Wallowa Falls Hydroelectric Project
FERC No. P-308

Before the
United States of America
Federal Energy Regulatory Commission

Final License Application for Minor Water Power Project with Modification to Proposed Action

Volume I of V
Initial Statement and Exhibits A and G

PACIFICORP ENERGY
A DIVISION OF PACIFICORP

February 2015

This page intentionally left blank.

Wallowa Falls Hydroelectric Project FERC No. P-308

Before the
United States of America
Federal Energy Regulatory Commission

Final License Application for Minor Water Power Project with Modification to Proposed Action

Volume I of V
Initial Statement and Exhibits A and G

Prepared by:
PacifiCorp Energy
Hydro Resources
825 NE Multnomah, Suite 1500
Portland, OR 97232

February 2015

This page intentionally left blank.

Wallowa Falls Hydroelectric Project
(FERC No. P-308)

FINAL LICENSE APPLICATION
for MINOR WATER POWER PROJECT WITH MODIFICATION to PROPOSED ACTION

CONTENTS OF VOLUMES

This final license application for the Wallowa Falls Hydroelectric Project (FERC No. P-308) consists of the following volumes:

Volume I

Initial Statement
Exhibit A – Project Description
Exhibit G – Project Maps

Volume II

Exhibit E – Environmental Report

Volume III

Exhibit E Appendices

Volume IV

Exhibit F – General and Preliminary Design Drawings (CEII)

Volume V

Cultural Recources – Traditional Cultural Properties (CONFIDENTIAL)
Filed with the FERC on February 28, 2014

This page intentionally left blank.

Initial Statement

Wallowa Falls Hydroelectric Project (FERC No. P-308)

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

PacifiCorp Energy Project No. 308

UPDATED INFORMATION to INITIAL STATEMENT FOR THE WALLOWA FALLS HYDROELECTRIC PROJECT (FERC NO. 308) FINAL LICENSE APPLICATION WITH MODIFICATION TO THE PROPOSED PROJECT

(February 10, 2015)

a. PacifiCorp Energy (PacifiCorp), a corporation under the laws of the State of Oregon and having its executive offices and principal place of business at Portland, in the State of Oregon, also referred to herein as "Applicant", is hereby updating its application, with modification to the proposed action, to the Federal Energy Regulatory Commission (FERC) for a new (subsequent) 50 year license for the Wallowa Falls Hydroelectric Project (Project) FERC Project No. 308, as described hereinafter. PacifiCorp requests a new license term of 50 years. The following updated license application information has been prepared in accordance with Chapter 18 of the Code of Federal Regulations (CFR) Section 4.61, license for Minor Project, Existing Dam, and 18 CFR Section 5.18 Application Content.

b. Date filed: Original Application – February 28, 2014. Application with Modification to Proposed Project - February 10, 2015

All information submitted in the February 28, 2014 license application Initial Statement paragraphs c through g is current and valid and is not provided here.

h. Pursuant to 18 CFR Section 5.18(a)(3)(i), Applicant has made a good faith effort to give notification of the filing with the Commission of the, application for new license-with modification to proposed project, by certified mail to the only known property owner of record of interest in the property within the Project boundary. The notification included the name, address and telephone number of the applicant and a copy of Exhibit G. The only known property owner of record of interest in the property within the Project boundary as listed below.

Boy Scouts of America
Rich Szymanski
Scout Executive Director
Blue Mountain Council
8478 West Gage Blvd
Kennewick, WA 99336

(509) 735-7306

All information submitted in the February 28, 2014 license application Initial Statement paragraphs i and j is current and valid and is not provided here.

k. Project Description:

- The Project was initially constructed in 1921 by the Enterprise Electric Company. The existing facilities include; a diversion dam on Royal Purple Creek, a rock-filled timber crib dam on the East Fork Wallowa River, a 0.2-surface-acre (0.08 ha) forebay, a 5,688-foot-long (1,734 m) steel penstock, a powerhouse containing a 1,500 hp impulse turbine and single generating unit operating under a head of 1,168 feet (356 m) producing an average annual energy output of 7.0 GWh, and a 40 foot-long concrete lined tailrace flume connected to a 2,305 foot-long (702 m), unlined tailrace channel discharging into the West Fork Wallowa River.

- Existing and proposed installed generating capacity is 1,375 kVA (1,100 kW).

- Existing dam was rebuilt in 1994.

Surveyed lands of the United States affected (shown on Exhibit G):

	Name	**Acres**
National Forest	Wallowa-Whitman	12.7
Indian Reservation	NA	0
Public Lands Under Jurisdiction of	NA	0
Other	NA	0
Total U.S. lands		12.7

l. The Project is fully operational in its current configuration under the existing license. Construction of the proposed Project facilities as described in Exhibits A and E, is planned to start within 36 months, and is planned to be completed within 48 months, from the date of issuance of the license.

SUBSCRIPTION

This updated Final License Application with Modification to the Proposed Action for the Wallowa Falls Project, FERC No. P-308 is executed in the State of Oregon, County of Multnomah, by Todd Olson, Director, Compliance Hydro Resources, PacifiCorp Energy, 825 NE Multnomah St., Suite 1500, Portland, Oregon, 97232, who, being duly sworn, deposes and says that the contents of this application are true to the best of his/her knowledge or belief and that he/she is authorized to execute this application on behalf of PacifiCorp Energy. The undersigned has signed his application this 10 day of February, 2015.

Todd Olson - Director, Compliance Hydro Resources

VERIFICATION

Subscribed and sworn to before me, a Notary Public of the State of Oregon this 10 day of February, 2015.

Notary Public – Arianne Poindexter

My Commission Expires March 5, 2018

OFFICIAL STAMP
ARIANNE N POINDEXTER
NOTARY PUBLIC - OREGON
COMMISSION NO. 925807
MY COMMISSION EXPIRES MARCH 05, 2018

EXHIBIT A – PROJECT DESCRIPTION

Wallowa Falls Hydroelectric Project (FERC No. P-308)

Introduction

The Project was initially constructed in 1921 by the Enterprise Electric Company with a generating capacity of 800 kilovolts (kVA). The original license was issued on June 27, 1924 and expired on March 31, 1974. On October 19, 1928 the Commission approved the transfer of the license to the Inland Power and Light Company. By order dated November 23, 1942, the Commission approved the transfer of the license from Inland Power and Light Company to Pacific Power and Light Company[1]. At the time of completion, the Project replaced several small generation sources in the Wallowa Valley and was connected to an existing transmission line servicing the communities of Joseph, Enterprise, Lostine and Wallowa. By order issued April 8, 1929 the Commission amended the license to include the construction of minor Project works for the diversion of water from Royal Purple Creek. In 1967 the original generator was replaced with a new 1,375 kVA (1,100 kW) unit which is still in service. By order dated March 29, 1976 the Commission issued a new license for the Project for a period of ten years. The current license was issued on August 28, 1986 for a period of thirty years. Detailed maps showing lands and waters within the existing and proposed Project boundary, land ownership and Project facilities are provided in Volume I, Exhibit G and Volume III, Appendix A.

On February 28, 2014, PacifiCorp Energy (PacifiCorp) filed an application for subsequent (new) minor license with the Commission. Several letters commenting on the February 28, 2014 license application were filed with FERC in the spring and summer of 2014. The comments raised concerns that PacifiCorp's proposal to reroute the Project tailrace to discharge into the East Fork Wallowa River could exacerbate flooding risk to private property along the East Fork Wallowa River. In a letter to PacifiCorp dated July 24, 2014 the Commission requested additional information to address the issue of potential flooding caused by the proposed Project. In the course of preparing the response to FERC's request, PacifiCorp concluded that the proposed tailrace reroute will result in an increased potential for downstream flooding in the East Fork bypassed reach in an area with nearby housing and county infrastructure.

To reduce the potential flooding associated with future Project operations, but also in consideration of environmental impacts, PacifiCorp identified an alternative tailrace route and discharge. This new tailrace alternative will extend farther downstream than the existing tailrace channel alignment/discharge point to an area of the West Fork Wallowa River with more-stable banks that will not be as susceptible to channel migration. In a letter dated November 24, 2014, PacifiCorp informed the Commission of our intent to modify our proposed Project. This document supersedes the information provided in Exhibit A filed on February 28, 2014 and includes an updated description of PacifiCorp's modified proposed action and Project costs, benefits, and power values.

Purpose of Project

[1] Pacific Power and Light Company is a prior company name of PacifiCorp Energy.

Continued operation of the Project as proposed under a new license would provide renewable hydroelectric generation to meet a portion of local power requirements, resource diversity, and capacity needs in a remote rural area (Wallowa County, Oregon) of PacifiCorp's service territory. The Project would have an installed capacity of 1,375 kVA (1,100 kW) and generate approximately 5,188,000 kWh per year assuming a minimum in-stream flow release from the Project of 4 cubic feet per second (cfs) from November through April, and 5 cfs May through October into the East Fork Wallowa River.

Existing Project Facilities

All information submitted in the February 28, 2014 license application Exhibit A-Existing Project Facilities section is current and valid and is not provided here.

Existing Project Operation

All information submitted in the February 28, 2014 license application Exhibit A-Existing Project Operation section is current and valid and is not provided here.

Proposed Project Facilities

Tailrace Realignment

PacifiCorp proposes to modify the Project tailrace from its current configuration by permanently dewatering the existing southern main tailrace channel and realigning the tailrace north to discharge into the West Fork farther downstream. Two conceptual design drawings of the tailrace realignment and outfall structure are provided in the updated application Volume III - Appendix C. The proposed tailrace configuration will use the current concrete lined flume immediately adjacent to the powerhouse and the current unlined portion of the tailrace from the concrete lined flume to the point where it bisects, approximately 200 feet (61 m) below the concrete lined flume. At the point where the existing unlined channel bisects, all flow into the southern main tailrace channel will be blocked and approximately 700 feet (213 m) of the northern side channel improved to carry the full powerhouse discharge. As noted in Section 2.1.1, the northern side channel is braided in several places. These braided sections will be abandoned and the channel widened and deepened to convey full powerhouse flow. The final 100 feet (30 m) of the northern side channel currently turns sharply to the northwest and discharges into the West Fork. This portion of the channel will be abandoned and approximately 275 feet (84 m) of new open channel running further downstream will be constructed. A reinforced concrete outfall structure will be constructed where the new unlined channel discharges into the West Fork Wallowa River.

The realigned open excavated tailrace channel will discharge full powerhouse flows approximately 350 feet (107 m) farther downstream than the existing tailrace channel alignment/discharge point to a more stable active side channel of the West Fork. This discharge location will be much less susceptible to channel migration than the current tailrace configuration.

The outfall structure will include a velocity barrier which meets the requirements of Section 5.4 – Velocity Barriers in the 2011 NMFS Anadromous Salmonid Passage Facility Design (NMFS 2011) to prevent all fish species and life stages from entering the tailrace. The barrier structure will be designed to meet NMFS criteria at flows up to the ordinary high water elevation. During higher flows fish are seeking refuge and do not typically migrate. Fish exclusion specific to the species and life stages present during high flows will be evaluated during the final design. The structure will be designed for a minimum drop of 3-feet, 6-inches (1.06 meters). The outfall structure will discharge into an energy dissipation channel consisting of boulders, logs and/or woody debris to reduce erosion and scour in the West Fork Wallowa River. The boulders are anticipated to have a maximum size of 12-inches, but the final size and details will be determined during final design. It is anticipated that the hydraulic energy will be dissipated in the energy dissipation channel (10-20 feet long), although the improvements may extend into the West Fork side channel. No work is anticipated in the main channel.

Once the tailrace realignment is constructed and put into operation, the southern main channel and abandoned portion of the northern side channel, which currently discharges to the West Fork Wallowa River, will no longer be needed for hydroelectric operations. The southern main tailrace channel will be retained to provide stormwater management and drainage in the area. The abandoned portions of the northern tailrace side channels on the north side of the campground road will be reclaimed and restored to match surrounding contours.

Relocate Gage for Project Flow Monitoring

PacifiCorp proposes to relocate the gage to monitor instream flows in the East Fork bypassed reach to the historic USGS gage weir-site approximately 1,000 feet (305 m) upstream of the confluence with the West Fork. The data obtained from the new gage site will provide verification that proposed modified instream flow releases to the East Fork bypassed reach are being implemented as planned in the portion of the bypassed reach with the greatest use by aquatic organisms.

PacifiCorp currently maintains a gage immediately downstream from the Project Diversion dam that serves as the existing compliance point for monitoring instream flow releases to the East Fork. The currently abandoned USGS gage weir is located in the East Fork bypassed reach approximately 0.7 mi downstream of the Project Diversion dam off of State Highway 351 (see Appendix A for a map showing the proposed gage location). Several attributes make this location advantageous and preferable, including that this location: (1) is located below the migratory fish barrier and will report flow conditions in bull trout critical habitat; (2) avoids construction in the high-gradient turbulent East Fork Wallowa River where it has proven difficult to construct and maintain a gage; (3) is easily accessible for efficient and timely maintenance of the gage and downloading of data; and (4) requires no in-water construction as the existing weir structure is fully functional. (5) the existing weir has a proven ability to effectively pass sediment and floating debris (e.g., woody debris), which is a particularly important advantage for the East Fork bypassed reach.

PacifiCorp does not believe the abandoned USGS gage weir presents a significant upstream fish migration barrier. In 2013, a bull trout that had been previously captured and PIT tagged from within the Project tailrace in 2012, was recaptured above the weir. Additionally, migratory sized adult bull trout have been documented (PacifiCorp, 2013d) above the weir. While this location is clearly not a total upstream fish migration barrier, it may be impedance and/or delay to upstream migration at certain flows to certain fish species and life-stages.

Flow measurement accuracy is particularly important at the lower end of the flow range to verify the proposed seasonal instream flow releases to the East Fork bypassed reach as described in Section 2.2.2 below. The gage equipment will include a water level pressure transducer and data logger for continuous (hourly) recording of water levels and flows. A daily average will then be calculated and recorded from the hourly data. PacifiCorp will continue the current practice of filing a daily average report of stream flow in the bypassed reach annually with FERC and the appropriate agencies.

PacifiCorp and\or responsible contractors will obtain necessary approvals and permits for equipment installation and implementation. PacifiCorp or responsible contractors will adhere to and implement the requirements of necessary approvals and permits.

Proposed Project Boundary

PacifiCorp proposes to revise the Project boundary to include the proposed tailrace alignment and other appropriate Project features that are not in the current boundary such as the Royal Purple diversion and forebay access road. The proposed Project boundary occupies a total of 26.4 acres (10.7 ha), 13.3 acres (5.4 ha) of private land owned by PacifiCorp, 0.4 acres (0.2 ha) of private land owned by the Boy Scouts of America, and 12.7 acres (5.1 ha) of federal land managed by the WWNF. Maps showing the current and proposed Project boundary are provided in Volume 1, Exhibit G and Volume III, Appendix A.

Proposed Project Operation

The Project would continue to be operated in run-of-river mode during all times of generation. The automated control system equipment would be set to divert no more than PacifiCorp's water right of 16 cfs, from the East Fork Wallowa River. No ramping rates or other ramping restrictions are proposed at this time.

PacifiCorp will continue to operate the Project with the current tailrace configuration until June following the third anniversary of FERC license issuance. During this time, PacifiCorp will design, permit and construct the proposed tailrace realignment project. Although PacifiCorp plans to construct the tailrace realignment and associated outfall structure between June and September of the third year following license issuance, to minimize effects to water quality and aquatic species, the new tailrace will not be put into operation until the seasonal high-flow period (June) following construction completion.

During the three-year 'interim operations' period, when the current tailrace configuration will be used, PacifiCorp will continue to conduct a fish salvage of all tailrace channels anytime there is a planned or unplanned dewatering of the tailrace. As described in Section 2.1.3 there are limited operational scenarios under which the tailrace channels become completely dewatered. To further protect bull trout and kokanee, a fish exclusion weir will be installed annually prior to September 1, at the confluence of the tailrace with the West Fork Wallowa River to prevent fish spawning in the tailrace channels. A fish salvage of the tailrace channels will be completed prior to installation to ensure no fish are stranded in the tailrace behind the weir. The weir will be left in place through November 15, and will be monitored twice per week for the duration of installation period to assure performance. Agencies with fish and wildlife management responsibilities will be notified of all efforts to protect fish species such as installation and removal of the temporary tailrace weir, during the three-year interim operations period.

Beginning in June following the completion of the proposed tailrace realignment configuration, the new tailrace will be used for the discharge of all generation flows to the West Fork Wallowa River under all operating conditions.

Sediment Management Program

It is necessary to flush accumulated native sediment from the Wallowa Falls Hydroelectric Project forebay to prevent damage to the hydroelectric generating unit and continue operation of the Project. PacifiCorp proposes to modify the historic practice of flushing entrained native sediment from the forebay during the summer low-flow period to flushing sediment from the forebay during spring-runoff in the month of June. Annual forebay flushing will result in the removal of accumulated sediment from the forebay and the mobilization and transport of that sediment into the bypassed reach of the East Fork Wallowa River. Based on a volumetric survey of native sediment entrained in the forebay in August 2012, conducted by Haner, Ross and Sporseen, P.C, approximately 250 to 500 cubic yards of native material will be flushed annually.

Sediment Management Schedule and Timing

Sediment would be flushed routinely, likely annually, from the Project forebay during the month of June when seasonal high-flows would easily transport fine sediment through the bypassed reach. June is also the period identified as having the least potential impact to fish, as both kokanee and bull trout fry have emerged from the gravel and it is well before the fall spawning period for both species.

There is no real-time stream gaging or communications capabilities at the Project, and given the remoteness of the Project, PacifiCorp does not have the ability to schedule forebay flushing in response to real time flows. However, it is PacifiCorp's intent to flush prior to or during the annual high flow period in the East Fork, which historically occurs in June. To reduce uncertainty around the adequacy of June flows, we propose a threshold flow, above which mobilization of small (<2 mm) particles would be expected to occur within the East Fork Wallowa River bypassed reach. Based on the analysis provided in Section 3.3.1 of Exhibit E, PacifiCorp proposes to conduct flushing during June, as early in the high flow

season (to allow subsequent peak flows to transport sediment) as possible and not at flows less than 15 cfs, as measured at the proposed compliance point, and to the extent possible at flows above 20 cfs[2].

If the forebay is not flushed during a given year due to low flows, site access issues or operational or maintenance issues it will not be flushed until June of following year. Agencies with fish and wildlife management responsibilities will be notified if forebay flushing does not occur in any given year. If forebay flushing does not occur two years in a row, PacifiCorp will consult with the fish and wildlife agencies to discuss options for forebay flushing that minimize adverse effects to bull trout and critical habitat downstream in the East Fork and West Fork Wallowa Rivers

Sediment Management Flushing Method
Sediment retained in the Project forebay would be flushed through or over the dam, via the low-level outlet pipe or the dam spillway respectively, into the bypassed reach of the East Fork Wallowa River. To facilitate flushing, the penstock intake gate would be closed and the slide gate on the low-level pipe at the base of the diversion dam would be fully opened. Project inflow, up to the hydraulic capacity of the pipe, would pass through the low-level outlet pipe. Project inflows in excess of the hydraulic capacity of the low-level outlet pipe would spill over the dam. Several people operating hydraulic pumps (fire pumps) with hoses affixed to rigid poles would be stationed around the perimeter of the forebay. The pump hoses would be used to hydraulically mobilize and suspend forebay sediments in the water column to facilitate sediment transport through the low-level outlet pipe or over the dam into the bypassed reach. Flushing would not exceed 72 hours. At the end of the flushing period, the low-level outlet pipe slide gate would be closed and the penstock gate re-opened to resume generation and normal Project operation.

Sediment Management Monitoring
It is expected that there will be short-term increases in turbidity during forebay flushing; PacifiCorp will monitor turbidity as described in the Turbidity Monitoring Plan for Forebay Maintenance Flushing included in Volume III, Appendix D.

Project Costs, Benefits, and Power Values

The information below includes the following: (1) an estimate of the net power benefit of the Project for two licensing alternatives, no-action (existing Project) and PacifiCorp's proposed Project; and (2) an estimate of the cost of individual measures proposed for the protection, mitigation and enhancement of environmental resources affected by the Project.

To determine the net power benefit for the proposed Project, we compare Project costs to the value of the power output as represented by the cost of a likely alternative source of power in the region. A positive net annual power benefit indicates that the Project power costs less than the current cost of alternative generation resources and a negative net annual benefit indicates that Project power costs more than the current cost of alternative

[2] Average flows in the East Fork in June are approximately 60 cfs.

generation resources. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license.

Power and Economic Benefits of the Project

Table 1 summarizes the assumptions and economic information used in the analysis. This information was derived from PacifiCorp internal records. Cost items common to both alternatives include: taxes and insurance costs; net investment (the total investment in power plant facilities remaining to be depreciated); estimated future capital investment required to maintain and extend the life of plant equipment and facilities; relicensing costs; normal operation and maintenance costs, and Commission fees.

Table 1. Parameters for economic analysis of the Wallowa Falls Project (Source: PacifiCorp).

Parameter	Value	
Period of analysis (years)	41	
Taxes and insurance (%) (a)	NA	
Federal income tax rate	37.951%	
Levy rate	1.06%	
Assessment rate	100%	
Insurance	NA	
Net investment, $ (b)	$697,000	
Original Cost $ (c)	$3,224,974	
Future major capital cost, $ (d)	$3,211,000	
Relicensing cost, $ (e)	$2,599,000	
Operation and maintenance, $/year (f)	$113,000	
Commission fees, $/year (g)	$199	
Energy value current Project (MWh)	Peak - 0.5 cfs Minimum Instream Release	Off-Peak - 0.5 cfs Minimum Instream Release
January	435	242
February	429	239
March	441	246
April	496	276
May	609	339
June	780	434
July	630	351
August	613	341
September	657	366
October	604	336
November	541	301
December	583	325
Capacity value ($/MW-year)	NA	
Interest rate (h)	7.52%	
Discount rate	6.56%	

a PacifiCorp is self-insured.

b Net investment, or net book value, is the depreciated project investment allocated to power purposes.

c Original cost is the total undepreciated net investment cost.

d Future major capital costs include major plant rehabilitation to maintain present-day capability scheduled between 2016 and 2046 and are expressed as a present value.

e Relicensing costs include the administrative, legal/study, and other expenses to date.

f Existing plant operation and maintenance includes operation and maintenance related to environmental measures associated with the current license.

g Commission fees are based on statements of annual charges received from the Commission for federal lands and administrative charges based on authorized capacity.

h Based on PacifiCorp's weighted average cost of capital.

As currently operated, the 1,100 kW Wallowa Falls Project generates an average of 6,819,000 kWh annually. Table 1 includes monthly values for generation under high-load period (peak) and low-load period (off-peak) conditions. These values represent PacifiCorp's marginal cost of generation as determined by system load and generation resource simulation. They reflect the cost of a mixture of generation resources available to PacifiCorp. We use monthly variable peak and off-peak energy values for our analysis in order to estimate the cost (in lost energy value) of minimum in-stream flow measures.

Comparison of Alternatives

Table 2 summarizes the annual cost, power benefits, and annual net benefits for the two alternatives considered in this Exhibit E: no-action, and PacifiCorp's proposal.

Table 2. Summary of the annual cost, power benefits and annual net benefits for the no-action alternative and proposed Wallowa Falls Project.

	No Action	Proposed Project
Installed Capacity (kW)	1,100	1,100
Annual Generation (kWh)	6,817,000	5,188,000 (assumes a minimum in-stream release of 4\5 cfs)
Annual Power Value (a)	$49.87	$49.87
($/MWh and mills/kWh		
Annual cost	$56.83	$132.08
($/MWh and mills/kWh)		
Annual net benefit/(Cost)	$(6.96)	$(82.21)
($/MWh and mills/kWh)		
a PacifiCorp produces an "official" 30 year market power price forecast at the end of each quarter which is used in the company's financial analysis models. To compute the remaining 11 years in the analysis, the final year values are inflation adjusted for each subsequent year. The $49.87 value is the result of the 41 year nominal levelized computation of the Mid-Columbia market power price forecast dated December 31, 2014.		

No-action Alternative

Under the no-action alternative, the project would continue to operate as it does now. The project generates an average of 6,819 MWh of electricity annually. The levelized annual

power value of the project under the no-action alternative would be $340,000 (about $49.87 per MWh). The levelized annual cost of producing this power will be $387,000 (about $56.83 per MWh), resulting in a levelized annual net cost of $47,000 (about $6.96 per MWh). In other words, the project produces energy at a cost that is slightly more than that of currently available alternative generation by $6.96 MWh.

PacifiCorp's Proposed Project

PacifiCorp proposes to continue operating the existing equipment in a run-of river mode. The minimum in-stream flow as measured at the compliance gage will be increased from 0.5 cfs to 4 cfs from November 1, through April 30, and 5 cfs May 1, through October 31 (4\5 cfs). Under the proposed minimum in-stream flow described above, the Project's estimated annual generation is 5,188,000 kWh, a decrease of 24 percent (1631 kWh), from the current annual generation of 6,819,000 kWh. In addition, PacifiCorp proposes to modify the Project tailrace from its current configuration by permanently dewatering the existing southern main tailrace channel and realigning the tailrace north to discharge into the West Fork farther downstream. The total cost of the tailrace realignment is estimated at $960,000. The total cost of implementing all of the measures proposed under a new license is $9,195,000 including capital, O&M and lost generation. The total relicensing process cost is $2,599,000. Assuming an average annual generation of 5,188 MWh under a new license, the proposed Wallowa Falls Project will have an average annual power value of $49.87 per MWh, an annual production cost (levelized over the 41-year period of analysis) of $132.08 per MWh, and an annual net cost of $82.21 per MWh. In other words, the project will produce energy at a cost that is $82.21 per MWh more than that of projected replacement market power. PacifiCorp is requesting a license term of 50 years to allow maximum cost recovery and provide favorable customer benefits over Project decommissioning.

Cost of Environmental Measures

Table 3 gives the cost of each of the environmental enhancement measures proposed. We convert all costs to equal annual (levelized) values over a 40-year license period to give a uniform basis for comparing the benefits of a particular measure to its cost. All costs have been rounded to the nearest $1,000 with the exception of levelized annual costs.

In order to meet the proposed minimum in-stream flow (MIF) release at the dam of 4\5 cubic feet per second, the low level outlet headgate will need to be modified or replaced. The $260,000 identified below will be specifically applied toward design, fabrication, and installation of the minimum release component of the low level outlet. In order to implement the proposed sediment management program for forebay flushing, the low level outlet superstructure will be replaced or retrofitted to more reliably open and close under hydraulic head. The $257,000 identified below will be specifically applied toward design, fabrication, and installation of the low level outlet superstructure. The total capital cost of improvements associated with the low level outlet is $517,000.

Table 3. Cost of environmental mitigation and enhancement measures considered in assessing the environmental effects of continuing to operate the Wallowa Falls Hydroelectric Project.

Enhancement/Mitigation Measure	Entities	Capital Costs	Operation and Maintenance, or annual cost item	Levelized annual cost of item
Proposed project facilities				
Tailrace realignment and fish barrier	PacifiCorp	$960,000	$1,000 annually, included in $130,000 annual O&M costs	$81,806
New in-stream flow compliance gage equipment at existing USGS weir-East Fork Wallowa River	PacifiCorp	$57,000	$1,000 annually, included in $130,000 annual O&M costs	$6,377
Replace flow monitoring equipment every 10 years (4x) at $30,000 per occurrence	PacifiCorp	$120,000	$0	$3,314
Proposed environmental measures				
Construction of proposed facilities				
All proposed environmental measures described in Section 2.2.3.1 are included in the total capital costs of $960,000 identified above for the tailrace realignment.				
Operation				
Provide a minimum in-stream flow of 4\5 cfs in the East Fork Wallowa River bypassed reach	PacifiCorp	$260,000 Modify existing low level outlet flow volume control equipment to provide new MIF	$110,000 Annual lost generation value	$104,397
Implement a sediment management program for forebay flushing of approx. 250 to 500 cubic yards of native sediment	PacifiCorp	$258,000 Modify existing low level outlet superstructure to operate under hydraulic head	$5,000 annually	$28,569
Conduct Geologic Hazard Assessment every 5 years (9x) at $25,000 per occurrence	PacifiCorp	$0	$225,000 total	$7,172
Geology, sediment and substrate				
BMPs for sediment and erosion control during tailrace realignment construction	PacifiCorp	$100,000 Included in the total capital costs above for the tailrace realignment	NA	$8,893
Implement a sediment management program for forebay flushing of approx. 250 to 500 cubic yards of native sediment	PacifiCorp	Provided in operation above	Provided in operation above	Provided in operation above
Conduct Geologic Hazard Assessment every 5 years	PacifiCorp	Provided in operation above	Provided in operation above	Provided in operation above

(9x) at $25,000 per occurrence				
Road Management Plan	PacifiCorp	$8,000 Included in total relicensing process costs	$1,000 annually, included in $130,000 annual O&M costs	$1,975
Extend Royal Purple Diversion Pipe to West Fork Wallowa River	PacifiCorp	$6,000	Provided in operation above	$489
Water resources				
BMPs for sediment and erosion control during new tailrace construction	PacifiCorp	Provided in geology, sediment and substrate above	Provided in geology, sediment and substrate above	Provided in geology, sediment and substrate above
Schedule commissioning of new tailrace during high flows	PacifiCorp	$0	NA	NA
Provide a minimum in-stream flow of 4\5 cfs in the East Fork Wallowa River bypassed reach	PacifiCorp	Provided in operation above	Provided in operation above	Provided in operation above
Instream flow compliance monitoring for bypassed reach	PacifiCorp	$0	$10,000 annually	$12,628
Implement a sediment management program for forebay flushing of approx. 250 to 500 cubic yards of native sediment	PacifiCorp	Provided in operation above	Provided in operation above	Provided in operation above
Implement a Turbidity Monitoring Plan for forebay flushing	PacifiCorp	$8,000 Included in total relicensing process costs	$5,000 annually	$7,026
Fish and aquatic resources				
BMPs for sediment and erosion control during new tailrace construction	PacifiCorp	Provided in geology, sediment and substrate above	Provided in geology, sediment and substrate above	Provided in geology, sediment and substrate above
Tailrace Realignment	PacifiCorp	Provided in proposed project facilities above	Provided in proposed project facilities above	Provided in proposed project facilities above
Schedule commissioning of new tailrace during high flows	PacifiCorp	$0	NA	NA
Conduct fish salvages as needed during 3 year interim operations period under a new license	PacifiCorp	NA	$10,000 each year for first 3 years under a new license	$1,867
Install fish exclusion weir in existing tailrace during bull trout spawning for 3 year interim operations period under a new license	PacifiCorp	NA	$10,000 each year for first 3 years under a new license	$1,867
Provide a minimum in-stream flow of 4\5 cfs in the	PacifiCorp	Provided in operation above	Provided in operation above	Provided in operation above

East Fork Wallowa River bypassed reach				
Conduct two bull trout genetics analyses in the East Fork Wallowa River	PacifiCorp	$0	$40,000 Total ($20,000 in 2018 & $20,000 in 2033)	$1,814
In-stream flow compliance monitoring for bypassed reach	PacifiCorp	Provided in operation above	Provided in operation above	Provided in operation above
Implement a sediment management program for forebay flushing of approx. 250 to 500 cubic yards of native sediment	PacifiCorp	Provided in operation above	Provided in operation above	Provided in operation above
Comply with Oregon State Aquatic Invasive Species Prevention Program Requirements	PacifiCorp	NA	$1,000 annually for all fish, invertebrate, and botanical species	$1,263
Wildlife and terrestrial resources				
Noxious weed management plan	PacifiCorp	$8,000 included in relicensing process costs	$10,000 for first two years, then $7,000 annually	$9.932
Vegetation Management plan	PacifiCorp	$5,000 included in relicensing process costs	$15,000 for first two years, then $10,000 annually	$13,708
BMPs for sediment and erosion control during tailrace realignment construction	PacifiCorp	Provided in geology, sediment and substrate above	Provided in geology, sediment and substrate above	Provided in geology, sediment and substrate above
Permit & mitigate wetland loss at tailrace realignment	PacifiCorp	$100,000 included in the total capital costs above for the tailrace realignment	$0	$8,893
Implement a sediment management program for forebay flushing of approx. 250 to 500 cubic yards of native sediment	PacifiCorp	Provided in operation above	Provided in operation above	Provided in operation above
Comply with Oregon State Aquatic Invasive Species Prevention Program Requirements	PacifiCorp	NA	Provided in fish and aquatic resources above	Provided in fish and aquatic resources above
Recreation resources				
Annual Coordination with Forest Service and OPRD	PacifiCorp	$0	$1,000 annually	$1,263
Campground Entry Sign	PacifiCorp	$3,000	$1,000 annually	$1,529
Install new campground host pad (300 sf), with full hook-up	PacifiCorp	$23,000	$1,000 annually	$3,308
Install new 2 room ADA	PacifiCorp	$140,000	$3,000 annually	$16,240

accessible flush toilet unit, sewage pump facilities, site preparation, electricity, water				
Install campsite identification signs	PacifiCorp	$2,000	$0	$177
Upgrade and restore campsite pads (one site will be ADA accessible)	PacifiCorp	$12,000	$1,000 annually	$2,330
Remove logs and stumps in campground	PacifiCorp	$4,000	$0	$355
Interpretive 3-panel sign near powerhouse	PacifiCorp	$22,000	$0	$1,956
Single panel trailhead sign with wilderness registration station: relocated away from powerhouse	PacifiCorp	$14,000	$0	$1,245
New trail from relocated trailhead to existing Forest Service trail system	PacifiCorp	$6,000	$1,000 annually	$1,796
Replace cable gate near powerhouse with a metal pipe-gate.	PacifiCorp	$6,000	$0s	$533
New access trail from campground west to overlook ridge and reclaim user created trails in area	PacifiCorp	$6,000	$1,000 annually	$1,796
New single panel trailhead sign at campground with wilderness registration station	PacifiCorp	$14,000	$1,000 annually	$2,508
Install six metal directional signs along forebay access road	PacifiCorp	$15,000	$0	$1,334
Improve drainage at access road-East Fork connector trail by installing a turnpike drainage structure per WWNF standards	PacifiCorp	$3,000	$0	$266
West side of forebay – single panel informational sign at East Fork Trail	PacifiCorp	$14,000	$0	$1,245
Aesthetic Resources				
Intake structure – wood shakes attached to the exterior and roof		$0	$2,000 in first license year only	$129
East Side of forebay – remove and reorganize existing PacifiCorp material storage area near storage shed	PacifiCorp	$0	$2,000 in first license year only	$129
West side of forebay – single panel informational	PacifiCorp	Provided in recreation measures	$0	Provided in recreation measures

sign at East Fork Trail		above		above
Upper penstock trestle – paint penstock and stain trestle consistent neutral color	PacifiCorp	$0	$30,000 one-time maintenance action in license-year 2	$1,866
Powerhouse – replace all fencing with black vinyl chain-link fencing.	PacifiCorp	$23,000	$1,000 annually, included in $130,000 annual O&M costs	$3,308
New Tailrace Outfall Structure – Install black vinyl chain-link fencing	PacifiCorp	$15,000 included in the total capital costs above for the tailrace realignment	$0	$1,334
Powerhouse – landscape approximately 2,500 sq. ft. between powerhouse and highway terminus.	PacifiCorp	$21,000	$2,000 each year for the first two years to get plants established	$2,122
Powerhouse – recoat or replace roof with dark, non-reflective color (at time of maintenance need)	PacifiCorp	$0	$18,000 one-time maintenance action in license-year 5	$983
Powerhouse – recoat or replace siding with dark or neutral color (at time of maintenance need)	PacifiCorp	$0	$40,000 one-time maintenance action in license-year 10	$1,760
Cultural Resources				
Implement an unanticipated discovery plan for cultural resources and human remains	PacifiCorp	$0 included in all capital project construction protocols	$1,000 annually, included in $130,000 annual O&M costs	$1,263
Monitoring of tailrace realignment and major recreation facility construction	PacifiCorp	$58,000	NA	$5,158

Measures to Ensure Safe Management, Operation, and Maintenance of the Project

All information submitted in the February 28, 2014 license application Exhibit A-Measures to Ensure Safe Management, Operation, and Maintenance of the Project section is current and valid and is not provided here.

Detailed Single-Line Electrical Diagram

The detailed Single-Line Electrical Diagram submitted in the February 28, 2014 license application Exhibit A- is current and valid and is not provided here.

References

NMFS (National Marine Fisheries Service). 2011. Anadromous Salmonid Passage Facility Design. NMFS, Northwest Region, Portland, Oregon.

PacifiCorp. 2011a. Wallowa Falls Hydroelectric Project FERC No. P-308 Notice of Intent to Relicense and Pre-Application Document. February 2011. Portland, Oregon.

PacifiCorp. 2011b. Response to Additional Information Request - Wallowa Falls Hydroelectric Project Outage Report from 3/1/1986 through 7/31/2011. Filed electronically with FERC on August 8, 2011.

PacifiCorp 2013d. Wallowa Falls Hydroelectric Project, FERC Project No. P-308, Updated Study Report (Final Technical Report), *Aquatic Resources.* http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Hydro/Hydro_Licensing/Wallowa%20Falls/03_WF_Aquatic_Resources_Updated_Study_Plan.pdf

Personal Communication between PacifiCorp and Mike Hayward, Wallowa County Commissioner, September 2010.

EXHIBIT G – PROJECT MAPS

(see link below)

http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Hydro/Hydro_Licensing/Wallowa%20Falls/WF_Exh_G_signed.pdf

Wallowa Falls Hydroelectric Project (FERC No. P-308)

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

PacifiCorp Energy Project No. 308

DESCRIPTION OF PROPOSED EXHIBIT G REVISIONS WALLOWA FALLS HYDROELECTRIC PROJECT (FERC NO. 308) FINAL LICENSE APPLICATION WITH MODIFICATION to PROPOSED ACTION

(February 10, 2015)

As part of the application for new license for the Wallow Falls Project (FERC No. 308), PacifiCorp is proposing to revise the current Exhibit G (Exhibit G-1, Project Area and Boundary, FERC drawing no. P-308-14) and modify the Project boundary to include proposed facilities and to more closely enclose only those lands necessary for the operation of the Project. Proposed substantive changes are discussed below.

Both the current and revised Exhibit G drawings are on a single sheet but the revised Exhibit G displays the Project boundary contiguously rather than in two parts used in the current Exhibit G.

The revised Project boundary includes all principal Project works necessary for operation and maintenance of the Project. It also incorporates the revised proposed tailrace alignment that will discharge Project flows into the West Fork Wallowa River.

Compared to the current boundary, the revised Project boundary is narrower near the Project dam and around the powerhouse but widens to include the Pacific Park Campground. Along the penstock, the boundary was slightly widened to incorporate the Project forebay access road.

The revised Project boundary is generally described by a series of 50-ft wide offsets from the centerline of continuous linear Project features (e.g., penstock), 50-ft offsets from non-continuous Project features (e.g., dam, powerhouse, substation), and 15-ft wide offsets from the centerline of Project access roads. North of the powerhouse, the boundary encloses the Pacific Park Campground which is bounded by the southeast channel of the West Fork Wallowa River, the PacifiCorp property line, and the boundary of a lease to Oregon Parks

and Recreation Department. Northwest of the powerhouse the boundary has been expanded to include 0.4 acres of private property to accommodate the new tailrace configuration and outfall structure. At the south end of the Project, the boundary includes a 50-ft buffer area around the Project facilities including the Royal Purple diversion dam, Wallowa Falls dam, forebay, laydown/storage area, and penstock. The revised boundary along the penstock includes a 50-ft wide corridor on each side of the penstock but occasionally follows the outer edge of the access road in locations where the access road diverges from the penstock. The access road generally remains close to the penstock alignment except at the diversion dam and also at the north end of the Project where it is located on PacifiCorp property.

The revised Project boundary includes approximately 26.4 acres of land. Approximately 12.7 acres of federal land is within the revised boundary. This represents a 0.6-acre increase of federal lands within the proposed boundary compared to the 12.1 acres of federal lands in the current boundary. None of the federal land within the revised Project boundary is occupied by Project transmission lines.

Federal Lands in the Project Boundary				
PLSS Township and Range, W.M.	PLSS Section	Quarter-Quarter Section	Acres	Agency Jurisdiction
T3S, R45E	32	NE,NE	1.4	USDA-FS
T3S, R45E	33	NW,NW	2.6	USDA-FS
T3S, R45E	33	SW,NW	3.5	USDA-FS
T3S, R45E	33	NW,SW	4.6	USDA-FS
T3S, R45E	33	NE,SW	0.5	USDA-FS
T3S, R45E	33	SE,SW	0.1	USDA-FS
		Total Acres	**12.70**	