



MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO: Commissioners Carlson, Barofsky, McRae, Schlossberg, and Brown

FROM: Lisa Krentz, Generation Manager; Patty Boyle, License Deployment Supervisor; and Mark Zinniker, Generation Engineering Supervisor

DATE: September 5, 2023

SUBJECT: Carmen-Smith License Deployment Program Update

OBJECTIVE: Information

Issue

On May 17, 2019, the Carmen-Smith Hydroelectric Project was issued a renewed 40-year operating license (License) by the Federal Energy Regulatory Commission (FERC). These materials provide an update on progress toward deployment of License requirements and investments to the power production facilities that will ensure a reliable supply of hydropower from the project. Also briefly discussed are challenges to deployment activities that are a result of dam safety issues. A more comprehensive discussion of EWEB's Dam Safety Program will be presented at the October Board meeting.

Background

The FERC originally issued a 50- year operating license on December 1, 1958. In anticipation of the 2008 expiration of the license, EWEB initiated Endangered Species Act consultation to evaluate the effects of the continued operation of the project in 1999. A Final License Application was submitted in November 2006, initiating a series of discussions that culminated in a supplementary Offer of Settlement Agreement among EWEB and the Settlement Parties¹ (Parties) that was filed with the FERC in October 2008.

On July 27, 2015, EWEB requested that FERC delay issuance of the new license to allow EWEB to complete an updated economic analysis of the Carmen-Smith Project. This delay gave EWEB and the Parties the opportunity to address two significant issues. EWEB's economic analysis concluded that the construction of volitional fish passage utilizing an upstream fish ladder and downstream floating fish screen was uneconomic. The revised Settlement Agreement included a trap and haul system to

1 - National Marine Fisheries Service, U.S. Fish and Wildlife Service, U.S. Department of Agriculture Forest Service, Oregon Department of Environmental Quality, Oregon Department of Fish and Wildlife, Oregon Parks and Recreation Department, Confederated Tribes of the Grand Ronde Community of Oregon, Confederated Tribes of the Siletz Indians of Oregon, Confederated Tribes of the Warm Springs Reservation of Oregon, McKenzie Flyfishers, Rocky Mountain Elk Foundation, Trout Unlimited

enable upstream fish passage and modifications to the existing Trail Bridge Spillway and gate to provide downstream fish passage, including permanently shutting down the Trail Bridge Powerhouse for the purposes of generating power to serve load. A three-year deadline was established for these projects. Also, to address a jurisdictional issue at the Federal level, the Parties agreed that certain planned improvements located within the designated area of the McKenzie Wild and Scenic River would be subject to authorization of the USDA Forest Service. In November 2016 EWEB filed an Amended and Restated Settlement Agreement and, after this lengthy process, the current 40-year License was issued.

Combined, the License and Settlement Agreement establish EWEB’s obligations, which are primarily articulated in License Articles and six Management Plans. Requirements under each plan include ongoing management of the project as well as requirements for new or refurbished features.

Aquatics Management Plan	Establishes fish passage at Trail Bridge Dam and potentially Carmen Diversion Dam; requires aquatic habitat for all reservoirs and reaches, addresses potential stranding, mandates reservoir elevations and ramping requirements.
Recreation and Aesthetics Management Plan	Reconstruction and ongoing maintenance of recreation facilities and/or campgrounds at the three reservoirs and Ice Cap Creek Campground. Provides criteria for managing key viewsheds and informational signage.
Wildlife Management Plan	Establishes goals and requirements for the management of 343 acres of terrestrial wildlife habitat that are located primarily along the transmission line and within the Leaburg Forest; provides parameters for protection of wildlife species via seasonal restrictions for construction activities; ongoing status surveys.
Vegetation Management Plan	Closely connected to the Wildlife Management Plan; establishes requirements for native and culturally sensitive species management and wildlife habitat creation/preservation.
Cultural and Historic Properties Management	Establishes requirements for protection and enhancement of historic or cultural resources.
Roads, Waste, and Staging areas	Provides guidance for construction and maintenance activities as well as road maintenance and storage areas.

In addition to the Management Plans listed above, the license also required EWEB to develop plans to guide ongoing activities including a Fire Response Plan, Water Quality Management Plan, and Transmission Line Management Plan.

In total, the License and Settlement Agreement include hundreds of requirements, ranging from relatively small projects and monitoring efforts to large, multi-year, complex construction projects.

Concurrent with implementing the requirements of the Amended Settlement Agreement, generation engineering staff continued with efforts to refurbish the power plants and ancillary systems to replace end of life equipment and ensure reliable power production. Projects included rebuilding the existing Carmen gantry crane and replacing the Carmen turbine shut off valves.

Several environmental improvements were implemented prior to license issuance as interim measures considering the eight-year span between the initial Settlement Agreement submittal in 2008 and the Amended Settlement Agreement filing in 2016. Examples included initiating downstream flows in the Upper Carmen Bypass Reach and providing funding for a part-time Forest Protection Officer.

Discussion

License Deployment

It has been a busy and challenging four years since the License was issued. In preparation for License deployment, staff established a multidisciplinary team of biologists, engineers, and regulatory specialists who subsequently put in place contracts to design and construct License required projects. Staff from multiple areas of the utility have completed many important projects, including the following:

1. Reconstruction of Trail Bridge and Ice Cap Creek Campgrounds.
2. Relocation of several spans of the Carmen Transmission Line out of the sensitive riparian areas of Deer Creek, and installation of bird flight diverters on the overwater transmission line crossings.
3. Rebuilding the Carmen Substation, including the switchgear, and replacing the control system in the Trail Bridge Power Plant. Rebuilding of the first of two turbine generator units at the Carmen Power Plant is expected to be completed later this year.
4. Supplementary management plans have been written, approved and are being deployed (Transmission Line Management Plan, Water Quality Management Plan, and Terrestrial Habitat Management Plan).
5. Expansion and reconstruction of the Spawning Channel, including a temporary fish trap and haul facility and relocation of the power supply to the spawning channel.
6. Initiating major design efforts, such as upstream and downstream fish passage, flow release facilities at Carmen Diversion, expanded spillway and flow release system at Smith Dam, and design and initial site preparation for a new load bank near the project campus.

Upcoming construction projects planned for 2024 include terrestrial habitat improvements along the Carmen Transmission Line, additional housing and storage facilities at the campus, and aquatic habitat throughout the project. Additionally, the existing debris boom on Trail Bridge Reservoir will be replaced, recreation areas at Smith Reservoir will be rebuilt, and refurbishment of the second turbine generator at the Carmen powerhouse will begin. Contracts supporting these projects have either already been approved or request for approval will be submitted to the Board in the upcoming months. The attached Carmen Smith Master Plan Summary is updated annually and submitted to the FERC in order to keep them apprised of upcoming projects and timelines. We have done our best to be realistic regarding the timing and sequencing of upcoming projects, although emergent issues regarding dam safety, regulatory review delays, wildfires or contractor delays will continue to periodically impact scheduling.

Trail Bridge Reservoir Sinkholes

While we have made noteworthy progress in License deployment efforts, there are significant dam safety and regulatory challenges to navigate over the next several years. In May of 2021, review of

recently collected bathymetric survey data from Trail Bridge Reservoir revealed advancement of two sinkholes in the reservoir. The sinkholes were observed by comparing bathymetric survey data from 2021 to previous data collected in 2010. In response to the observation, EWEB filed an incident report with FERC and took immediate actions to investigate the nature of the sinkholes. Action included review of dam construction and subsurface data, completion of detailed site inspections and observations, a Remotely Operated Vehicle inspection, and an engineering dive inspection. Investigation results indicated potential internal erosion, necessitating additional action to mitigate public safety risk. In coordination with FERC Dam Safety, staff developed and implemented risk reduction measures, such as lowering the water surface elevation of Trail Bridge Reservoir, installing piezometers at Trail Bridge Dam to monitor pressure and flow, and increasing monitoring and inspection of the Dam and nearby areas. A Sinkhole Investigation Plan was drafted and is in process. Fortunately, repeat bathymetric studies in 2022 and 2023 indicate little change in sinkhole size.

Given the proximity of the sinkholes to planned fish passage facilities, FERC Dam Safety has indicated that until the sinkhole investigation is complete and a remediation plan is prepared and approved, they are unable to review or authorize construction of the permanent upstream and downstream fish passage projects required by the license. FERC Dam Safety also required EWEB to form a Board of Consultants (BOC) to participate in the design review of projects impacting dam safety. The BOC is made up of industry experts in dam safety who review and provide feedback to EWEB and FERC on whether the designs prepared for any project or evaluation have adequately addressed all dam safety issues.

Mitigation for Delayed Fish Passage

Because the relicensing process experienced significant delays, both EWEB and regulatory agencies were motivated to install fish passage as soon as possible. Shortly after the License was issued, it became clear that, in an attempt to be responsive to that urgency, we had been overly optimistic in establishing a 3-year deadline for installation. Delays to fish passage are both frustrating and concerning to regulatory agencies and puts at risk their ability to fulfill their responsibility to administer the provisions of the Endangered Species Act and Clean Water Act.

EWEB submitted a plan, schedule, and 30% design for the fish passage projects to FERC in May 2020 that indicated completion of these projects beyond the License-required date of May 2022. In response, in July 2020 the National Marine Fisheries Service, U.S. Fish & Wildlife Service, Oregon Department of Environmental Quality, and Oregon Department of Fish & Wildlife initiated Dispute Resolution with EWEB under the terms of the Settlement Agreement. In October 2020, FERC directed EWEB to continue working with the disputing parties towards resolution, and to develop an acceptable combined plan and schedule for completing the upstream and downstream fish passage facilities.

EWEB has been actively working with the disputing parties to develop an appropriate mitigation agreement to account for impacts related to delays in permanent fish passage at Trail Bridge Dam. Although a full agreement is not yet finalized, mitigation actions completed to date include funding the final phase of the Deer Creek Stage 0 Aquatic Restoration Project and the design and construction of a temporary trap and haul facility at the spawning channel. Additional actions under discussion are options to increase interim downstream passage, enhanced habitat and flows in the Smith Bypass

Reach, and providing funding for habitat projects identified in the future. We are currently working to complete design of the habitat features in the Smith Bypass Reach, including associated instream flow. Resolution of this aspect should enable us to complete a mitigation package for future Board review and approval.

Operational Impacts

When complete, the Carmen Smith License Deployment effort will result in a reliable hydroelectric project with many enhancements to the environmental and recreation features of the project. Ultimately, permanent fish passage will allow for year-round upstream and downstream migration and access to significantly expanded spawning and rearing habitat. Campgrounds will have been modernized, including greater accessibility and more educational features. However, implementing the projects required to achieve these goals has both short and long-term impacts on facility operations that can be challenging to address. For example, on-site weather and wildfire conditions create incredibly short construction seasons, and multiple complex projects occurring near each other creates significant logistical challenges. In addition, operations staff have limited capacity to both focus on ongoing safe operation of the project and participate in the planning and construction for projects. Although additional staffing is planned, the plant is remote and requires specialized skills that are not always easy to find in the labor market, and it will take time to train and orient new staff to the many features and systems.

Budget

Financial information for License deployment activities, including plant refurbishment, is reported quarterly in the Board Report. A project budget of \$139 million was established when the Board authorized the General Manager to enter into the Amended and Restated Settlement Agreement in 2016. Funds spent to date total \$83 million with an additional \$98 million included in the 2024-2033 Capital Improvement Plan, resulting in considerably higher than anticipated total costs for the project. There are many reasons for cost escalations, including unforeseen site conditions, challenging construction conditions (ex. weather, fire), and emergent dam safety issues necessitating redesign and/or project scope increases. Mitigation costs related to fish passage delays and remediation costs for the Trail Bridge Reservoir sinkholes are not included as they have not yet been established. Budget information will continue to be reported in the quarterly report, and staff will provide more detailed information to the Board once additional analysis is complete.

Recommendation & Requested Board Action

These materials are for informational purposes only. There is no requested Board action at this time.

Carmen-Smith Project Timelines

Project	2022				2023				2024				2025				2026				2027				2028				2029				2030				Status:									
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4														
Aquatics																																														
C-D Flow Release Structure	Design & Permitting								90	Construction		Closeout																												In Progress						
Smith Spillway and Flow Release Structure	Design & Permitting								90	Radial Gate Fab		Construction				Closeout																														In Progress
Carmen Powerhouse Load Bank	Design & Permitting				90	Construction				Closeout																												In Progress								
TB Upstream fish Passage (Trap & Haul)	Design & Permitting								100	Construction				Closeout																														In Progress		
TB Downstream Fish Passage	Design & Permitting								100	Radial Gate Fabrication				Construction				Closeout																												In Progress
Temporary Trap & Haul	Design & Permitting				Construction		Closeout																												In Progress											
Tailrace Barrier Removal																					Design and Permitting		90	Construction		Closeout												Not Started								
Spawning Channel Exit Improvement																					Design and Permitting		90	Construction		Closeout												Not Started								
Habitat																																														
C_D Reservoir Habitat	Design & Permitting								90	Construction		Closeout																												In Progress						
Smith Reservoir Habitat	Design & Permitting				90	Construction		Closeout																												In Progress										
Trail Bridge Reservoir Habitat	Design & Permitting				90	Construction		Closeout																												In Progress										
Upper Carmen Bypass Reach Habitat																					Gravel Survey												Not Started													
Lower Carmen Bypass Reach Habitat	Design & Permitting								90	Construction		Closeout																												In Progress						
Smith Bypass Reach Habitat	Design and Permitting								90	Construction		Closeout																												In Progress						
Spawning Channel Habitat	90	Design & Permitting				Construction		Closeout																												In Progress										
Trail Bridge Stranding	Design, Permitting & Pre-construction Surveys								90	Construction		Closeout																												In Progress						
Recreation																																														
Carmen Diversion Recreation Improvements	Design & Permitting								Construction		Closeout																												In Progress							
Smith Recreation Improvements	Design & Permitting				Construction		Closeout																												In Progress											
Trail Bridge Recreation Improvements	Construction				Closeout																												In Progress													
Dam Safety & Capital Upgrades																																														
Carmen Diversion Sinkholes	Design and Permitting								Construction		Closeout																												In Progress							
Carmen Diversion Spillway and Underdrains	Design and Permitting								Construction		Closeout																												In Progress							
Carmen Diversion Tree Removal and Blanket Repair	Design & Permitting				Construction		Closeout																												In Progress											
Diversion Tunnel Bulkhead Replacement													Design & Permitting				Construction		Closeout																Not Started											
Carmen Powerhouse Upgrades	Construction				Closeout																												In Progress													
Trail Bridge Reservoir Sinkholes	Design and Permitting								Construction		Closeout																												In Progress							
TB Penstock and Intake Gate Upgrade													Design & Permitting				Construction		Closeout																Not Started											
Trail Bridge Powerhouse Electrical and Control Upgrades	Design	Construction	Closeout																												In Progress															
Trail Bridge Debris Boom and Operations Boat Ramp	Design & Permitting								Construction		Closeout																												In Progress							
TB Tree Removal and Blanket Repair	Design and Permitting				Construction		Closeout																												In Progress											
Carmen Campus Housing	Design and Permitting				Construction		Closeout																												In Progress											

Project	2022				2023				2024				2025				2026				2027				2028				2029				2030				Status:
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
<i>Carmen Access Road Bridge Repairs</i>	Design and Permitting								Construction		Closeout																								In Progress		
<i>Culvert Upgrades</i>	Design and Permitting				Construction		Closeout																												In Progress		

Revised June, 2023



Fish Working Group 90% Plan Development Consultation

* EWEB will provide updates at 30%, 60%, 90% and 100%

Bold Italics = Projects that are progressing and likely to go to construction by 2024