon Powerplant and Switchyard; Devil Canyon Afterbay and Devil Canyon Second Afterbay; Silverwood Lake-associated recreation facilities; and appurtenant facilities and features. DPR, on behalf of DWR, maintains and operates the Silverwood Lake-associated Project recreation facilities as part of the Silverwood Lake SRA. Non-Project facilities (e.g., the PCT and DPR administrative facilities) traverse or are located in the Silverwood Lake SRA but are not included in DWR's Proposal. DWR's Proposal does not include any open water conduits, other than the Devil Canyon Cross Channel, or transmission lines. The existing Project facilities are described in Section 2.2.1.

2.1.2 DWR's Proposal – Other Project Facilities

2.1.2.1 Recreation Facilities

DWR does not propose to add to the existing Project any additional recreation facilities, including recreation-related roads and trails.

2.1.2.2 Gages

Table 2.1-1 describes one existing reservoir gage that DWR proposes to add to the Project for the purpose of documenting compliance with conditions in the new license. DWR does not propose to add to the Project any streamflow gages, since DWR does not propose any measures related to streamflow.

Table 2.1-1. Existing Gage DWR Proposes to Include as a Project Facility Under the New License

USGS Gage No.	Gage Name	Purpose of Gage as Related to the Project
10260790	Silverwood Lake, Near Hesperia, CA	Record Silverwood Lake stage

Key:
CA = California
USGS = United States Geological Survey

2.1.2.3 Roads and Trails

Table 2.1-2 describes 10 existing roads that DWR proposes to add to the Project as Primary Project Roads. A Primary Project Road or Trail includes any road or trail that is identified in the license as a Project facility, is used almost exclusively to access the Project, is within the existing Project boundary, and is operated and maintained exclusively by DWR as a Project feature. DWR does not propose to add to the Project any Primary Project Trails. Roads and trails associated with Project recreation facilities are discussed under recreation facilities.

2.1.3 Proposed Project Boundary

DWR proposes to modify the existing Project boundary, which would result in a reduction of the area within the boundary from 3,744.0 acres to 2,079.4 acres, of which 125.9 acres would be NFS lands managed by USFS as part of the SBNF.

2.1.4 Project Operations

DWR proposes no change to existing Project operations. DWR proposes to operate the Project by generating electricity as SWP water is delivered to downstream SWP water users.

Table 2.1-2. List of Existing Roads DWR Proposes to Add to the Project as Primary Project Roads

Designation	Begins	Ends	Land Ownership	Distance (miles)	Purpose
Tunnel Outlet Access Road	Locked Gate on Devils Canyon Road	San Bernardino Tunnel Outlet	City of San Bernardino, State of California, and NFS	2.4	Access to San Bernardino Tunnel Outlet
Surge Chamber Access Road	Tunnel Outlet Access Road	San Bernardino Tunnel Surge Chamber	NFS	0.5	Access to San Bernardino Tunnel Surge Chamber
Upper Penstocks (West) Access Road	San Bernardino Tunnel Outlet	San Bernardino Penstocks	City of San Bernardino, State of California, and NFS	1.1	Access to west side of Upper Portion of Devil Canyon Penstocks
Upper Penstocks (Upper East) Access Road	Tunnel Outlet Access Road	San Bernardino Penstocks	City of San Bernardino and State of California	0.7	Access to east side of Upper Portion of Devil Canyon Penstocks
Upper Penstocks (Lower East) Access Road	Tunnel Outlet Access Road	San Bernardino Penstocks	City of San Bernardino and State of California	0.1	Access to east side of Upper Portion of Devil Canyon Penstocks
Lower Penstocks Access Road	Devil Canyon Powerplant Complex	San Bernardino Penstocks	City of San Bernardino and State of California	0.8	Access to Lower Portion of Devil Canyon Penstocks
Dam and Spillway Access Road	Locked gate	Silverwood Lake	State of California	1.0	Access to Cedar Springs Dam and east side of Cedar Springs Dam Spillway
Dam Downstream Face Access Road	Locked gate	Downstream Face of Cedar Springs Dam	State of California	0.4	Access to downstream face of Cedar Springs Dam
Spillway Access Road	Mojave Power/Pumping Plant Road	Silverwood Lake	State of California	0.3	Access to west side of Cedar Springs Dam Spillway
Intake Access Road	Locked gate	San Bernardino Tunnel Intake	State of California	< 0.1	Access to San Bernardino Tunnel Intake

Key:
< = less than
NFS = National Forest System

2.1.5 Proposed Environmental Measures

DWR proposes for inclusion in the new license the following 11 environmental measures to protect or enhance environmental resources in the proposed Project boundary:

Geology and Soils

- Measure GS1 - Implement the Erosion and Sediment Control Plan included in Appendix A, that includes measures to control sedimentation and erosion when stabilizing slopes are affected by the Project. DWR developed this plan in collaboration with interested parties and understands USFS supports this plan.

Water Resources

- Measure WR1 - Maintain Silverwood Lake minimum pool and limit Silverwood Lake water surface elevations for the benefit of recreation and reservoir fishery. This measure, which is included in Appendix A, incorporates into the new license the Silverwood Lake minimum pool and water surface elevation restrictions in the DWR and USFS 1968 MOU and the DWR and CDFW 2003 MOU, and is substantially consistent with Article 58 in the existing Project license.

- Measure WR2 - Implement the Hazardous Materials Management Plan included in Appendix A, that includes measures to manage hazardous materials, including response and clean-up of hazardous materials spills. DWR developed this plan in collaboration with interested parties and understands USFS and San Bernardino County Fire Department (SBCFD) supports this plan.

Aquatic Resources

- Measure AR1 - Implement the Silverwood Lake Fish Stocking Measure included in Appendix A, that includes measures to maintain the rainbow trout recreational fishery, including periodic angler surveys. This measure is similar to Article 51 in the existing Project license. DWR developed this measure in collaboration with interested parties and understands CDFW supports this measure.

- Measure AR2 - Implement the Aquatic Invasive Species Management Plan included in Appendix A, that includes measures to prevent the introduction and spread of aquatic invasive species.

Terrestrial Resources

- Measure TR1 - Implement the Integrated Vegetation Management Plan included in Appendix A, that includes measures for controlling non-native

plant species, protecting special-status species, and re-vegetating disturbed areas.

Land Use

- Measure LU1 - Implement the Transportation System Management Plan included in Appendix A, that provides guidance for the maintenance of Primary Project Roads and Trails. DWR developed this plan in collaboration with interested parties and understands USFS supports this plan.

- Measure LU2 - Implement the Fire Prevention and Response Plan included in Appendix A, that provides measures for preventing, reporting, and investigating Project-related wildfires. DWR developed this plan in collaboration with interested parties and understands USFS and SBCFD support this plan.

- Measure LU3 - Develop and Implement a Project Safety Plan that provides measures for installing and maintaining signs, lights, sirens and other devices below Cedar Springs Dam needed to protect the public. This measure is similar to Articles 60 and 402 in the existing license.

Aesthetics

- Measure VR1 - Implement the Visual Resources Management Plan included in Appendix A, that includes measures to reduce the visual contrast of some Project facilities.

Cultural Resources

- Measure CR1 - Implement the Historic Properties Management Plan (Priviledged) included in Appendix A, that provides specific actions and processes to manage historic properties.

DWR also intends to include include a Recreation Management Plan (RMP) for the Project in its FLA.

No-Action Alternative (Environmental Baseline)

Under the No-Action Alternative, the Project would continue to operate into the future as it has historically operated under the terms and conditions of the current license. Therefore, under this alternative, there are no changes to existing Project facilities or operations. Furthermore, the inflow to the Project and downstream water demands would remain the same as they have been historically. Under this alternative, no new PM&E measures would be implemented.

A brief description of existing Project facilities follows. Refer to Exhibit A, Project Description, for a more detailed discussion of existing Project facilities.

2.1.6 Existing Project Facilities

2.1.6.1 Cedar Springs Dam and Silverwood Lake

Cedar Springs Dam and Silverwood Lake are located on the West Fork Mojave River, approximately 90 miles southeast of the bifurcation of the East and West branches of the SWP, and 25 miles north of the City of San Bernardino. Completed in 1971, Cedar Springs Dam is a 249-foot-tall, zoned earth and rockfill dam, with a dam crest that is 42 feet wide and 2,230 feet long, at an elevation of 3,378 feet. It contains approximately 7.6 million cubic yards of embankment. At the Normal Maximum Water Surface Elevation (NMWSE) of 3,353 feet, Silverwood Lake has a storage capacity of 73,032 acre-feet (AF), a usable storage capacity of 33,820 AF, normal maximum surface area of 962.0 acres, and a shoreline length of about 13 miles.

The Cedar Springs Dam Spillway is located on the left abutment of the dam and consists of a 120-foot long, un-gated crest with a rectangular lined concrete channel. The Cedar Springs Dam low-level outlet works is located in the left abutment of the dam directly below the spillway. The low-level outlet works consists of an un-gated intake tower, a pressure tunnel connecting the intake tower to a gate chamber, a free-flow tunnel downstream from the gate chamber that discharges into the spillway chute just upstream from the stilling basin, and an air intake that also serves as an emergency exit. The low-level outlet works maximum capacity is 5,000 cubic feet per second (cfs).

2.1.6.2 San Bernardino Tunnel and Penstocks

The San Bernardino tunnel intake is a vertical reinforced concrete tower on the south end of Silverwood Lake that draws water from the reservoir and conveys it into the San Bernardino Tunnel. The tunnel is a pressure conduit, which conveys water from Silverwood Lake to the Devil Canyon Penstocks. The 3.81-mile-long, concrete-lined tunnel is 12.75 feet in diameter and has a design capacity of 2,811 cfs at Silverwood Lake NMWSE.

Water enters the Devil Canyon Powerplant via two surface penstocks. One of the penstocks, which is constructed of steel, is 1.3 miles long, with a diameter varying from 9.5 feet to the south portal (i.e., where the tunnel transitions to a penstock) to 8 feet at the powerplant. The other penstock, constructed of steel, is also 1.3 miles long, and has a diameter varying from 12.5 feet to the south portal to 8 feet to the powerplant. The above-ground penstocks run parallel, generally following the ground slope from the south portal to the Devil Canyon Powerplant. The maximum capacities of the two penstocks at Silverwood Lake NMWSE are approximately 1,200 cfs and 1,600 cfs, respectively.

2.1.6.3 Devil Canyon Powerplant and Switchyard

The Devil Canyon Powerplant is located at the base of the San Bernardino Mountains in the City of San Bernardino and is designed to recover power in electrical form from the

SWP water as it drops from the high desert through the Devil Canyon Powerplant turbines. The elevation drop from Silverwood Lake provides the Devil Canyon Powerplant with a normal static head of 1,406 feet at the NMWSE of Silverwood Lake.

The Devil Canyon Powerplant has four generation units. These include one Baldwin-Lima-Hamilton Pelton-type turbine and one Sulzer Escher Wyss Pelton-type turbine, each with 1,357 feet rated head, 277 revolutions per minute (rpm) runner speed, 81,000 horsepower (hp) rated output, 670 cfs approximate rated discharge, and an installed capacity of 59,850 kilowatts (kW). The other two are Voith Pelton-type turbines, each with 1,250 feet rated head, 277 rpm runner speed, 102,064 hp rated output, 800 cfs approximate rated discharge, and an installed capacity of 76,548 kW.

The Devil Canyon Switchyard includes four step-up transformers. There are multiple current transformers and potential transformers in the switchyard. The ratings of the current transformers and potential transformers, which are part of the interconnected transmission system, are CEII and are provided separately (Single-Line Diagram of the Devil Canyon Powerplant in Appendix A of Exhibit F).

2.1.6.4 Devil Canyon Afterbay Dam and Afterbay

Water from the Devil Canyon Powerplant flows to the off-channel Devil Canyon Afterbay, which has a surface area of four acres at a NMWSE of 1,932 feet, a capacity of 49 AF, and an embankment crest elevation of 1,940 feet. Completed in 1974, the afterbay provides a minimal amount of regulatory capacity for matching the powerplant's inflows and outflows to different pipelines for SWP water deliveries outside of the existing Project boundary.

SWP water is delivered to the Devil Canyon Second Afterbay via the 1,100-foot-long, 40-foot-wide, 27-foot-deep concrete-lined Cross Channel. SWP water scheduled to meet downstream water supply demands is delivered through the following four pipelines: the Rialto Pipeline; Azusa Pipeline; Santa Ana Pipeline; or the San Bernardino Pipeline.

The Devil Canyon Afterbay includes a spillway structure designed for emergency purposes but the spillway has never been used, and is obsolete due to the construction of the Second Afterbay.

Some SWP water is released for consumptive use from the Devil Canyon Afterbay into one of the following pipelines: San Bernardino Valley Municipal Water District's 17-mile-long San Bernardino Pipeline; SWP's 27-mile-long Santa Ana Pipeline; the San Gabriel Valley Municipal Water District's 38-mile-long Azusa Pipeline; and the MWD's 30-mile-long Rialto Pipeline. Each of the pipelines' intakes are from the same intake structure in the southeast corner of the afterbay. The valves, turnouts, meters, and connections for these pipes are not part of the Project facilities.

2.1.6.5 Devil Canyon Second Afterbay Dam and Afterbay

The Devil Canyon Second Afterbay was added to the Project in 1995 to increase the operational flexibility and capacity of the Devil Canyon Powerplant. The Devil Canyon Second Afterbay NMWSE is 1,930 feet, has a gross storage capacity of 960 AF, and a surface area of approximately 36.0 acres. Devil Canyon Second Afterbay is an off-channel, below-original-ground-level water holding structure.

All operational releases from the Devil Canyon Second Afterbay occur through the outlet structure. SWP water can be delivered through the outlet structure via one of three pipelines: MWD's Rialto Pipeline and the SWP's Santa Ana Pipeline, both of which are described above, and the SWP's Inland Feeder, which is a 44-mile-long conveyance system. The valves, turnouts, meters, and connections for these pipes are not part of the Project facilities.

2.1.7 Other Existing Project Facilities

2.1.7.1 Recreation Facilities

Table 2.2-1 lists Project recreational facilities, all of which are located at Silverwood Lake. Public access to the Devil Canyon Afterbay and Second Afterbay is not permitted due to safety concerns.

2.1.7.2 Gages

The existing license does not identify any streamflow or reservoir stage gages for the purpose of complying with streamflow or reservoir elevation requirements.

2.1.7.3 Roads and Trails

The existing license does not identify any Primary Project Roads or Primary Project Trails.

Table 2.2-1. Project Recreation Facilities

Recreational Facility	Description
Rio Group Camp	Group camping facility with 100 person capacity
Barranca Group Camp	Group camping facility with 100 person capacity
Valle Group Camp	Group camping facility with 100 person capacity
Cleghorn Day Use Area	Day use shoreline facility with swim beach and picnicking sites
Cleghorn Boat Launch	Day use facility with boat launch and courtesy dock, restrooms
Garces Overlook	Developed overlook view point
New Mesa Campground	Campground with 42 full hook up individual camping units
Entrance Station	Kiosk entry station for recreationists
Nature Center	2,700-square foot facility for interpretive programs
Mesa Campground	Campground facility with 107 individual camping units
Campfire Center	Outdoor amphitheater for interpretive programs
Sawpit Canyon Picnic Area 3	Day use facility with 57 picnicking units
Sawpit Canyon Picnic Area 2	Day use facility with 45 picnicking units
Sawpit Canyon Picnic Area 1	Day use facility with 10 picnicking units
Sawpit Canyon Day Use Area	Day use shoreline facility with swim beach with multiple picnicking facilities and concessionaire store
Black Oak Picnic Area	Day use facility with 84 picnicking units
Sawpit Canyon Marina	Marina facilities with moorage facilities for 61 boats and concessionaire boat rentals
Sawpit Canyon Boat Launch	7-lane boat launch and courtesy docks
Jamajab Point Overlook	Developed overlook view point
Serrano Landing Day Use Area	Boat-in/hike-in shoreline day use site with picnicking facilities
Miller Canyon Picnic Area	Bike-in/hike-in day use site with 12 picnicking units
Lynx Point Overlook	Developed overlook view point
Devil's Pit Overlook	Developed overlook view point with wooden viewing platform
Miller Canyon Group Camp	Group camping area with 3 sites holding up to 40 persons each
Miller Canyon Trailhead	Developed trail head for accessing all Miller Canyon facilities and shorelines
Sycamore Landing Day Use Area	Boat-in day use site with 13 picnicking units
Live Oak Landing Day Use Area	Boat-in/hike-in day use site with 8 picnicking units
Chamise Day Use Area	Boat-in day use site with 7 picnicking units
Garces Trail	0.4-mile-long trail linking Cleghorn Day Use area to Garces Overlook

Table 2.2-1. Project Recreation Facilities (continued)

Recreational Facility	Description
Miller Canyon Trail	1.6-mile-long gravel surfaced trail linking Miller Canyon Group Camps to the Silverwood Bike Path
East Fork Trail	0.3-mile long asphalt surfaced trail
Silverwood Bike Path	5.6-mile-long paved bike path connecting Serrano Landing Day Use Area in Miller Canyon to Cleghorn Day Use Area on the West end of Silverwood Lake SRA

Source: DWR 2016
Key:
SRA = State Recreation Area

2.1.8 Existing Project Boundary

The existing Project boundary comprises 3,744.0 acres of land. Within the total acreage, 221.0 acres are federal lands managed by USFS as part of the SBNF. Most of these federal lands are located along the west side of Silverwood Lake, San Bernardino Tunnel and Surge Chamber, and Devil Canyon Powerplant Penstock areas.

2.1.9 Existing Project Operation

The existing Project is operated as a power recovery project using SWP water. For that reason, Project operations do not vary based on changes in local hydrological conditions. The Project generates electricity using SWP water as the water is provided for downstream use. The Project's installed capacity is 272,796 kW and the Project's calculated dependable capacity is 250,100 kW. The existing Project generates an average of 836,000 megawatt-hours of power per year.

The Project does not use natural flow into Silverwood Lake for electricity generation, nor does the Project have discretion over releases from Silverwood Lake into the West Fork Mojave River. Releases from Silverwood Lake into the West Fork Mojave River are made in accordance with existing water rights and water delivery agreements that are not related to electricity generation.

See Exhibit B, Project Operations and Resource Utilization, for a detailed description of Project operations, including a discussion of water surface elevation limitations in the 1968 USFS MOU, as amended, and the 2003 CDFW MOU.

2.1.10 Existing Environmental Measures

2.1.10.1 Existing License Requirements

The existing FERC license includes 80 articles, only one of which directly affects Project operations: Article 58 requires DWR to maintain Silverwood Lake surface elevations at the highest, most practicable level commensurate with other Project purposes during the summer recreation season.

2.1.10.2 Measures in Other Existing Licenses, Permits, Agreements, and Contracts that Affect Project Operations

Six agreements, each of which is discussed in Exhibit B, affect DWR's operations of the Project. DWR intends to continue honoring these agreements after issuance of the new license.

2.1.11 Existing Routine Facility Maintenance

2.1.11.1 San Bernardino Tunnel

The San Bernardino Tunnel is always pressurized, except for one to two periods approximately once every five years when the tunnel is dewatered for inspection.

2.1.11.2 Devil Canyon Powerplant Maintenance

DWR conducts annual mechanical and electrical inspections and maintenance at the Devil Canyon Powerhouse to verify the structural and/or functional integrity of the facilities and to identify conditions that might disrupt operations. The annual mechanical and electrical inspections and maintenance of the generation units are typically done one unit at a time and occur in the spring and fall time frame while keeping other units available for water delivery. These annual inspections typically run about 25 days each. In the fall, half of the powerplant is out at a time for 3 days for switchyard inspections and maintenance. Penstock inspections are done individually and usually happen in the late fall or early winter, again affecting half the powerplant at a time and leaving two units available for power generation and water delivery.

2.1.11.3 Other Facility Maintenance

Routine maintenance activities conducted in the vicinity of Project facilities include vegetation management, pest management, road and trail maintenance, maintenance of communication facilities, debris management, and facility painting. Each of these activities is described below.

Vegetation Maintenance

Vegetation management is implemented by DWR at Project facilities. Vegetation management is completed throughout the Project area as necessary to reduce fire hazard, to provide for adequate Project facility access and inspection, to protect Project facilities, and to provide for worker and public health and safety. In general, vegetation management is implemented within approximately 75 feet of the powerhouse and switchyard; within approximately 15 feet on either side of roads and trails to Project facilities; and within and adjacent to recreation areas.

Vegetation management is conducted manually (hand trimming) and chemically (with the use of herbicides). Hand trimming includes cutting grasses and forbs using string trimmers, and removing or trimming overhanging shrubs and tree limbs using a chain

saw or other handheld saw or clippers. These management activities are conducted as needed in conjunction with facility inspections.

Herbicides, in combination with surfactants, are used in combination with hand trimming vegetation management activities on an annual basis at Project facilities located on DWR-owned property. All herbicide applications are supervised by a Qualified Applicator under the direction of a licensed Pest Control Advisor (PCA). The PCA prepares pest control recommendations consistent with the specific herbicide label(s) for each site, prescribing specific application direction and associated precautions that must be strictly followed. All-terrain vehicles, other vehicles (e.g., pick-up trucks), backpack sprayers, or small hand-held sprayers are used to apply herbicides. Herbicide application occurs twice annually, at a minimum. These applications occur between December 1 and March 31, as determined by the PCA for pre-emergents. Follow-up visits to apply post-emergent herbicides and/or additional treatments (as needed) are seasonally dependent, and typically occur between April 1 and June 30. A third cycle, if required, would be completed between July 1 and October 14.

Hazard Trees

Hazard trees – generally defined as dead or dying trees or trees with defects that may result in failure and have the potential to cause property damage, personal injury, or death – are removed as needed. Removal is conducted with a chainsaw, handheld saw, or other equipment. Smaller diameter debris from felled hazard trees is either chipped or lopped and scattered. Downed logs are typically left onsite and are moved only if needed for safety. If moving logs is necessary, it may be completed by hand or machine, depending on the situation.

Vertebrate Pest Management

DWR implements rodent control as needed in facility interiors using non-restricted rodenticides, which are applied in accordance with the label instructions. Rodent control occurs within the Devil Canyon Powerhouse.

Road Maintenance

Regular inspection of the Project access roads occurs during the course of day-to-day Project activities. Road maintenance on Project and shared roads occurs as needed. Maintenance generally includes, but is not limited to, the following types of activities: debris removal; filling potholes; grading, sealing, and surfacing; maintenance or replacement of erosion control features (e.g., culverts, drains, ditches, and water bars); repair, replacement, or installation of access control structures such as posts, cables, rails, gates, and barrier rock; and repair and replacement of signage. Vegetation management may be conducted concurrently with road maintenance.

Facility Painting

DWR paints or recoats the exterior of Project facilities, including the powerhouse and ancillary facilities as needed.

Recreation Facilities Maintenance

Maintenance of recreation facilities is conducted by both DWR and DPR. Maintenance activities include activities to support recreation development and use and include maintaining parking areas, lawns, restrooms, lights, water, power, shelters, and picnic/campground equipment.

2.2 OTHER ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

2.2.1 Federal Government Takeover of the Project

Pursuant to 16 United States Code (U.S.C.) § 828b, Section 14 of the FPA pertaining to the taking over by the United States of any project upon or after the expiration of a license shall not be applicable to any project owned by a State or municipality. The Project is a part of the SWP and, therefore, the Project is not subject to federal takeover.

2.2.2 Issuing a Non-Power License

FERC may issue a non-power license if it finds that, in conformity with a comprehensive plan for improving or developing a waterway, a licensed project should no longer be used for power purposes. A non-power license is a temporary license that FERC would terminate whenever it determines that another governmental agency is authorized and willing to assume regulatory authority and supervision over the lands and facilities covered by the non-power license. At this time, no governmental agency has suggested a willingness or ability to assume such responsibilities. No party has sought a non-power license for the Project, and there is no evidence suggesting that such a license would conform to a comprehensive plan for the waterway. Therefore, a non-power license was not considered a reasonable alternative to relicensing the Project.

2.2.3 Retiring the Project

Decommissioning of the Project could be accomplished with or without dam removal. Either alternative would require denying the relicensing application and surrender or termination of the existing license with appropriate conditions. There would be significant costs involved with decommissioning the Project and/or removing any Project facilities.

The SWP provides southern California with many benefits, including affordable water supply, reliable regional clean energy, opportunities to integrate green energy,

accessible public recreation opportunities, and environmental benefits. With decommissioning, the Project would no longer be authorized to generate power.

No party has suggested Project decommissioning would be appropriate in this case, and there is no basis for recommending it. Therefore, Project decommissioning was not considered a reasonable alternative to relicensing the Project with appropriate environmental enhancement measures.

3.0 GENERAL DESCRIPTION OF THE RIVER BASIN

This section provides a general description of the river basin in which the Project is located. Climate, topography, and major land uses in the Project region are also discussed in this section.

3.1 RIVER BASIN

The Project spans an area from the southerly edge of the Mojave Desert through the western part of the San Bernardino Mountain Range. The Project's Silverwood Lake collects water from two named drainages: the West Fork Mojave River and the East Fork of the West Fork Mojave River. The two other Project impoundments, Devil Canyon Afterbay and Devil Canyon Second Afterbay, are upland reservoirs not built on a natural stream bed, and only hold SWP water passed through the Devil Canyon Powerplant via the San Bernardino Tunnel. The two afterbays do not collect flows from the basin in which they are located and do not discharge into State of California surface waters (Figure 3.1.1).

Flows from West Fork Mojave River and the East Fork of the West Fork Mojave River mix with the SWP water in Silverwood Lake. Flow in both rivers is seasonal (intermittent) in that each river flows during certain times of the year (i.e., primarily from December through May) when smaller upstream stream courses are flowing and when groundwater provides enough water for river flow. Runoff from rainfall or other precipitation supplements the flow.

The West Fork Mojave River originates at an elevation of 4,960 feet on the north side of a saddle between summits on a ridge running west northwest of Sugarpine Mountain. The West Fork Mojave River has no significant diversions or withdrawals upstream of Silverwood Lake. As described in Section 3.1.1.1, at its inflow into Silverwood Lake, the West Fork Mojave River drains an area of 3.2 square miles.

The East Fork of the West Fork Mojave River originates at an elevation of 5,500 feet in Twin Peaks, California. Prior to construction of Cedar Springs Dam, the East Fork of the West Fork Mojave River was a tributary to the West Fork Mojave River. However, today, the West Fork drains directly into Silverwood Lake before draining an area of 11.3 square miles (Section 3.1.1.2). Upstream of Silverwood Lake, the East Fork of the West Fork Mojave River collects water from Houston Creek, which has a small reservoir called Lake Gregory at its headwaters. Lake Gregory Dam was built in 1938 by the Crest Forest County Water District. Today, Lake Gregory serves primarily as a recreation destination that includes a San Bernardino County Regional Park (Lake Gregory Regional Park).

Several unnamed tributaries enter Silverwood Lake. However, none of these tributaries is gaged. Collectively, they drain an area of 19.3 square miles (Section 3.1.1.3).

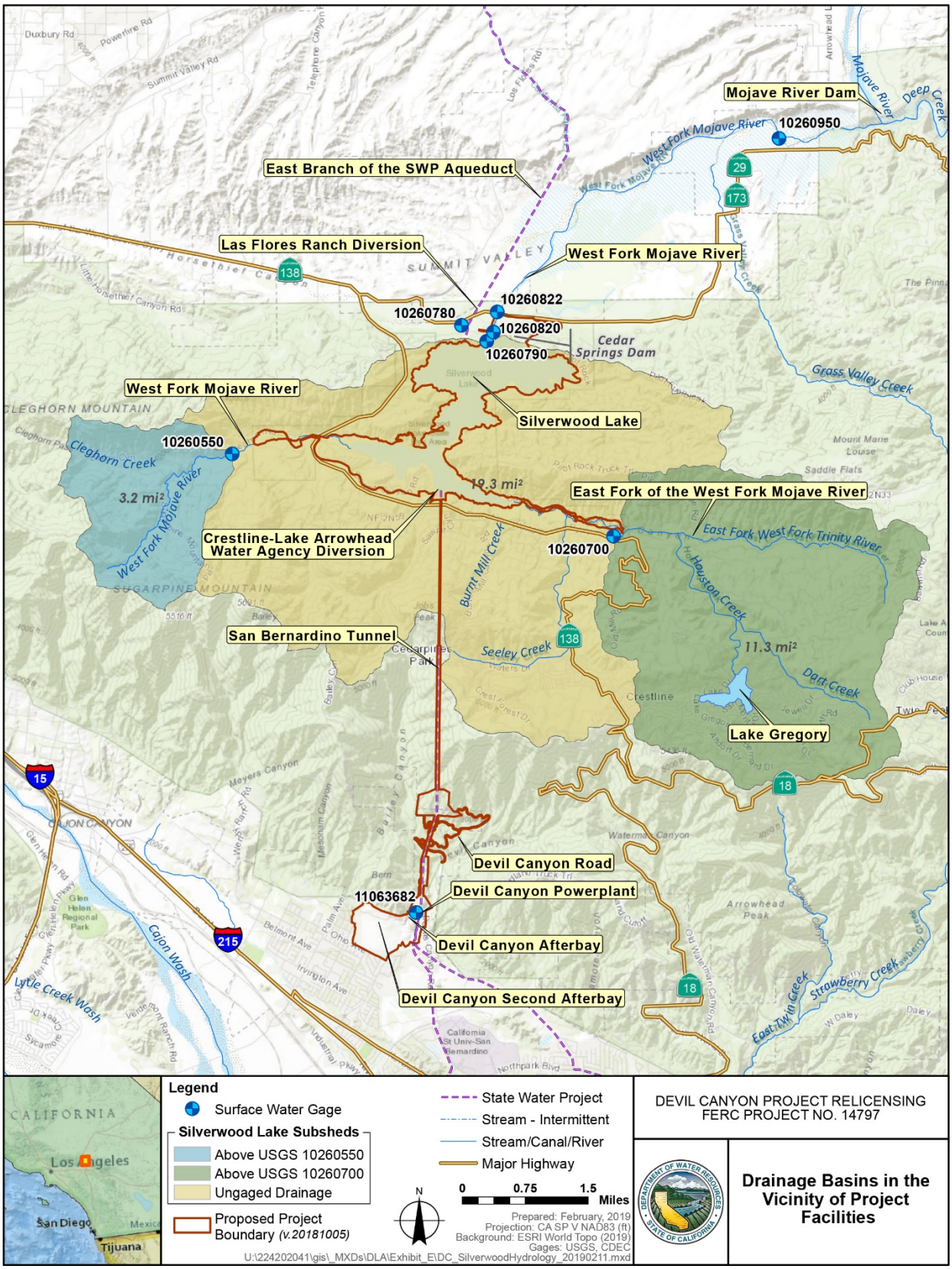


Figure 3.1-1. Drainage Basins in the Vicinity of Project Facilities

Silverwood Lake and Cedar Springs Dam discharge into the West Fork Mojave River, which flows downstream from the dam approximately 4.3 miles to where Grass Valley Creek enters the West Fork Mojave River. Grass Valley Creek has a small private reservoir called Grass Valley Lake, which is located near its headwaters.

From its confluence with Grass Valley Creek, the West Fork Mojave River flows another 2.1 miles to join with Deep Creek to form the Mojave River. The area drained by Grass Valley Creek and the 6.4 miles of West Fork Mojave River downstream from Cedar Springs Dam to Deep Creek is approximately 41 square miles, and consists of both steep mountainous terrain, with elevations that range from 3,000 feet to 6,000 feet, and a long, narrow valley to the west of the West Fork Mojave River.

The sub-basin that is drained by Deep Creek is 135 square miles of rugged mountainous terrain, with elevations that range from 3,000 feet to 8,200 feet. Deep Creek collects water from several tributaries, including Coxey, Holcomb, Willow, and Little Bear Creeks. The privately owned Lake Arrowhead, formed by Lake Arrowhead Dam, is located near the headwaters of Little Bear Creek. The dam was completed in 1922 by Arrowhead Lake Company to create Lake Arrowhead as a resort destination.

Figure 3.1-2 shows the basins contributing to Mojave River flow at the confluence of the West Fork Mojave River and Deep Creek.

The Mojave Forks Dam, which is also known as the Mojave River Dam or West Fork Dam, is located just downstream of the West Fork Mojave River and Deep Creek confluence. The dam is a U.S. Army Corps of Engineers (USACE) flood-control structure completed in 1974 to provide flood protection to the cities located downstream on the Mojave River and can store approximately 179,400 AF of water. The dam is 200 feet high and 2,223 feet long. Because the dam serves strictly for flood control, the reservoir is usually dry; however, it can fill quickly following heavy winter storms. Flood waters are released as quickly as possible without exceeding the capacity of downstream levees. The reservoir is generally drained within two to three days of a flooding event. Because the dam reduces the sharp peaks of flash floods in the Mojave River channel, it also provides incidental groundwater recharge benefits in the Victor Valley area.

From the Mojave Forks Dam, the Mojave River flows north and east through the California cities of Hesperia, Victorville, and Barstow and through the Mojave Desert for approximately 100 miles before terminating into the Mojave River Wash on the western edge of the Mojave National Preserve. River flow is intermittent seasonal, with much of the flow subsurface, except for several bedrock gorges. The Mojave River basin covers approximately 4,600 square miles.

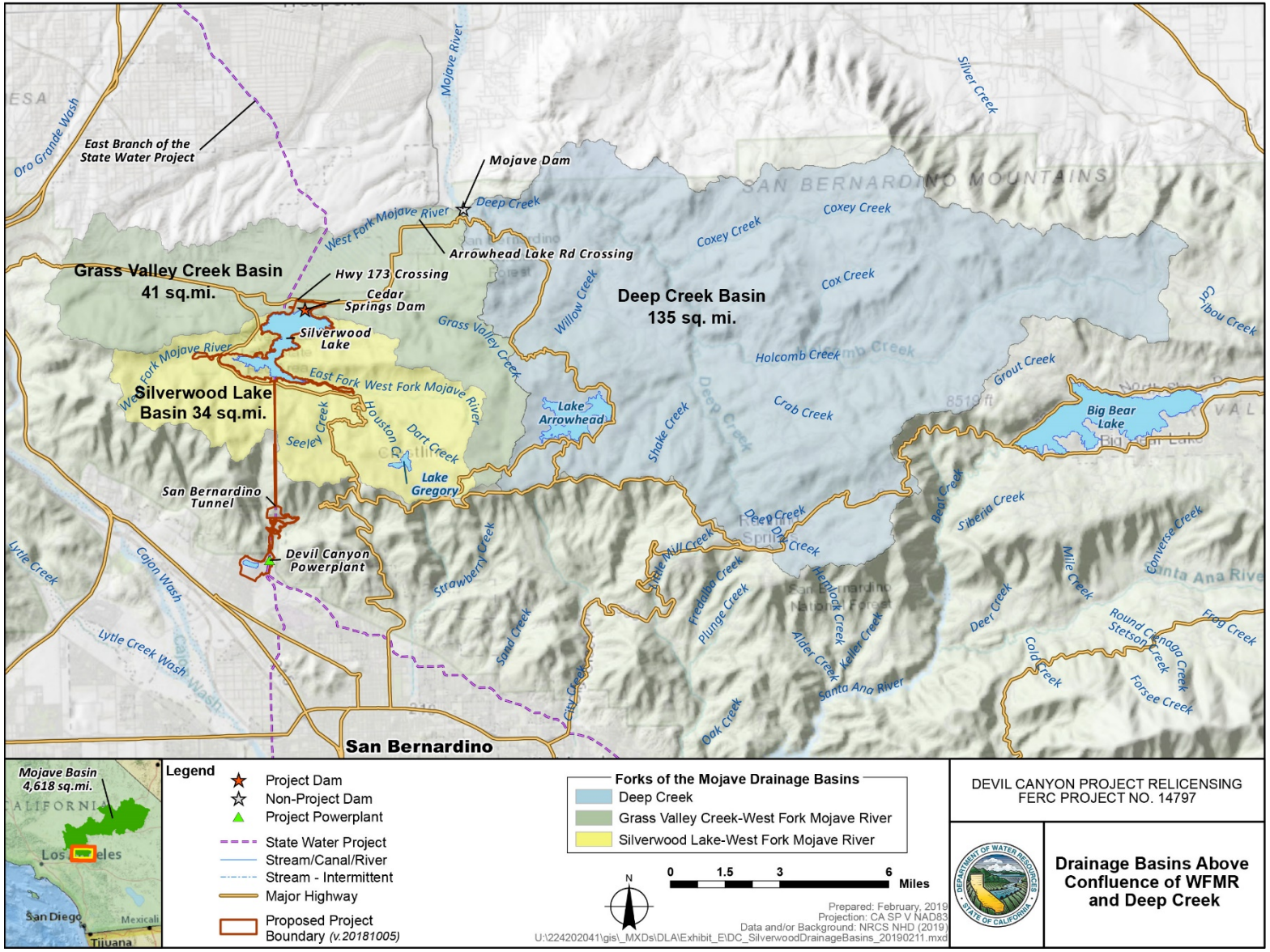
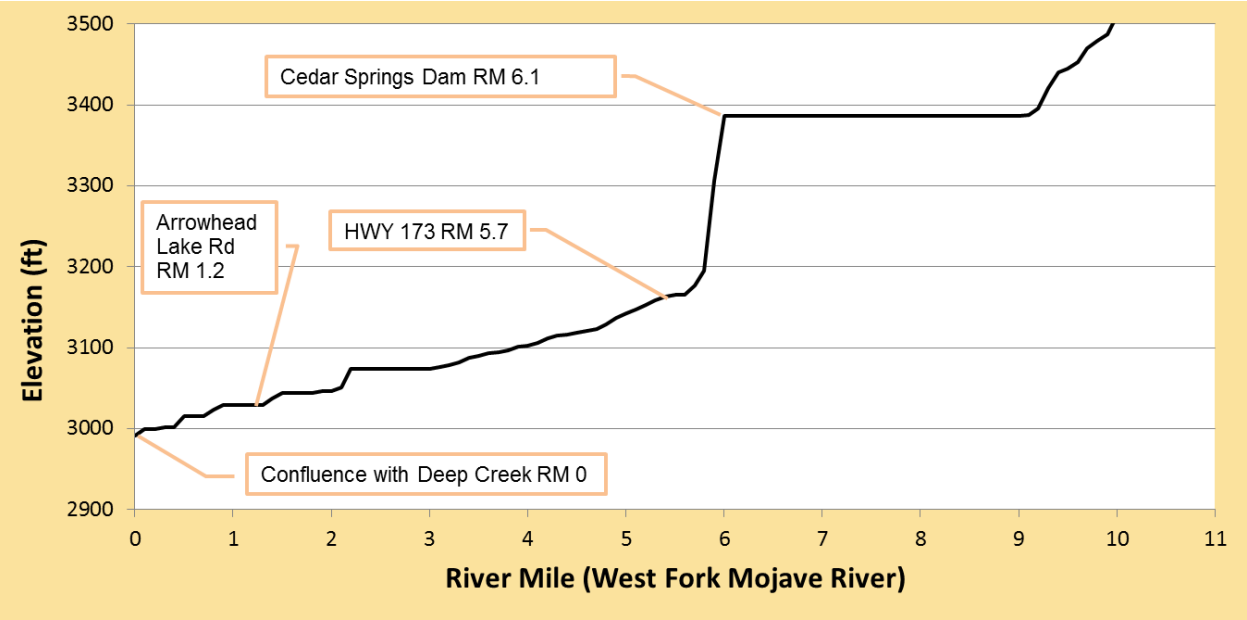


Figure 3.1-2. Drainage Basins Above the Confluence of the West Fork Mojave River and Deep Creek

Figure 3.1-3, below, shows the gradient in the West Fork Mojave River, with notable features identified by river mile.



Key:
ft = feet
HWY = Highway
Rd = Road
RM = river mile, with mile 0 as the confluence of the West Fork Mojave River and Deep Creek, and moving upstream in tenths of a river mile

Figure 3.1-3. West Fork Mojave River Profile

3.2 CLIMATE

The climate in the Project region is classified as arid or Cold Desert Climate. The area loses more water via evapotranspiration than falls as precipitation. Average annual precipitation is approximately 6 inches, with rare snowfalls, and the average annual evapotranspiration rate is 57 inches. Air temperatures range from approximately 100 degrees Fahrenheit (°F) in July to about 30°F in January.

3.3 TOPOGRAPHY

The topography around the Project consists of steep mountainous terrain surrounded by arid chaparral scrub vegetation dominated by junipers (*Juniperus* spp.), Joshua tree (*Yucca brevifolia*), and sagebrush (*Artemisia* spp.), with elevations from approximately 2,000 to 3,500 feet. Slopes range from 2 to 100 percent, and rock outcrops are common.

3.4 MAJOR LAND USES AND ECONOMIC ACTIVITIES

3.4.1 Land Uses in the Project Area

The area immediately adjacent to Silverwood Lake is owned by the State of California and managed by DPR for public recreational uses. Silverwood Lake is located within the boundary of the SBNF, but is not on NFS lands. The San Bernardino Tunnel and Devil Canyon Penstock Traverse State, NFS, and private lands, and terminate at the Devil Canyon Powerplant and Afterbays, which are primarily located on State lands, with a small portion located on municipal lands.

Silverwood Lake is wholly within San Bernardino County. Land use policies for private land in the Project area are provided by San Bernardino County's General Plan. The General Plan was adopted in March 2007 and has undergone several revisions through April 2014. NFS lands in the vicinity of the Project are managed under policies outlined in the SBNF Land and Resource Management Plan, which was adopted in 2006 and is meant to provide strategic guidance for management of the SBNF for a period of 10 to 15 years.

For a more detailed description of land uses relative to the Project, refer to, Section 5.6, Land Use and Management.

3.4.2 Economic Activities in the Project Area

San Bernardino County includes goods-producing, service-providing, and government industry sectors. Service-providing industries support the majority of the labor force within San Bernardino County (70.6 percent), while government and goods-producing industries comprise 16.9 and 12.5 percent of the labor force, respectively.

For a more detailed description of economic activities and the labor force relative to the Project area, refer to Section 5.9.

4.0 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

According to the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) (40 CFR 1508.7), a cumulative effect is the effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time, including hydropower and other land and water development activities. Note that cumulative effects under ESA are defined differently.

4.1 RESOURCES THAT COULD BE CUMULATIVELY AFFECTED

Based on information in this Application for New License, DWR concludes that the following resources have the potential to be cumulatively affected by the continued O&M of the Project as proposed in this Application for New License:

- Water resources
- Aquatic resources
- Arroyo toad, a species listed as threatened under ESA, and its designated critical habitat
- Recreation resources

Provided below are the geographic and temporal scopes of the cumulative effects analysis for these resources, and the past, present, and reasonably foreseeable future actions considered in the analysis.

4.2 GEOGRAPHIC SCOPE FOR ANALYSIS OF CUMULATIVELY AFFECTED RESOURCES

The geographic scope of the cumulative effects analysis defines the physical limits or boundaries of the Proposed Action's effect on the resources. Because the Proposed Action would affect the resources differently, the geographic scope for each resource may vary. Based on information in this Application for New License, DWR defines the geographic scope for NEPA analysis as follows:

- For water resources, the geographic scope extends from the NMWSE of Silverwood Lake downstream in the West Fork Mojave River to the NMWSE of USACE's Mojave River Dam. The NMWSE of Silverwood Lake is the upstream terminus because there is no reasonable mechanism for the Project to affect water resources upstream of Silverwood Lake, the most upstream Project feature. The NMWSE of the Mojave River Dam is the downstream terminus because the facility is a major water project. Any Project effect below the NMWSE of the Mojave River Dam would be *de minimus*.

- For aquatic resources, the geographic scope extends from the headwaters of the West Fork Mojave River and East Fork of the West Fork Mojave River, through Silverwood Lake to the NMWSE of the Mojave River Dam. The headwaters are a reasonable upstream terminus because fish in Silverwood Lake could, under some conditions, enter the tributaries. The NMWSE of the Mojave River Dam is the downstream terminus because the facility is a major water project. Any Project effect below the NMWSE of the Mojave River Dam would be *de minimus*.

- For arroyo toad, DWR defines the geographic scope as extending from north of the Highway 173 bridge downstream to the NMWSE of the Mojave River Dam. The bridge is the upstream terminus because that coincides with the upstream extent of arroyo toad critical habitat in the West Fork Mojave River. Silverwood Lake is not suitable habitat for arroyo toad, and the West Fork Mojave River upstream of the lake lacks essential habitat elements to support an arroyo toad population. USFWS (2009) described Cedar Springs Dam and Silverwood Lake as an "insurmountable barrier to further movement upstream." As described above, the Project could affect water and aquatic resources below Cedar Springs Dam. The NMWSE of the Mojave River Dam is the downstream terminus for the reasons stated above.

- For recreation resources, the geographic scope extends from the lands of the SBNF to Hesperia Recreation and Parks District jurisdiction to the north. Recreation uses at Silverwood Lake can affect uses and conditions on the PCT leading through this area. Additionally, recreation uses at the Project can affect user patterns in the SBNF, in Hesperia regional and local parks, as well as the Mojave Forks recreation area.

4.3 TEMPORAL SCOPE FOR ANALYSIS OF CUMULATIVELY AFFECTED RESOURCES

The temporal scope of the cumulative effects analysis includes a discussion of past, present, and future actions, and their effects on each resource that could be cumulatively affected. For any resource identified as potentially having cumulative effects, the temporal scope will look 30 to 50 years into the future, based on the potential term of a new license, concentrating on the effect on the resource from reasonably foreseeable future actions. The historical discussion will, by necessity, be limited to the amount of available information for each resource.

4.4 PAST, PRESENT AND REASONABLY FORESEEABLE FUTURE ACTIONS CONSIDERED FOR ANALYSIS OF CUMULATIVELY AFFECTED RESOURCES

According to FERC Guidelines on Preparing Environmental Documents, the application should include a brief discussion of past, present, and future actions, and their effects on resources based on the new license term (30 to 50 years). Further, the guidance from FERC notes the need to highlight the effect on the cumulatively affected resources

from reasonably foreseeable future actions. The past actions' effects on a resource are normally outlined in the Affected Environment section.

Each of these actions is discussed below without consideration of the added effects, if any. Incremental effects of DWR's Proposal, when taken in combination with these actions, are discussed in the appropriate resource sections of this exhibit.

4.4.1 Past and Present Actions

Past and present actions contribute to the current condition of the resources, and are intrinsically embedded in the baseline (i.e., existing conditions), and are discussed where appropriate in the specific resource sections of this exhibit.

One of the more significant past and present actions in the Project area is the construction and operation of the SWP, which is the largest state-owned and operated water storage and delivery system of its kind in the United States. The SWP commenced operations in 1960, and today includes 21 dams and more than 700 miles of canals, pipelines, and tunnels that move water from rivers in northern California to more than 26 million people in northern California, the Bay Area, the San Joaquin Valley, the Central Coast and southern California, and irrigates about 750,000.0 acres of farmland, mainly in California's Central Valley.

Since the vast majority of water in Silverwood Lake (i.e., natural inflow is rarely noticeable compared to the volume of SWP inflow, Figure 4-23 in Exhibit B) is SWP water from the SWP's Mojave Siphon Powerplant and the Mojave Siphon bypass, the SWP affects water resources (i.e., both water quantity and water quality) in Silverwood Lake. In addition, biota in SWP water, including fish and Aquatic Invasive Species (AIS), freely enter Silverwood Lake from the SWP, and these biota could affect aquatic resources in the lake.

The Project does not have discretion over releases from Silverwood Lake into the West Fork Mojave River, which is completely controlled under implementation of DWR's water agreements with the Crestline-Lake Arrowhead Water Agency (CLAWA), Las Flores Ranch (LFR), and Mojave Water Agency (MWA). Refer to Section 4.1.5 in Exhibit B for a description of these agreements. Implementation of the actions under these agreements affects water resources, including quantity and quality, in the West Fork Mojave River. The releases from Cedar Springs Dam can be in excess of 1,000 cfs, with no releases for prolonged periods of up to 9 to 10 months. Appendix H summarizes conditions in West Fork Mojave River between Cedar Springs Dam and the USACE's Saddle Dike Diversion Dam, and provides the results of DWR's December 2018 reconnaissance survey in the reach. During the survey, the upstream half of the reach had very slow flowing water (i.e., less that 1 cfs) and included moderately deep pool habitat resulting from beaver dam complexes. The downstream half of the reach was dry. No ESA-listed species or special status species were observed. Evidence of four aquatic invasive species – American bullfrog (*Lithobates catesbeianus*), red swamp crayfish (*Procambarus clarkii*), Asian clam (*Corbicula fluminea*), and Eurasian

watermilfoil (*Myriophyllum spicatum*) – were observed. The only fish species observed in the upper half of the reach were unidentified minnows and western mosquitofish (*Gambusia affinis*). Riparian habitat varied from nearly void to moderately dense in the upper portion of the reach. Riparian composition for the upper portion of the reach included common reed, shrubs including mule fat and willows, as well as intermittent sycamore, cottonwood and ash trees. In-channel disturbances observed included off-highway vehicle usage, cattle-grazing, and other human activities. Refer to Appendix H for a more detailed description of the reach, including representative photographs.

The Crest Forest County Water District's Lake Gregory and associated regional park on Houston Creek, which is upstream of Silverwood Lake, has the potential to affect water resources in Silverwood Lake and, thereby, aquatic resources in the lake and aquatic resources and arroyo toad in the West Fork Mojave River downstream of Cedar Springs Dam.

Other past and present activities in the area that could interact with the Project to affect resources cumulatively include activities, such as recreation, including off-highway vehicle (OHV) use, and road use and maintenance on the SBNF and on the non-Project portions of the Silverwood Lake SRA. These activities can affect water quality.

4.4.2 Reasonably Foreseeable Future Actions

The past and present actions described above are likely to continue in the future, though the magnitudes of particular actions may change. The SWP today includes only a fraction of the facilities originally proposed, and has only delivered an average of 2.4 million AF annually as compared to total entitlements of 4.23 million AF. DWR continues to seek out ways to expand the SWP's water delivery capacity while finding solutions for the environmental effects of water diversion. DWR anticipates that few changes will occur in the future under the CLAWA, LFR, and MWA agreements, and with Crest Forest County Water District's Lake Gregory. DWR anticipates that recreation on the SBNF and on non-Project portions of the Silverwood Lake SRA will continue to increase.

Just north of the Project in Hesperia, the proposed Tapestry development is a phased project that has construction planned for the next 30 years. There are currently 15,663 dwelling units, or homes, proposed in the Tapestry Specific Plan, and over 350.0 acres in parks and recreation development. Not all the development is necessarily foreseeable, but some level of development under the Tapestry plan is reasonably foreseeable.

DWR is unaware of any other reasonably foreseeable future actions for consideration in this cumulative effects analysis.