Boundary Hydroelectric Project (FERC No. 2144)

Addendum to Exhibit D of the License Application

Seattle City Light

March 2010

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1 INTRODUCTION TO EXHIBIT D ADDENDUM

This document is an addendum to Exhibit D of Seattle City Light's (SCL) License Application for the Boundary Hydroelectric Project (FERC No. 2144) that was filed with FERC on September 29, 2009. The inserts on the following pages represent complete replacements of the corresponding sections in Exhibit D, allowing the reviewer to refer to only one document, i.e., either the Exhibit D filed with the License Application or this addendum, for a given section or subsection. Each replacement section below is thoroughly documented so that there is no ambiguity as to what portions of Exhibit D have been replaced.

The organization of the following document parallels that of Exhibit D, i.e., sections are presented in the same order and all revised sections, tables, or figures are numbered or referred top according to the same scheme used in Exhibit D.

2 REVISED SECTIONS OF EXHIBIT D

2.1. New Development Costs (Section 4 of Exhibit D)

The following section replaces Section 4, New Development Costs.

As used here, "new development work" includes (a) any capital expended to carry out improvements or betterments to the Project consistent with existing long-term plans that will continue during the term of a new license, or with the proposals contained in Exhibits A, B, C, E, and H (as revised March 2010) as well as (b) any capital required to provide environmental mitigation or enhancement during the term of a new license.

Costs for new development work for capital projects, for hydroelectric infrastructure as well as PM&E measures, are summarized in Table D.4-1. Total estimated costs include interest during construction (IDC) and overhead. It is expected that land rights will need to be acquired for the implementation of several of the new developments related to fish and aquatics PM&E measures, but the extent and cost of these land rights is unknown at this time.

The following table replaces Table D.4-1,* Summary of estimated capital costs associated with new development (All costs in 2007 dollars), *in Exhibit D of the License Application.

Table D.4-1. Summary of estimated capital costs associated with new development (All costs in 2009 dollars). [1]

Component	Estimated Cost	Interest During Construction (IDC)	Overhead	Total Capital Cost
Hydroelectric Infrastructure				
Unit 55 Generator Rebuild (including runner replacement) (Year 1)	$12,450,000 [2]	$579,286	$1,494,000	$14,523,286
Unit 56 Generator Rebuild (including runner replacement) (Year 1)	$21,650,000 [2]	$1,528,472	$2,598,000	$25,776,472
Forebay Wall Hardening (Year 1)	$8,000,000	$1,169,461	$960,000	$10,129,461
Transformer Banks 151-156 Rock Damage Mitigation (Year 1 [3])	$10,500,000	$1,264,337	$1,260,000	$13,024,337
Replace Step-up Transformer, Bk 240-153/4/1/2 (Year 1)	$12,000,000	$1,142,675	$1,440,000	$14,582,675
Unit 54 Generator Rebuild (Year 4)	$7,200,000	$335,009	$864,000	$8,399,009
Unit 53 Generator Rebuild (Year 5)	$7,400,000	$344,315	$888,000	$8,632,315
Unit 51 Generator Rebuild (Year 6)	$7,700,000	$358,273	$924,000	$8,982,273
Unit 52 Generator Rebuild (Year 7)	$8,000,000	$372,232	$960,000	$9,332,232
Replace Isophase Bus (Year 7)	$12,000,000	$1,142,675	$1,440,000	$14,582,675
Ozone Abatement (Year 10)	$4,500,000	$103,500	$540,000	$5,143,500
Unit 54 Runner Replacement (Year 17)	$12,000,000	$558,348	$1,440,000	$13,998,348
Unit 52 Runner Replacement (Year 18)	$12,000,000	$558,348	$1,440,000	$13,998,348
Unit 53 Runner Replacement (Year 19)	$12,000,000	$558,348	$1,440,000	$13,998,348
Unit 51 Runner Replacement (Year 20)	$12,000,000	$558,348	$1,440,000	$13,998,348
Transformer Banks 151-156 Rock Damage Mitigation (Year 23)	$6,000,000	$138,000	$720,000	$6,858,000
Unit 55 Generator Rebuild (including runner replacement) (Year 28)	$23,000,000	$579,286	$1,494,000	$14,523,286
Unit 56 Generator Rebuild (including runner replacement) (Year 29)	$23,000,000	$1,528,472	$2,598,000	$25,776,472
Unit 54 Generator Rebuild (Year 34)	$7,200,000	$335,009	$864,000	$8,399,009
Unit 53 Generator Rebuild (Year 35)	$7,400,000	$344,315	$888,000	$8,632,315
Unit 51 Generator Rebuild (Year 36)	$7,700,000	$358,273	$924,000	$8,982,273
Unit 52 Generator Rebuild (Year 37)	$8,000,000	$372,232	$960,000	$9,332,232
Replace Step-up Transformer, Bk 240-153/4/1/2 (Year 41)	$12,000,000	$1,142,675	$1,440,000	$14,582,675
Transformer Banks 151-156 Rock Damage Mitigation (Year 48)	$6,000,000	$138,000	$720,000	$6,858,000

Component	Estimated Cost	Interest During Construction (IDC)	Overhead	Total Capital Cost
Unit 54 Runner Replacement (Year 47)	$12,000,000	$558,348	$1,440,000	$13,998,348
Unit 52 Runner Replacement (Year 48)	$12,000,000	$558,348	$1,440,000	$13,998,348
Unit 53 Runner Replacement (Year 49)	$12,000,000	$558,348	$1,440,000	$13,998,348
Unit 51 Runner Replacement (Year 50)	$12,000,000	$558,348	$1,440,000	$13,998,348
Minor Improvement Projects (Annual) [4]	$500,000,000	$11,500,000	$60,000,000	$571,500,000
Hydroelectric Infrastructure Subtotal:	**$807,700,000**	**$31,515,779**	**$96,924,000**	**$936,139,779**
Environmental Measures				
Geology and Soils				
Erosion Control Measures at Three (3) Designated Sites (the Forebay Recreation Area, Bureau of Land Management (BLM) Boundary Recreation Area, and the Dispersed Recreation Day Use/Overnight Campsite on BLM-Managed Land) (as part of the Erosion Program, a component of the Terrestrial Resources Management Plan [TRMP])	$397,000	$9,131	$47,640	$453,771
Geology and Soils Total:	**$397,000**	**$9,131**	**$47,640**	**$453,771**
Water Resources				
Acquisition of Flood Easements	$720,000	$16,560	$86,400	$822,960
Design, Testing and Evaluation of Structural Total Dissolved Gas (TDG) Abatement Measures	$15,204,471	$1,073,423	$1,824,537	$18,102,431
Water Resources Total:	**$15,924,471**	**$1,089,983**	**$1,910,937**	**$18,925,391**
Fish and Aquatics Resources				
Upstream Fish Passage Trap-and-Haul Facility	$60,620,000	$2,820,588	$7,274,400	$70,714,988
Entrainment Reduction Facility (if deemed necessary)	$53,529,000	$2,490,651	$6,423,480	$62,443,131
Mainstem Gravel Augmentation (initial implementation and replenishment)	$7,337,233	$168,756	$880,468	$8,386,457
Channel Modifications for Mainstem Trapping Pools at Project River Mile (PRM) 30.3 (initial implementation and replacement)	$691,650	$15,908	$82,998	$790,556
Placement of Mainstem Large Woody Debris (LWD) Jams at Tributary Deltas (initial implementation and replacement)	$2,170,160	$49,914	$260,419	$2,480,493
Riparian Improvement and Stream Channel Enhancements in Sullivan Creek River Mile (RM) 0.30 to RM 0.54 (initial implementation)	$1,939,970	$44,619	$232,796	$2,217,386

Component	Estimated Cost	Interest During Construction (IDC)	Overhead	Total Capital Cost
Stream, and Riparian Improvements in Sullivan Creek RM 2.30 to RM 3.00 and North Fork Sullivan Creek (initial implementation)	$1,805,350	$41,523	$216,642	$2,063,515
LWD Placement and Road Improvements in Sullivan Creek and Selected Tributaries Upstream of the Confluence with Outlet Creek (initial implementation)	$3,471,430	$79,843	$416,572	$3,967,844
Culvert Replacements and LWD Placement in Tributaries to Boundary Reservoir (initial implementation)	$8,041,765	$184,961	$965,012	$9,191,737
Riparian Planting, Culvert Replacement and Channel Reconstruction in Linton Creek RM 0.00 to RM 0.24 (initial and replacement)	$1,046,400	$24,067	$125,568	$1,196,035
Riparian and Channel Improvements in Sweet Creek RM 0.00 to RM 0.60 (initial and replacement)	$1,700,260	$39,106	$204,031	$1,943,397
Habitat Improvement in Tier-2 Tributaries to Boundary Reservoir (initial implementation)	$1,250,000	$28,750	$150,000	$1,428,750
Establish Fund for Habitat Improvements in Tributaries to Sullivan Lake	$2,500,000	$57,500	$300,000	$2,857,500
Closure and Restoration of Sullivan Creek Dispersed Recreation Sites	$4,100,000	$94,300	$492,000	$4,686,300
Native Salmonid Conservation Program	$13,346,500	$620,999	$1,601,580	$15,569,079
Fish and Aquatics Resources Total:	**$163,549,718**	**$6,761,485**	**$19,625,966**	**$189,937,169**
Botanical Resources				
No new development proposed that involves design and construction	NA	NA	NA	NA
Wildlife Resources				
Habitat Management, Enhancement and Protection Program (a component of the TRMP):				
• Motorized Vehicle Access Control	$175,000	$4,025	$21,000	$200,025
• Wetland/Riparian, Riparian and Upland Habitat Protection and Enhancement Measures; Acquisition of Additional Property for Project Habitat Lands	$1,704,000	$79,285	$204,480	$1,987,765
• Island and Shoreline Access Control	$40,000	$920	$4,800	$45,720
Wildlife Resources Total:	**$1,919,000**	**$84,230**	**$230,280**	**$2,233,510**
Threatened and Endangered Species				
Addressed by Fish and Aquatics Resources and Wildlife Resources measures	NA	NA	NA	NA
Aesthetics/Visual Resources				
Addressed by Recreation Resources measures	NA	NA	NA	NA

Component	Estimated Cost	Interest During Construction (IDC)	Overhead	Total Capital Cost
Cultural Resources				
No new development proposed that involves design and construction	NA	NA	NA	NA
Recreation Resources and Land Use				
Improvements at Boundary Forebay Recreation Area	$2,360,682	$109,840	$283,282	$2,753,804
Improvements at Boundary Vista House Recreation Area	$244,071	$5,614	$29,289	$278,973
Improvements at Boundary Tailrace Recreation Area/Machine Hall Visitors' Gallery	$324,053	$7,453	$38,886	$370,393
Improvements at Metaline Waterfront Park Boat Launch	$1,636,228	$76,132	$196,347	$1,908,707
Development of Peewee Falls Viewpoint and Trail	$202,000	$4,646	$24,240	$230,886
Development of Metaline Falls Portage Trail and Boaters Access	$274,305	$6,309	$32,917	$313,531
Development of Riverside Mine Canyon Viewpoint and Trail	$211,000	$4,853	$25,320	$241,173
Development of Eastside Trail	$581,984	$13,386	$69,838	$665,208
Enhancements to Designated Dispersed Shoreline Recreation Sites	$252,027	$5,797	$30,243	$288,067
Shoreline Management Program (a component of the Recreation Resources Management Plan [RRMP])	$141,282	$3,249	$16,954	$161,485
Travel and Public Access Program (a component of the RRMP)	$510,000	$11,730	$61,200	$582,930
Major Road Maintenance	$90,000	$2,070	$10,800	$102,870
Decommissioning of Well Heads and Associated Roads	$305,000	$7,015	$36,600	$348,615
Project Boundary Adjustments	$500,000	$11,500	$60,000	$571,500
Recreation Resources and Land Use Total:	**$7,632,632**	**$269,594**	**$915,916**	**$8,818,141**
Socioeconomics				
Addressed by measures of other resource areas	NA	NA	NA	NA
Tribal Resources				
Addressed by measures of other resource areas	NA	NA	NA	NA
Environmental Measures Subtotal:	**$189,422,821**	**$8,214,423**	**$22,730,738**	**$220,367,982**
Grand Total:	**$997,122,821**	**$39,730,202**	**$119,654,738**	**$1,156,507,762**

Notes:

1 SCL does not anticipate indirect construction costs for any of the projects.

2 The significant difference in the costs presented for Units 55 and 56 is due to the fact that a large portion of the Unit 55 cost will be spent under the current license term.

3 Effort commenced in 2009, under current license term.

4 Based on an estimated annual spending average of $11.4 million.

All costs associated with PM&E measures (capital and O&M) are summarized by resource area in Table D.4-2 and detailed by individual measure in Appendix 1.

The following table replaces Table D.4-2,* Summary of estimated costs associated with SCL's PM&E proposal (All costs in 2007 dollars), *in Exhibit D of the License Application.

Table D.4-2. Summary of estimated costs associated with SCL's PM&E proposal (All costs in 2009 dollars).

Component	Estimated Capital	Annualized O&M	Annualized Cost [1]
Project Operational Measures	NA	$0 [2]	$0
Geology and Soils	$397,000	$8,124	$24,144
Water Resources	$15,924,471	$541,301	$1,183,919
Fish and Aquatic Resources	$163,549,718	$5,836,807	$12,436,721
Botanical Resources	NA	$179,302	$179,302
Wildlife Resources	$1,919,000	$125,700	$203,139
Threatened and Endangered Resources – Addressed by Wildlife and Fish and Aquatics Resources measures	NA	NA	NA
Aesthetics/Visual Resources – Addressed by Recreation Resources measures	NA	NA	NA
Cultural Resources	NA	$10,969	$10,969
Recreation Resources and Land Use	$7,632,632	$211,096	$519,104
Socioeconomics – Addressed by measures of other resource areas	NA	NA	NA
Tribal Resources – Addressed by measures of other resource areas	NA	NA	NA
Operational PM&E Measures Subtotal:	**NA**	**$0**	**$0**
Non-operational PM&E Measures Subtotal:	**$189,422,821**	**$6,913,298**	**$14,557,298**
Total:	**$189,422,821**	**$6,913,298**	**$14,557,298**

Notes:
1 Annualized values based on a 50-year license term.
2 There is no anticipated loss of total generation for the proposed operational PM&E measures.

2.2. Value of Project Power (Section 6 of Exhibit D)

The following section replaces Section 6.3, On-peak and Off-peak Values of Project Power.

In 2009, the average on-peak energy value was $35.70/MWh, and the average off-peak hour energy value was $28.62/MWh. These values are based on SCL sales, which vary by time of year and differ from a simple average price over all hours in the periods. During the course of

the year, the on-peak/off-peak difference is usually highest in the summer and lowest in the winter. The Western Electricity Coordinating Council (WECC) defines the periods.

Over the new license term, some difference between on-peak and off-peak is likely on a monthly and annual basis. New supply resources will be renewable or gas-fired, which typically have offsetting effects on the on-peak/off-peak price differences. If gas-fired plants are run more during both periods, the price difference will be smaller. Wind is the predominant new source of renewable energy, and by its nature is most productive during early morning and evening hours, which are at the cross-over between peak and off-peak periods. This could produce more volatility in general, although this is difficult to quantify reasonably, and result in higher prices during certain peak hours, when the wind is not blowing, and lower peak prices when the wind is blowing.

3 REFERENCES

There are no new references in this addendum that were not already cited in Exhibit D of the License Application.

APPENDIX 1: SUMMARY OF ESTIMATED COSTS ASSOCIATED WITH PROPOSED PM&E MEASURES (ATTACHMENT D-1 OF EXHIBIT D)

Summary of Estimated Costs Associated with Proposed PM&E Measures [1,2]

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost [3]**	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
GENERAL						
• Convene the Boundary Resource Coordinating Committee (BRCC): o Develop and meet on an annual integrated 3-year rolling work plan	Included in costs for individual resource work groups below	See below	See below	See below	See below	See below
PROJECT OPERATIONAL MEASURES (FLOW REGIME / RESERVOIR LEVELS)						
• Modify Boundary Reservoir operations according to the following constraints: o Formalize the voluntary measure of restricting forebay water surface elevations during the summer recreation season o Formalize the voluntary measure to operate Units 55 and 56 above 125 MW and sequence their startup and shutdown so that they are the last units to be brought on line and the first units to be shut down in order to reduce total dissolved gas (TDG) under normal, non-spill operations [5]	NA	NA	$0 [4]	Annual	$0	$0
Project Operational Measures Total:	**NA**	**NA**	**$0**	**--**	**$0**	**$0**

[1] All costs in 2009 dollars.
[2] Annualized values based on a 50-year license term.
[3] Calculation of annualized values for capital costs includes the addition of interest during construction (IDC) and overhead.
[4] There is no anticipated loss of total annual generation for the proposed operational PM&E measures.
[5] When the proposed upgrades of Units 55 and 56 are completed, SCL will re-evaluate the need for the unit sequencing and adjust the approach to, or eliminate, the sequencing restrictions as appropriate.

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost** [3]	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
GEOLOGY AND SOILS						
• Implement a Terrestrial Resources Management Plan (TRMP). o Programs included under the plan include: ▪ Erosion Program ▪ Habitat Management, Enhancement, and Protection Program ▪ Integrated Weed Management Program ▪ Rare, Threatened and Endangered (RTE) Plant Species Program ▪ Wildlife Program ▪ Shoreline Management Program o Reporting and consultation with the Terrestrial Resources Work Group (TRWG)	Included in costs for individual program below	See below	See below	See below	See below	See below

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost [3]**	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Implement an Erosion Program (a component of the TRMP):						
o Implement erosion control measures at three specified sites: the Forebay Recreation Area, Bureau of Land Management (BLM) Boundary Recreation Area, and the Dispersed Recreation Day Use/Overnight Campsite on BLM-Managed Land	$397,000	$16,021	$7,166	Every 10 years	$849	$16,869
o Monitor erosion control measures at three specific sites	NA	NA	$61,427	Every 10 years	$7,275	$7,275
o Long-term erosion monitoring for lands adjacent to the Project reservoir	NA	NA	O&M included in monitoring of erosion control measures costs above	See above	See above	See above
o Track shoreline erosion at all existing and any new sites along the reservoir shoreline to determine need for additional mitigation	NA	NA	O&M included in monitoring of erosion control measures costs above	See above	See above	See above
• Provide off-site mitigation for continuing erosion effects (through incorporation of the BWP Addition [89 acres[6]], portions of three SCL-owned parcels that current reside outside the Project boundary [Tailrace East (86.9 acres), Everett Creek (82.7 acres), and Sullivan Creek (17.7 acres)], and additional property, to be acquired with a target area of approximately 158 acres and approximately 13,022 lineal feet of land immediately adjacent to water, that SCL will purchase, and management for biodiversity – also identified under Botanical Resources, Wildlife Resources, and Recreation and Land Use)	Included in Habitat Mgmt, Enhancement and Protection costs (Wildlife Resources) below	See below	NA	NA	NA	See below
Geology and Soils Total:	**$397,000**	**$16,021**	**--**	**--**	**$8,124**	**$24,144**

[6] The size of the adjoining SCL-owned parcels is 89 acres, not 88 acres as previously reported.

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost [3]**	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
WATER RESOURCES						
• Acquire flood easements from private landowners in Metaline and Metaline Falls to compensate for Project-related contributions to flooding upstream of Metaline Falls and restrict future development in easement areas[7]	$720,000	$29,055	NA	NA	NA	$29,055
• Implement a Total Dissolved Gas (TDG) Attainment Plan. Components under the plan include:						
o Study, develop engineering designs, and prototype some combination of throttling sluice gates, roughening sluice flow and installing a spillway splitter(s)/aerator(s) to develop a structural and operational modifications to improve TDG performance [8]	$15,204,471	$613,564	$379,560	Annual	$379,560	$993,124
o Conduct biological sampling using boat electrofishing in the Project tailrace area	NA	NA	Included in preceding line item cost	See above	See above	See above
o Reporting and consultation with the Washington Department of Ecology, Water Quality Work Group (WQWG), and Fish and Aquatics Work Group (FAWG)	NA	NA	$1,400	Annual	$1,400	$1,400
• Implement a Dissolved Oxygen (DO) Attainment Plan. Components under the plan include: o Develop a Quality Assurances Project Plan (QAPP) o DO and pH monitoring from June 15 through September 15, at the Box Canyon Tailrace (Project River Mile [PRM] 34.3), Metaline Old (PRM 28.1), Everett Creek Island (PRM 20.4), Boundary Forebay (PRM 17.6), and Boundary Tailrace (PRM 16.7) stations o Reporting and consultation with the Washington Department of Ecology	NA	NA	$380,000	Annual Years 1-5	$15,335	$15,335

[7] Because these easements are unnecessary for normal Project operations, SCL does not propose to include any provisions relating to these easements in the new License.

[8] Costs are associated with the combination of the following: throttling 4 sluice gates, roughening sluice flow at 3 gates, and spillway modifications that involve installation of 2 deflectors and air induction.

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost** [3]	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Implement a Temperature Attainment Plan. Components under the plan include: o Develop a QAPP o Collect continuous temperature data from June through September at the following four locations: Metaline Pool (PRM 28.4), Slate Creek Pool (PRM 22.5), Boundary Dam Forebay (PRM 17.0), and the Boundary Dam (PRM 16.1) o Implement and monitor various aquatic habitat improvement projects in the Pend Oreille River system to help meet temperature improvement goals: ▪ Tributary aquatic habitat improvements, including riparian plantings, stream channel modifications, large woody debris (LWD) supplementation, bank improvements, and culvert replacements ▪ Mainstem habitat measures, including erosion control measures/riparian plantings ▪ Temperature monitoring in the deltas of Sullivan, Sweet, and Linton creeks o Reporting and consultation with the Washington Department of Ecology	NA	NA	$950,000	Annual	$19,000	$19,000

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost** [3]	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Implement an Aquatic Invasive Species Control and Prevention Plan (AISCPP). Components under the plan include: o Develop a QAPP o Install and replace bottom barriers for macrophyte suppression at the following four locations: Everett Island side channel (PRM 19.4), Metaline Pool, across from the Town of Metaline (PRM 28.7), Fish Stranding and Trapping Region 9 (PRM 28.8), and Fish Stranding and Trapping Region 11 (PRM 30.3) o Implement appropriate suppression measures (initially bottom barriers) at up to three additional locations in the Project area o Monitor effectiveness of bottom barriers o Monitor Forebay Recreation Area and Metaline Waterfront Park boat launches for macrophyte growth o Implement appropriate suppression measures at Forebay Recreation Area and Metaline Waterfront Park boat launches, if needed o Monitor for invasive aquatic species: ▪ Substrate sampling for zebra/quagga mussels and New Zealand mudsnails ▪ Plankton tow net sampling for zebra/quagga mussel veligers o Conduct lab analysis if invasive aquatic species found o Implement an Interpretation and Education (I&E) Program (a component of the Recreation Resources Management Plan [RRMP]) o Reporting and consultation with the Washington Department of Ecology, WQWG, and FAWG	NA	NA	$3,057,500	Varies	$123,383	$123,383

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost [3]**	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Implement a Fish Tissue Sampling Plan Components under the plan include: o Develop a QAPP o Collect and analyze fish tissue samples for lead and zinc concentrations at the following four sites: Boundary Dam forebay, near Everett Island in the Canyon Reach, near Metaline Falls, and just downstream of the Box Canyon Dam tailrace o Reporting and consultation with the Washington Department of Ecology and the Washington Department of Health	NA	NA	$65,000	Varies	$2,623	$2,623
Water Resources Total:	**$15,924,471**	**$642,619**	**--**	**--**	**$541,301**	**$1,183,919**
FISH AND AQUATICS RESOURCES						
• Implement a Fish and Aquatics Management Plan that encompasses all fish and aquatics-related PM&E measures: o Reporting and consultation with the FAWG, including Passage Advisory Committee (PAC) and Technical Advisory Committee (TAC) o Develop a Tributary Management Plan and implementation schedule	NA	NA	$619,200	Annual	$619,200	$619,200
• Develop and implement an upstream fish passage program:						
o Fishway design research, design, and construction	$60,620,000	$2,446,270	NA	NA	NA	$2,446,270
o Fishway operations	NA	NA	$5,040,000	Years 15 through 50	$203,385	$203,385

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost** [3]	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Develop and implement an entrainment reduction program:						
o Research and monitoring	NA	NA	$4,576,000	Varies for Years 1 through 18	$184,661	$184,661
o Calculate dam survival	NA	NA	Included in research and monitoring cost above	See above	See above	See above
o Hydraulic evaluations and conceptual facility design and decision about entrainment reduction measures	NA	NA	Included in research and monitoring cost above	See above	See above	See above
o Implement non-operational measures OR design, build, operate, monitor and modify facilities	$53,529,000	$2,160,119	$44,610,000	Varies for Years 19 through 50	$1,800,200	$3,960,318
o Re-evaluate project entrainment	Included in preceding line item cost	See above	See above	See above	See above	See above
o Implement non-operational measures OR construct new facility, expand existing facility, or implement operational measures	Included in preceding line item cost	See above	See above	See above	See above	See above
• Implement gravel augmentation below Box Canyon Dam:	$7,337,233 (initial and replenishment)	$296,088	NA	NA	NA	$296,088
o Post-treatment physical, pre-replenishment physical, and biological monitoring	NA	NA	$360,000	Every 5 years	$14,528	$14,528
• Implement channel modifications for mainstem trapping pools at Project river mile (PRM) 30.3:	$691,650 (initial and repairs)	$27,911	NA	NA	NA	$27,911
o Compliance and physical monitoring	NA	NA	$90,000	Every 5 years	$3,632	$3,632

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost [3]**	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Implement mainstem engineering large woody debris (LWD) placement at tributary deltas:	$2,170,160 (initial and replenishment)	$87,575	NA	NA	NA	$87,575
o Compliance and effectiveness monitoring	NA	NA	$140,000	Every 5 years	$5,650	$5,650
• Boundary Reservoir fish community monitoring	NA	NA	$250,000	Every 5 years	$54,901	$54,901
• Evaluation of salmonid predation at select tributary deltas	NA	NA	$500,000	Twice (Years 4 and 15)	$20,177	$20,177
• Implement tributary non-native trout suppression and eradication measures:	NA	NA	$17,781,670	Varies	$717,565	$717,565
o Eradication effectiveness monitoring						
• Implement riparian improvement and stream channel enhancements in Sullivan Creek river mile (RM) 0.30 to RM 0.54:	$1,939,970 (initial)	$78,286	$2,198,400 (repairs)	Varies	$88,715	$167,001
o Compliance and effectiveness monitoring	NA	NA	$950,000	Varies	$38,366	$38,336
• Implement stream and riparian improvements in Sullivan Creek RM 2.30 to RM 3.00 and North Fork Sullivan Creek:	$1,805,350 (initial)	$72,853	$228,600 (repairs)	Varies	$9,225	$82,078
o Compliance and effectiveness monitoring	NA	NA	$245,000	Varies	$9,887	$9,887
• Implement LWD placement and road improvements in Sullivan Creek and selected tributaries upstream of the confluence with Outlet Creek:	$3,471,430 (initial)	$140,087	$11,084,100 (repairs)	Varies	$447,290	$587,376
o Compliance and effectiveness monitoring	NA	NA	$1,965,000	Varies	$79,296	$79,296
• Implement culvert replacements and LWD placement in tributaries to Boundary Reservoir:	$8,041,765 (initial)	$324,519	$1,084,326 (repairs)	Varies	$21,687	$346,205
o Compliance and effectiveness monitoring	NA	NA	$1,155,000	Varies	$23,100	$23,100
• Implement riparian planting, culvert replacement and channel reconstruction in Linton Creek RM 0.00 to RM 0.24:	$1,046,400 (initial and repairs)	$42,227	NA	NA	NA	$42,227
o Compliance and effectiveness monitoring	NA	NA	$45,000	Varies	$1,816	$1,816
• Implement riparian and channel improvements in Sweet Creek RM 0.00 to RM 0.60:	$1,700,260 (initial and repairs)	$68,613	NA	NA	NA	$68,613
o Compliance and effectiveness monitoring	NA	NA	$220,000	Varies	$4,400	$4,400

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost** [3]	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Implement habitat improvements in Tier-2 tributaries to Boundary Reservoir: o Compliance and effectiveness monitoring	$1,250,000 (initial)	$50,443	$130,000 (repairs and monitoring)	Varies	$5,246	$55,689
• Closure and restoration of Sullivan Creek dispersed recreation sites	$4,100,000	$165,452	$1,500,012	Annual	$30,000	$195,452
• Mill Pond Dam site monitoring and maintenance	NA	NA	$1,800	Annual	$1,800	$1,800
• Develop and implement a Native Salmonid Conservation Program	$13,346,500	$538,587	$34,200,000 (monitoring)	Annual Starting Year 6	$1,380,113	$1,918,700
• Develop and implement a Recreational Fish Stocking Program	NA	NA	$72,000	Annual	$72,000	$72,000
• Establish Sullivan Lake Upper Tributary Fund	$2,500,000	$100,885	NA	NA	NA	$100,885
Fish and Aquatic Resources Total:	**$163,549,718**	**$6,599,914**	**--**	**--**	**$5,836,807**	**$12,436,721**
BOTANICAL RESOURCES						
• Incorporate into the Project boundary the BWP Addition (89 acres), portions of three SCL-owned parcels that currently reside outside the Project boundary (Tailrace East [86.9 acres], Everett Creek [82.7 acres], and Sullivan Creek [17.7 acres]), and additional property, to be acquired with a target area of approximately 158 acres and approximately 13,022 lineal feet of land immediately adjacent to water, and manage for the benefit of botanical resources (also identified under Geology/Soils, Wildlife Resources, and Recreation and Land Use)	Included in Weeds, RTE Plant and Habitat Mgmt, Enhancement and Protection Programs costs below	See above	See above	See above	See above	See above

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost** [3]	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Implement an Integrated Weed Management Program (a component of the TRMP): o Initial inventory to document the location and extent of weed populations o Periodic inventories to identify any new infestations of noxious weeds and monitoring of new infestations, as needed o Develop and implement an integrated program to minimize the establishment of noxious weeds in the Project area and along roads and at recreation areas o Control and effectiveness monitoring of Class A and Class B-designated weed species on SCL lands within the Project boundary and along roads and recreation areas, and on federal lands within the reservoir fluctuation zone	NA	NA	$2,644,424	Per TRMP Impl. Schedule [TRMP Appendix 2]	$106,714	$106,714
• Implement RTE Plant Species Program (a component of the TRMP): o Qualitative periodic surveys to evaluate RTE species distribution and population trends for widespread species in the Project area o Conduct a census to evaluate distribution and population trends for RTE plant species with limited distribution in the Project area o Update the Project GIS database following each survey or census and coordinate with the TRWG to ensure that RTE plan data are current o Conduct comprehensive RTE plant survey if a catastrophic event occurs in the Project area	NA	NA	$1,798,782	Per TRMP Impl. Schedule [TRMP Appendix 2]	$72,588	$72,588
Botanical Resources Total:	**NA**	**NA**	**--**	**--**	**$179,302**	**$179,302**

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost [3]**	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
WILDLIFE RESOURCES						
• Implement Wildlife Program (a component of the TRMP): o Monitor bald eagle nest use and productivity within the Project boundary o Develop and implement management plans for bald eagle nest sites documented within the Project boundary o Monitor RTE wildlife species, specifically for the peregrine falcon and bank swallow	NA	NA	$2,78,374	Per TRMP Impl. Schedule [TRMP Appendix 2]	$110,101	$110,101
• Implement Habitat Management, Enhancement and Protection Program (a component of the TRMP):						
o Motorized vehicle access control	$175,000	$7,062	$5,119	Per TRMP Impl. Schedule [TRMP Appendix 2]	$606	$7,668
o Assess, identify, implement and monitor (as needed) various wetland/riparian, riparian and upland habitat protection and enhancement measures on SCL-owned Project Habitat Lands in the Project boundary (includes the incorporation into the Project boundary of the BWP Addition [89 acres], portions of three SCL-owned parcels that currently reside outside the Project boundary [Tailrace East (86.9 acres), Everett Creek (82.7 acres), and Sullivan Creek (17.7 acres)], and additional property, to be acquired with a target area of approximately 158 acres and approximately 13,022 lineal feet of land immediately adjacent to water – also identified under Geology/Soils, Botanical Resources, and Recreation and Land Use)	$1,704,000	$68,764	$235,469	Per TRMP Impl. Schedule [TRMP Appendix 2]	$9,502	$78,266
o Island and shoreline access control, to include measures to protect Canada goose nests on Metaline Island and Rat Island from human disturbance and limit recreational use at other sites along the reservoir to protect ecological values	$40,000	$1,614	$25,000	Per TRMP Impl. Schedule [TRMP Appendix 2]	$5,490	$7,104
Wildlife Resources Total:	**$1,919,000**	**$77,440**	**--**	**--**	**$125,700**	**$203,139**

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost [3]**	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
THREATENED AND ENDANGERED SPECIES						
• Addressed by Wildlife and Fish and Aquatics measures	See above	See above	See above	See above	See above	See above
AESTHETICS/VISUAL RESOURCES						
• Implement aesthetic/visual resource management guidelines for future Project recreation facilities (to be included in the RRMP)	See Recreation and Land Use below	See Recreation and Land Use below	See Recreation and Land Use below	See Recreation and Land Use below	See Recreation and Land Use below	See Recreation and Land Use below
CULTURAL RESOURCES						
• Implement an HPMP: o Reporting and consultation with Cultural Resources Work Group (CRWG)	NA	NA	$3,500	Annual	$3,500	$3,500
• Appointment and training of a staff HPMP Coordinator in historic properties management and current regulations to direct the implementation of this plan during the term of the new license; training by the Coordinator of Project employees, training of River Ranger	NA	NA	$1,000	Annual	$1,000	$1,000
• Historic properties treatment of three National Register of Historic Places (NRHP)-eligible properties (the Josephine Mine Historic Mining District, the Pend Oreille Mines and Metals Company [POMMC] Powerhouse Historic District and the Carl Harvey Homestead) through the integrated I&E Program (a component of the RRMP)	Included with I&E Program costs (Recreation / Land Use) below	See below	NA	NA	NA	See below
• HABS/HAER documentation of POMMC Powerhouse	NA	NA	$30,000	One-time (Within 5 Years of License Issuance)	$1,211	$1,211
• If Project effects associated with activities proposed during the term of the new license are anticipated to extend beyond the current Area of Potential Effect (APE) as defined in the HPMP, SCL will consult with the CRWG to amend the definition of the APE, and will initiate appropriate measures to inventory, assess, and evaluate cultural resources within the modified APE	NA	NA	$2,000	Annual	$2,000	$2,000

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost** [3]	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Monitoring of the historic archeological sites identified above and two prehistoric archaeological sites (45PO581 and 45PO583)	NA	NA	$1,500	Annual	$1,500	$1,500
• Monitoring following extreme high-water events if erosion is known to occur in the vicinity of the pre-historic sites (depends on flow conditions and the Cultural Resources Work Group decisions following license issuance)	NA	NA	$750	Annual	$750	$750
• Evaluate the Project for National Register of Historic Places (NRHP) eligibility when 50 years old (i.e., 2016)	NA	NA	$25,000	One-time	$1,009	$1,009
Cultural Resources Total:	**$0**	**$0**	**--**	**--**	**$10,969**	**$10,969**
RECREATION RESOURCES AND LAND USE						
• Finalize a Recreation Resources Management Plan (RRMP) that encompasses all recreation-related PM&E measures:	NA	NA	Included in RRMP implementation cost below	See below	See below	See below
• Implement a RRMP: o Reporting and consultation with Recreation Resources Work Group (RRWG)	NA	NA	$10,000	Annual	$10,000	$10,000

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost** [3]	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Improve recreational facilities at developed recreation sites. Proposed measures include:			O&M costs included under Operations and Maintenance Program below	See below	See below	See below
o Boundary Forebay Recreation Area – Enhance campground facilities and day-use picnic areas, extend an existing boat ramp lane, provide additional I&E signage, and provide ADA-accessible facilities	$2,360,682	$95,263				$95,263
o Boundary Vista House Recreation Area – Add I&E signage, provide ADA-accessible facilities	$244,071	$9,849				$9,849
o Boundary Tailrace Recreation Area/Machine Hall Visitors' Gallery – Update I&E signage and displays at the Machine Hall Visitors Gallery to the extent consistent with the level of anticipated use and security restrictions and provide ADA-accessible facilities	$324,053	$13,077				$13,077
o Metaline Waterfront Park Boat Launch – Replace the existing boat launch, extend a boat ramp lane, provide adequate gravel roadway access to the boat ramp, improve parking, provide an accessible dual vault restroom in the vicinity of the boat launch parking area and provide ADA-accessible facilities	$1,636,228	$66,029				$66,029

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost** [3]	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Development of new recreation sites. Proposed measures include:			O&M costs included under Operations and Maintenance Program below	See below	See below	
o Peewee Falls Viewpoint and Trail – Extend existing NFS road 3165-315, as needed, and develop a new trailhead at the end of the road, a trail, and a view point of Peewee Falls (the trailhead, trail, and viewpoint will be ADA-accessible), and develop appropriate support facilities, including ADA-accessible parking, vault toilet, and signage	$202,000	$8,152				$8,152
o Metaline Falls Portage Trail and Boaters Access – Develop a new portage trail in the vicinity of Metaline Falls, provide I&E signage, and construct a non-motorized boat access at the northern terminus of the portage trail, to include parking, appropriate signage, and restrooms	$274,305	$11,069				$11,069
o Riverside Mine Canyon Viewpoint and Trail -- Develop a new trail and trailhead in the vicinity of the Riverside Mine to a viewpoint of the canyon (trail alignment to take advantage of the existing NFS road network in this area, specifically NFS Road 3100-172, and trailhead, trail, and viewpoint will be ADA-accessible), and develop appropriate support facilities, including ADA-accessible parking, vault toilet, and signage	$211,000	$8,515				$8,515
o Eastside Trail – Construct a trail (to USFS standards) that connects the Peewee Falls and Riverside Mine Canyon viewpoints (to be designed and managed to meet semi-primitive non-motorized standards and take advantage of trailhead facilities at both the Peewee Falls and Riverside Mine Canyon trailheads)	$581,984	$23,485				$23,485
o Designated Dispersed Shoreline Recreation Sites – Enhance six shoreline recreation sites (3 BLM and 3 USFS) to accommodate boat-in camping and day use	$252,027	$10,170				$10,170
• Over the term of the license, replace and/or significantly repair various recreation site facilities, infrastructure, and amenities, based on periodic monitoring	NA	NA	$60,000	Annual	$60,000	$60,000

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost** [3]	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Implement a Shoreline Dispersed Recreation Management Program (a component of the RRMP)	Capital costs included under recreation facility improvements above	See above	O&M costs included under O&M Program below	See below	See below	See above and below
• Implement an Operations and Maintenance Program (a component of the RRMP): o Covering all SCL-managed recreation sites and use areas (developed and dispersed) o Providing annual maintenance at the boat launch at Metaline Waterfront Park o Periodically re-assessing the public access and security policies and needs at the Tailrace Recreation Area and Machine Halls Visitors Gallery	NA	NA	$82,800	Annual	$82,800	$82,800
• Implement a Recreation Monitoring Program (a component of the RRMP), to include seasonal (Memorial Day through Labor Day) River Ranger to help monitor site and resource conditions at the 16 designated shoreline sites	NA	NA	$32,400	Annual	$32,400	$32,400
• Develop and implement a multi-resource I&E Program (a component of the RRMP) [9]	NA	NA	$200,000	Within 10 Years of License Issuance	$8,071	$8,071
• Participate in the development of regional water trail program on the Pend Oreille River	NA	NA	$15,000	One-time	$605	$605

[9] This program addresses I&E needs for recreation resources, aesthetics/visual resources, geology and soils, engineering, fish and aquatics resources, cultural resources, botanical resources and wildlife resources.

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost** [3]	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Implement Shoreline Management Program (a component of the TRMP): o Define and map Project shoreline land use designations, allowed uses, and required approvals; and apply these designations to Project lands and waters o Develop, implement and monitor use of guidelines for private shoreline facilities along the Boundary Reservoir shoreline o Periodically remove shoreline debris o Develop and implement a Project public safety and education program	$141,282	$5,701	NA	NA	NA	$5,701
• Implement Travel and Public Access Management Program (a component of the RRMP): o Develop a Project Road Maintenance Plan o Provide adequate operational access to Project hydroelectric facilities and operations areas o Restrict and manage public access at or near certain Project facilities and hazardous operational areas for security and safety reasons o Provide adequate public access to Project recreation facilities and use areas	$510,000	$20,581	NA	NA	NA	$20,581
• Implement ongoing road maintenance	$90,000 (major maintenance every 15 years)	$3,632	$15,000	Annual	$15,000	$18,632
• Implement a Monitoring Well and Road Decommissioning Plan: o Decommission well heads and associated roads o Monitor to ensure adequate vegetation recovery	$305,000	$12,308	$5,000	One-time	$202	$12,510
• Adjustments to the current FERC Project boundary to include Project-related facilities, lands and roads that are currently outside of the Project boundary (changes are detailed in Exhibit G)	$500,000	$20,177	NA	NA	NA	$20,177

	Capital		O&M			
Proposed PM&E	**Estimated Cost**	**Annualized Cost** [3]	**Estimated Cost**	**Frequency**	**Annualized Cost**	**Total Annualized Cost**
• Re-establish the Public Land Survey System Corners, or establish witness corners governing National Forest System property boundaries within and adjacent to the Project area, survey, mark and post to USDA Forest Service standards and specifications those National Forest System lands adjacent to the Project and post Project Boundary signs at all public access points at the Project boundary, informing the public of the location of the boundary	NA	NA	$50,000	One-time	$2,018	$2,018
Recreation Resources and Land Use Total:	**$7,632,632**	**$308,009**	**--**	**--**	**$211,096**	**$519,104**
SOCIOECONOMICS RESOURCES						
• Addressed by measures of other resource areas	See above	See above	See above	See above	See above	See above
TRIBAL RESOURCES						
• Addressed by measures of other resource areas	See above	See above	See above	See above	See above	See above
Operational PM&E Measures Subtotal:	**NA**	**NA**	**$0**	**Annual**	**$0**	**$0**
Non-operational PM&E Measures Subtotal:	**$189,422,821**	**$7,644,002**	**--**	**--**	**$6,913,298**	**$14,557,298**
Grand Total:	**$189,422,821**	**$7,644,002**	**--**	**--**	**$6,913,298**	**$14,557,298**

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