DEVIL CANYON PROJECT RELICENSING
FERC PROJECT NUMBER 14797

Draft License Application
Exhibit D – Statement of Costs and Financing

April 2019

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

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COMMONLY USED TERMS, ACRONYMS & ABBREVIATIONS

§	Section
AF	acre-feet
CAISO	California Independent System Operator
CFR	Code of Federal Regulations
DPR	California Department of Parks and Recreation
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
FERC	Federal Energy Regulatory Commission
kW	kilowatt
MWh	megawatt hour
O&M	operation and maintenance
PM&E measures	Protection, Mitigation, and Enhancement measures, which are operation and management activities to: (1) protect resources against impacts from continued operation and maintenance of the Project; (2) mitigate any impacts from continued operation and maintenance of the Project (if the resource cannot be fully protected); and (3) enhance resources affected by continued Project operation and maintenance
Project	Devil Canyon Project
SRA	State Recreation Area
SWP	State Water Project
U.S.	United States
U.S.C.	United States Code

1.0 INTRODUCTION

The California Department of Water Resources (DWR) has prepared this Exhibit D, Statement of Costs and Financing, 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 (Project), FERC Project No. 14797. This exhibit has been prepared in conformance with Title 18 of the Code of Federal Regulations (CFR), Subchapter B (Regulations Under the Federal Power Act), Section (§) 16.8 (Traditional Licensing Process). In particular, § 5.18(5)(iii) requires that Exhibit D meet the requirements of 18 CFR § 4.51(e). As a reference, this section states:

> The [Exhibit D] statement must contain:
>
> (1) If the application is for an initial license, a tabulated statement providing the actual or approximate original cost (approximate costs must be identified as such) of:
>
> (i) Any land or water right necessary to the existing project; and
>
> (ii) Each existing structure and facility described under paragraph (b) of this section (Exhibit A).
>
> (2) If the applicant is a licensee applying for a new license, and is not a municipality or a state, an estimate of the amount which would be payable if the project were to be taken over pursuant to section 14 of the Federal Power Act upon expiration of the license in effect [see 16 U.S.C. 807], including:
>
> (i) Fair value;
>
> (ii) Net investment; and
>
> (iii) Severance damages.
>
> (3) If the application includes proposals for any new development, a statement of estimated costs, including:
>
> (i) The cost of any land or water rights necessary to the new development; and
>
> (ii) The cost of the new development work with a specification of:
>
> (A) Total cost of each major item;

(B) Indirect construction costs such as costs of construction equipment, camps, and commissaries;

(C) Interest during construction; and

(D) Overhead, construction, legal expenses, taxes, administrative and general expenses, and contingencies.

(4) A statement of the estimated average annual cost of the total project as proposed, specifying any projected changes in the costs (life-cycle costs) over the estimated financing or licensing period if the applicant takes such changes into account, including:

(i) Cost of capital (equity and debt);

(ii) Local, state, and Federal taxes;

(iii) Depreciation or amortization;

(iv) Operation and maintenance expenses, including interim replacements, insurance, administrative and general expenses, and contingencies; and

(v) The estimated capital cost and estimated annual operation and maintenance expense of each proposed environmental measure.

(5) A statement of the estimated annual value of project power, based on a showing of the contract price for sale of power or the estimated average annual cost of obtaining an equivalent amount of power (capacity and energy) from the lowest cost alternative source, specifying any projected changes in the cost of power from that source over the estimated financing or licensing period if the applicant takes such changes into account.

(6) A statement specifying the source and extent of financing and annual revenues available to the applicant to meet the costs identified in paragraphs (e)(3) and (4) of this section.

(7) An estimate of the cost to develop the license application.

(8) The on-peak and off-peak values of project power, and the basis for estimating the values, for projects which are proposed to operate in a mode other than run-of-river.

(9) The estimated average annual increase or decrease in project generation, and the estimated average annual increase or decrease of the value of project power due to a change in project operations (i.e., minimum bypass flows, limits on reservoir fluctuations).

Excluding this introductory material, Exhibit D includes 12 sections. Section 2.0 illustrates the approach to estimating Project economics. Sections 3.0 and 4.0 address the cost of the original Project and cost related to takeover of the Project by another party, respectively. Section 5.0 describes the cost of new development associated with the Project. Section 6.0 describes existing annual Project cost of operations and gross power benefits for the No Action Alternative and DWR's Proposal. This section also provides an estimate of DWR's cost to relicense the Project. Section 7.0 compares the amount of power and value of power under the No Action Alternative and DWR's Proposal. Section 8.0 describes the cost of replacing the Project's generation with another source of power. Section 9.0 discusses the sources of financing and annual revenues to meet Project costs. Section 10.0 describes the need in the region for the Project's power. Section 11.0 describes other benefits of the Project, namely those related to recreational and water diversion. Section 12.0 describes the consequences should FERC not issue a new license to DWR. Section 13.0 provides a list of references cited in this exhibit.

See Exhibit A for a description of Project facilities and features, Exhibit B for a description of Project operations, Exhibit C for a construction history and a construction schedule, and Exhibit E for a discussion of potential environmental effects and DWR's proposed resource management measures. Project design drawings are included in Exhibit F, and Project maps are included in Exhibit G. Exhibit H contains a detailed description of the need for the electricity provided by the Project, the availability of electrical energy alternatives, and other miscellaneous information.

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2.0 PROJECT ECONOMICS APPROACH

Under FERC's approach to evaluating the economics of hydropower projects as articulated in FERC's Order Issuing a New License to the Mead Corporation (FERC 1995), the methodology is a "current cost approach" in that all costs are presented in current dollars (e.g. no consideration for potential future power costs, inflation, escalation, or deflation beyond the license issuance date; and costs to be expended over the license term are summed and normalized as current dollars). FERC's current cost economic analysis provides a general estimate of the potential developmental benefits and costs and non-developmental benefits and costs of a project. DWR has prepared this Exhibit D using FERC's current cost methodology.

This Exhibit D provides economic information regarding two alternatives:

- No Action Alternative. This is the current operation of the Project under its existing license conditions and operations. Under the No Action Alternative, the inflow to the Project and downstream water demands are the same as they have been historically. Under the No Action Alternative, there are no changes to existing Project facilities or operations. Costs under the No Action Alternative are DWR's best estimate of the average annual costs to operate the Project in the future.

- DWR's Proposal. This is DWR's proposed Project, including DWR's proposed mitigation and enhancement (PM&E) measures, which is described in DWR's license application. Costs under DWR's Proposal are similar to the costs under the No Action Alternative, with the exception of DWR's proposed changes to the PM&E measures.

Basic economic assumptions used by DWR in developing costs and benefits under both the No Action Alternative and DWR's Proposal are summarized in Table 2.1-1.

Table 2.1-1. Economic Assumptions DWR Used in Developing Costs and Power Benefits under the No Action Alternative and DWR's Proposal

Assumption	Value
Dollars	United States (U.S.) dollars to the nearest $1,000
Period of Analysis	30 Years
Term of Financing	30 Years
Insurance Rate	0%
Base Year for Costs and Benefits	Calendar Year 2018
Interest Rate	2.0%
Discount Rate	5.0%

While FERC's current cost approach requires an applicant to base costs in Exhibit D on a 30-year license term, DWR requests from FERC a new license with a term of 50 years.

3.0 ORIGINAL COSTS

This application is for a new license, not an initial license. The expiration date of the existing license covering the Project is January 31, 2022. Since this is not an application for an initial license, a tabulated statement of the actual original cost of Project land, water rights, structures, and facilities is not required to be included in DWR's Application for New License.

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4.0 COST OF PROJECT TAKEOVER

DWR is a municipality, established under the laws of the State of California, within the meaning of Section 3(7) of the Federal Power Act. Since DWR is a State of California agency, the Project is not subject to the takeover provisions of Section 14 of the Federal Power Act (16 United States Code [U.S.C.] § 807). Accordingly, an estimate of the amount that would be payable if the Project were taken over pursuant to Section 14 is not required to be included in DWR's Application for New License.

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5.0 COST OF NEW DEVELOPMENT

At this time, DWR is not proposing to add any additional power generation facilities to the existing Project.

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6.0 ANNUAL COST OF OPERATIONS AND GROSS POWER BENEFITS

Section 6 is divided into two major sections, each of which addresses the No Action Alternative and DWR's Proposal. Section 6.1 discusses Project costs, and Section 6.2 presents Project power benefits.

6.1 COST OF OPERATIONS

6.1.1 No Action Alternative

DWR estimates that, based on historical expenditures, the average annual operating and maintenance (O&M) cost under the No Action Alternative is approximately $27,015,000. The estimated average annual cost includes four components: (1) $20,754,000 incurred by DWR for O&M, station power, annual renewals and replacements, major infrastructure repairs/improvements and capital components; (2) $4,949,000 incurred by the California Department of Parks and Recreation (DPR) for O&M of Project recreation facilities within the Silverwood Lake State Recreation Area (SRA); (3) $372,000 by DWR in miscellaneous recreation costs; and (4) $500,000 by DWR for implementation of environmental measures. In addition, under the No Action Alternative, DWR intends to recover its cost to obtain a new license for the Project. DWR estimates this cost is $13,200,000 (i.e., $440,000 annually over 30 years), which includes all study costs, Traditional Licensing Process costs, cost related to obtaining Clean Water Act Section 401 Water Quality Certification, and personnel and administrative costs associated with processing. As a State of California agency, DWR is not subject to payment of any State, local, or federal taxes associated with the Project.

DWR does not have shareholders and, therefore, does not finance projects, including the relicensing, with equity capital. Any new construction, as well as the relicensing, is financed through various financial instruments, mainly the issuance of Revenue Bonds. DWR has maintained an exceptional bond rating throughout the years, including maintaining a AAA Standard and Poor's rating since 2001.

Costs of borrowings for new construction that has taken place since the original Project facilities were completed are reported in Bulletin 132, an annual publication produced by DWR and available on the following web site: http://www.water.ca.gov/.

6.1.2 DWR's Proposal

DWR estimates that the average annual O&M cost under DWR's Proposal is approximately $27,136,000. Under DWR's Proposal, the non-environmental and non-recreational average annual cost of $20,754,000, the average annual cost of $4,949,000 incurred by DPR, and the average annual cost of $440,000 for recovery of relicensing costs under the No Action Alternative would not change because DWR' Proposal includes no significant changes to non-environmental and non-recreational O&M, DPR would continue to O&M the Project recreation facilities that are part of the

Silverwood Lake SRA, and DWR would recover its relicensing costs. In contrast, under DWR's Proposal, the $500,000 DWR expends annually under existing conditions for environmental measures would increase by $493,000 for implementation of the 11 DWR proposed measures for a total of $993,000. Table 6.1-1 shows DWR's estimated costs for implementation of its proposed measures under DWR's proposal.

Table 6.1-1. DWR's Estimated Costs Related to Implementation of DWR's Proposed Measures[1]

DWR's Proposed Measure		Total Capital Cost Over 30 Years (2018 U.S. Dollars)	Total O&M Cost Over 30 Years (2018 U.S. Dollars)	Annualized Cost Over 30 Years[2] (2018 U.S. Dollars)
Designation	**Description**			
Environment Related Measures				
GS1	Implement Erosion and Sediment Control Plan	$0	$0	$0[3]
WR1	Maintain Silverwood Lake Elevations	$0	$0	$0
WR2	Implement Hazardous Materials Management Plan	$0	$0	$0[3]
AR1	Implement Silverwood Lake Fish Stocking Measure	$0	$0	$0[4]
AR2	Implement Aquatic Invasive Species Management Plan	$0	$7,891,000	$263,000
TR1	Implement Integrated Vegetation Management Plan	$0	$988,000	$33,000
LU1	Implement Transportation System Management Plan	$0	$3,450,000	$115,000
LU2	Implement Fire Prevention and Response Plan	$0	$60,000	$2,000
LU3	Develop and Implement Project Safety Plan	$0	$60,000	$2,000
VR1	Implement Visual Resources Management Plan	$0	$30,000	$1,000
CR1	Implement Historic Properties management Plan	$0	$2,296,000	$77,000
Total		**$0**	**$14,775,000**	**$493,000**

Notes:
[1] Refer to Appendix A for the complete text of each of DWR's proposed measures. DWR intends to include a Recreation Management Plan in its FLA.
[2]Total annualized costs are calculated by summing Capital Cost and Total O&M Cost, and dividing the sum by 30.
[3]DWR will include the cost for implementing this measure in the cost of a specific project when DWR proposes that project.
[4]This measure is substantially the same as the fish stocking and creel survey condition in the existing license. Therefore, no additional costs are estimated to implement the measure.
Key:
O&M = Operation and Management
U.S. = United States

6.2 GROSS POWER BENEFITS

6.2.1 No Action Alternative

The Project's installed and dependable capacity under the No Action Alternative are 272,796 kilowatts (kW) and 250,100 kW, respectively. DWR calculated dependable capacity by multiplying the Devil Canyon Powerplant's average monthly Resource Adequacy (RA) data for 2013 through 2017 by the yearly RA capacity. DWR used the California Public Utility Commission's (PUC) 2017RAReport.pdf report file multiplied the local Los Angeles Basin area RA price by the annual RA average capacity to estimate the yearly benefit of dependable capacity.

The Project generates on average 836,000 megawatt-hours (MWh) or energy annually. This is based on multiplying the Project's installed capacity by the reported Devil Canyon Powerplant operating availability average of 89.31 percent for the 2010 through 2017 period. DWR allocated the daily generation values among the California Independent System Operator (CAISO) definition for peak energy, partial peak energy, off-peak energy, and super off-peak energy to calculate generation in each of these periods. The value of the generation in each period was based on the monthly Locational Marginal Price (LMP) forecast.

The Project provides ancillary services to CAISO in the form of regulation-up, regulation-down and spinning reserves. The amount of these services in terms of MWh was averaged over the 2015 through 2017 period. The value of the ancillary service was based on the monthly LMP price for these services. Capacity, energy and ancillary service values under the No Action Alternative are provided in Table 7.0-1. Capacity, energy and ancillary service benefits under the No Action Alternative are provided in Table 6.2-1.

6.2.2 DWR's Proposal

DWR does not propose to add or remove generation facilities from the Project, and proposes to operate the Project as it has been operated historically. Therefore, under DWR's Proposal, the amount and value of the Project's capacity, energy and ancillary services will not change from the amounts and values under the No Action Alternative shown in Table 6.2-1.

Table 6.2-1. Average Annual Project Power Under the No Action Alternative[1]

Value	No Action Alternative
Annual Capacity	
Installed (kW)	272,796
Dependable (kW)	250,100
Total Average Annual Value of Capacity (2018 U.S. Dollars)	**$3,067,000**
Average Annual Energy	
Peak Energy (MWh)	203,500
Partial Peak Energy (MWh)	32,100
Off-Peak Energy (MWh)	526,200
Super Off-Peak (MWh)	74,200
Total Average Annual Value of Energy (2018 U.S. Dollars)	**$27,623,000**
Average Annual Ancillary Services	
Regulation-Up (MWh)	98,850
Regulation-Down (MWh)	102,447
Spinning Reserve (MWh)	194,810
Total Average Annual Value of Ancillary Services (2018 U.S. Dollars)	**$3,069,000**
Total Project Power Value (2018 U.S. Dollars)	**$33,759,000**

Note:
[1]Refer to Section 6.2.1 regarding how DWR calculated the values in this table.
Key:
DPR = California Department of Parks and Recreation
kW = kilowatt
MWh = megawatt hours

7.0 CHANGES IN PROJECT POWER AND VALUE

Table 7.0-2 compares the annual Project benefits and cost of the No Action Alternative and DWR's Proposal.

Table 7.0-2. Comparison of Average Annual Power Benefits[1] and Costs between the No Action Alternative and DWR's Proposal

Value	No Action Alternative	DWR's Proposal	Change[1]
Average Annual Gross Benefits (2018 U.S. Dollars)[2]			
Capacity	$3,067,000	$3,067,000	$0
Energy	$27,623,000	$27,623,000	$0
Ancillary Services	$3,069,000	$3,069,000	$0
Total Gross Benefits	**$33,759,000**	**$33,759,000**	**$0**
Average Annual Costs (2018 U.S. Dollars)[3]			
Non Environmental / Recreation O&M Costs	$20,754,000	$20,754,000	$0
DPR Costs for O&M of Project Recreation Facilities	$4,949,000	$4,949,000	$0
Recovery of Relicensing Costs	$440,000	$440,000	$0
Other Recreation Costs	$372,000	$0[4]	$-372,000
Environmental Costs	$500,000	$993,000	$493,000
Total Costs	**$27,015,000**	**$27,136,000**	**$121,000**
Average Annual Net Benefits (2018 U.S. Dollars)[5]			
Net Benefits	$6,744,000	$6,623,000	$121,000

Note:
[1]Calculated by subtracting the No Action Alternative from the Proposed Project value.
[2]Refer to Section 6.2 for source of Average Annual Benefits.
[3]Refer to Section 6.1 for Average Annual Costs.
[4]Stakeholder discussions are still ongoing with a goal of finalizing a recreation plan. The plan and associated costs will be included in the FLA.
[5]Calcualted by subtracting Average Annual Cost from the Average Annual Gross Benefits.
Key:
DPR = California Department of Parks and Recreation
kW = kilowatt
MWh = megawatt hours
PM&E = Protection Mitigation and Enhancement

In summary, DWR's Proposal would not affect Project power, but would increase Project costs by $121,000, thereby reducing the net Project benefit from $6,744,000 to $6,623,000, or by 1.8 percent.

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8.0 COST TO REPLACE PROJECT GENERATION

From DWR's perspective, to truly be considered an alternative to the Project's energy supply, any alternative must be able to be developed by DWR such that revenues offset DWR's SWP energy costs for delivery of SWP water to the same extent as the current Project.

Any decrease in power generation at the Project would need to be offset by increased purchases of zero emissions energy or by construction of new zero emission power generating facilities. 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 maintains a source of zero emission generation to adhere to DWR's Climate Action Plan and to comply with California's Clean Energy and Pollution Reduction Act (Senate Bill 350), which establishes California's greenhouse gas reduction target of 40 percent below 1990 levels by 2030 and 80 percent by 2050; and to California's Renewables Portfolio Standard Program (Senate Bill 100), which mandates that all retail sellers, such as DWR, procure electricity products from eligible renewable energy resources and zero-carbon resources so that the kWh of those products sold to their retail end-use customers achieve 60 percent by December 31, 2030 and 100 percent by December 31, 2045 of any given agency's total energy portfolio.

Alternative sources to Project power might include importing zero emission power from sources outside the region and/or siting a new zero emission generation facility or facilities in California. While importing power into the region to offset Project generation will be possible during some seasons, imports will be impossible during some seasons and hydrologic year types given the physical limits of the current transmission grid.

With regard to new generation sources, Table 8.0-1 shows a range of annual levelized cost of alternative energy as published by the California Energy Commission (CEC) in its 2015 report, Estimated Cost of New Renewable and Fossil Generation in California.

Table 8.0-1. Summary of 2013 Mid Case Levelized Costs

Start-Year = 2013 (Nominal $)	Size	Merchant		IOU		POU	
	MW	$/kW/ year	$/MWh	$/kW/ year	$/MWh	$/kW/ year	$/MWh
Generation Turbine 49.9 MW	49.9	275.66	662.81	185.13	2215.54	193.34	311.60
Generation Turbine 100 MW	100	273.83	660.52	183.47	2202.75	191.81	310.11
Generation Turbine - Advanced 200 MW	200	252.33	403.83	159.41	1266.91	200.67	215.62
Combined Cycle - 2 CTs No Duct Firing 500 MW	500	551.42	116.51	495.20	104.54	482.63	102.35
Combined Cycle - 2 CTs With Duct Firing 550 MW	550	548.14	115.81	492.86	104.05	481.32	102.08
Biomass Fluidized Bed Boiler 50 MW	50	812.34	122.04	941.97	141.53	820.03	123.54
Geothermal Binary 30 MW	30	561.31	90.63	743.97	120.21	519.74	84.98
Geothermal Flash 30 MW	30	653.36	112.48	851.61	146.72	627.91	109.50
Solar Parabolic Trough W/O Storage 250 MW	250	329.92	168.18	448.52	228.73	325.42	167.93
Solar Parabolic Trough With Storage 250 MW	250	405.52	127.40	601.76	189.12	423.90	134.81
Solar Power Tower W/O Storage 100 MW	100	342.48	152.58	471.26	210.04	336.00	151.53
Solar Power Tower With Storage 100 MW 6 hours	100	421.46	145.52	630.53	217.79	440.07	153.81
Solar Power Tower With Storage 100 MW 11 hours	100	459.85	114.06	692.04	171.72	479.73	120.45
Solar Photovoltaic (Thin-Film) 100 MW	100	206.11	111.07	315.22	170.00	219.97	121.30
Solar Photovoltaic (Single Axis) 100 MW	100	241.22	109.00	365.48	165.22	254.52	116.57
Solar Photovoltaic (Thin-Film) 20 MW	20	224.21	121.31	344.46	186.51	239.16	132.42
Solar Photovoltaic (Single Axis) 20 MW	20	259.52	117.74	394.71	179.16	273.72	125.86
Wind - Class 3 100 MW	100	181.75	85.12	223.75	104.74	160.77	75.80
Wind - Class 4 100 MW	100	173.08	84.31	213.61	103.99	153.55	75.29

Source: CEC 2015 (Table 4)
Notes:
[1]In its 2015 report, the CEC report considered three financing options for the cost of constructing and owning a power plant: merchant, investor-owned utility, and publicly owned utility. The financing of each project is highly variable depending on the project sponsor, the markets, the terms and conditions of power sales agreements, and the technology type. Merchant and IOUs finance projects based on debt and equity. POU plants do not rely on equity financing as they rely solely on debt (issue bonds). The cost of money for merchant and investor-owned utility plants is melding of two sources: equity (such as ownership shares) and debt (such as corporate bonds or loans from large banks). The publicly owned utility cost is therefore much lower as these utilities are allowed to raise money solely through debt. (CEC 2015.)
[2]Levelized cost reflects the lifetime cost of operations and maintenance combined with the installed cost expressed as a constant stream of costs per unit of value over the lifetime of the plant. It is most commonly measured in dollars per megawatt-hour, but is sometimes reported at dollars per kilowatt-year. (CEC 2015)
[3]Traditionally, levelized costs are presented using deterministic single-value estimates. In the 2009 Cost of Generation Report, the Energy Commission presented levelized costs in three deterministic values: mid, high, and low. The high and low values presented too wide of variation to be useful. In this version, high and low levelized cost values are estimated using probabilistic analysis, while the mid case continues to be estimated in the traditional deterministic fashion. These high and low probabilistic estimates are developed using 8 Lumina's Analytica Model in conjunction with the Energy Commission's COG Model, designated as Analytica Cost of Generation Analysis Tool. (CEC 2015, pp. 7-8)
Key:
CT = combustion turbine
IOU = investor-owned utility
kW/year= kilowatt per year
MW = megawatt
MWh = megawatt hour
POU = publicly owned utility

It is unlikely that the Project's generation power could be replaced in the short-term due to planning and permitting timeframes for a new source. In the long-term and to meet California's zero emission and renewable energy resources goals, the only available alternatives to the Project's generation are geothermal, biomass, solar, or wind alternatives. Using the costs in Table 8.0-1 for a single Solar Parabolic Trough With Storage 250 MW facility, the least expensive of the zero emission sources in Table 8.0-1 that can replace the Project's generation with about a single facility and assuming that a public-owned utility such as DWR develops the resource, the levelized cost would be $134.81 in 2013 dollars, or $144.02/MWh in 2018 dollars using the U.S. Bureau of Labor Statistics CPI Inflation Calculator to escalate the costs from 2013 to 2018. Therefore, the cost to replace existing Project's average annual generation using the single least expensive zero emissions source would be approximately $120,396,000 (i.e., $144.02 times 836,000 MWh, the average annual generation of the Project). Of note, this facility would not replace the Project's ancillary benefits, and the estimated cost does not include capital and O&M costs for a new electric transmission line to connect the new facility to the grid. Of course, the Project's power could be replaced by a combination of geothermal, biomass, solar, or wind sources, but the costs for this alternative cannot be estimated at this time due to the complexity of obtaining these sources.

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9.0 SOURCES OF FINANCING AND ANNUAL REVENUES TO MEET PROJECT COSTS

DWR's sources of financing and revenue are sufficient to meet the continuing O&M needs of the Project, as evidenced by DWR's 45 year-long history of operating and maintaining the existing Project in a safe and efficient manner. Historically, DWR has funded Project O&M by issuance of short term Commercial Paper, Long-Term Revenue Bonds, and power sales with ultimate repayment of all expenditures by the 29 State Water Project Contractors.

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10.0 NEED FOR POWER

The power generated at the Project is critical for the continued operation of DWR's SWP. The energy required to transport SWP water to southern California makes up one of the largest cost components annually of the SWP. While the Devil Canyon Powerplant output is delivered to the California Power Grid, its output effectively helps DWR partially offset the costs for energy needed for operating the SWP. More specifically, the revenue from power generation offsets the cost of delivering water to southern California, keeping water costs more affordable in the region and preserving economic vitality and quality of life for residents. Additionally, the Project is necessary in both the short and long term to maintain system reliability, operational flexibility, and low-cost electricity.

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11.0 OTHER PROJECT BENEFITS

11.1 RECREATION

Recreational amenities, such as shoreline access, parking, restrooms, camping, picnicking, and fishing are available at Silverwood Lake, which is included in the Devil Canyon Project facilities. (On May 20, 2016, DWR submitted to FERC an update to its Recreation Plan, including facility and amenity tables and updated recreation maps.)

At the Normal Maximum Water Surface Elevation of 3,353 feet, Silverwood Lake has a storage capacity of 73,032 acre-feet (AF), a usable storage capacity of 33,820 AF, a surface area of 962.0 acres, and a shoreline length of approximately 13 miles. Article 58 of the existing FERC license requires DWR to maintain Silverwood Lake surface elevations at the highest, most practicable level commensurate with other Project purposes during the summer recreation season.

Silverwood Lake is primarily a warm-water fishery, consisting of largemouth bass, bluegill, black crappie, striped bass, channel catfish, and white catfish. A cold-water fishery is maintained by stocking hatchery-raised rainbow trout.

In addition to being popular with boaters and anglers, Silverwood Lake and its surrounding shoreline, which make up the Silverwood Lake State Recreation Area (SRA), are popular with swimmers, campers, hikers, bikers, and picnickers, particularly during the summer months. Silverwood Lake SRA recreation facilities include: campgrounds, a nature center, picnic areas, boat launches, a marina, and swim beaches.

11.2 WATER DIVERSIONS

As stated above, the revenue from the Project’s power generation offsets the cost of delivering water to southern California, keeping water costs more affordable in the region and preserving economic vitality and quality of life for residents.

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12.0 CONSEQUENCE OF LICENSE APPLICATION DENIAL

If DWR were to not receive a new license for the Project, DWR would retain its non-power generating facilities because they are used to provide consumptive water to DWR's service territory and because DWR currently holds the consumptive water rights for use of the existing Project facilities. However, DWR would not receive the energy revenue from the existing Project, which would result in higher costs to its customers for consumptive water. In addition, the many environmental and recreation benefits of the Project that are realized through the FERC license, would be lost.

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13.0 REFERENCES CITED

California Energy Commission (CEC). 2015. Estimated Cost of New Renewable and Fossil Generation in California (Final Staff Report). March. Accessed June 19, 2018. http://www.energy.ca.gov/2014publications/CEC-200-2014-003/CEC-200-2014-003-SF.pdf

Federal Energy Regulatory Commission (FERC), Office of Hydropower Relicensing. 1995. Order Issuing New License, Mead Corporation. Project No. 2506. Washington, DC.

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