

168 FERC ¶ 62,071
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Great River Hydro, LLC

Project No. 2323-226

ORDER AMENDING LICENSE
AND APPROVING REVISED EXHIBIT A

(Issued August 6, 2019)

1. On January 4, 2019 and supplemented February 22, and April 17, 2019, Great River Hydro, LLC., licensee for the Deerfield River Hydroelectric Project No. 2323,¹ filed an application to amend its license in order to install a new turbine-generator unit in an existing minimum flow structure located at the Deerfield No. 5 development. The project consists of eight developments and is located on the Deerfield River in Berkshire and Franklin counties Massachusetts, and Bennington and Windham counties, Vermont. The project does not occupy federal land.

Background

2. As amended,² the Deerfield No. 5 development consists of: (1) the Deerfield No. 5 dam comprised of; (a) a 35-foot-tall, 90-foot-long concrete gravity spillway with eight foot high hydraulic crest gates, and (b) a concrete intake structure housing two, 8-foot-wide, 7.75-foot-high sluice gates and a single 12.5-foot by 13-foot intake gate, and a 60-inch-diameter pipe feeding a minimum flow conduit releasing water into the bypassed reach; (2) a 12-foot-high, 160-foot-long diversion structure on Dunbar Brook; (3) a 14,941-foot-long conveyance system; (4) a 10-foot-diameter, 400-foot-long steel penstock; (5) an impoundment with a surface area of 38 acres, a storage capacity of 118 acre-feet, and a normal maximum water elevation of 1,027.66 feet mean sea level; (6) a powerhouse containing one vertical Francis turbine-generator unit with a capacity of 15,516 kilowatts (kW); (7) a switchyard and; (8) appurtenant facilities.

3. License Article 405 requires the licensee to release a minimum flow of 73 cubic feet per second (cfs), or inflow, whichever is less, into the bypassed reach at the Deerfield No. 5 development. Furthermore, the article requires the licensee release no less than 57 cfs at any time. The licensee fulfills this requirement through use of a calibrated orifice plate with an approximately 2-foot-diameter hole which is sufficient to release

¹ *New England Power Company*, 79 FERC ¶ 61,006 (1997), *Order on Reh'g*, 82 FERC ¶ 61,177 (1998).

² *USGen New England, Inc.*, 102 FERC ¶ 62,125 (2003).

between 74 and 87 cfs depending on reservoir and tailwater elevations. The plate is located within the minimum flow conduit the licensee constructed to the right of the spillway when the dam was rebuilt in 1992.

Amendment Application

4. In its January 4, 2019 amendment application, the licensee states the minimum flow conduit was constructed with the intent of housing a Flygt brand turbine-generator unit, with the orifice plate having been installed to regulate minimum flow in the interim. The licensee states it now intends to install such a turbine in the structure. The turbine would have a rated capacity of 230 kW, a hydraulic capacity ranging from 76.5 to 88 cfs, depending upon net head conditions, and would produce approximately 1,269,385 kilowatt-hours each year. Additional proposed facilities the licensee states that would be placed on or adjacent to the existing flow conduit include a small overhead crane, a riser pole, a transformer, and an electric meter.

5. The licensee states that during construction, it would satisfy the minimum flow requirement through releases from the flap or sluice gates at the development. The licensee also states it intends to begin installing the unit in August of 2019, and commission it by October 31, 2019.

6. In the application, the licensee states that installation and use of the new turbine to deliver the minimum flow would not result in any changes to project operation. Furthermore, the licensee indicates that if the unit were to trip offline, it would allow approximately 160 cfs to pass in a no-load condition. When returning the proposed turbine-generator to operation, the licensee states it would use the gates at the project to ensure compliance with the minimum flow requirement.

Pre-Filing Consultation

7. In January 2018, the licensee contacted the U.S. Fish and Wildlife Service (FWS), the Massachusetts Department of Environmental Protection (Massachusetts DEP), and the Massachusetts Division of Fish and Wildlife (Massachusetts DFW) regarding its proposal and to discuss any concerns the agencies might have. Subsequently, to discuss these issues, the licensee and agencies held several meetings in which the proposal was discussed and additional information provided by the licensee. Through these meetings, the FWS concluded that entrainment would not be a significant issue as a result of the proposed action, the Massachusetts DEP stated a new or revised Water Quality Certificate would not be required due to the new turbine, and the Massachusetts DFW concluded it had no concerns with respect to fishery resources.

8. Following the licensee's January 4, 2019 amendment application filing, Commission staff required the licensee to hold a joint meeting with an opportunity for a

site visit, as required under the Commission's three-stage consultation process.³ Consequently, the licensee issued public notice of the meeting, which occurred on March 12, 2019. As described in the April 17, 2019 filing, the licensee states a representative of the Connecticut River Conservancy (Conservancy) attended the site visit and joint meeting. In its February 22, 2019 filing, the licensee provided written statements from the FWS and Massachusetts DFW waiving further consultation. Additionally, in the April 17, 2019 filing, the licensee included written statements from the Massachusetts DEP and the Conservancy indicating that they would waive the requirement to continue consultation.

Public Notice

9. On April 25, 2019 the Commission issued public notice that the amendment application was accepted for filing and soliciting comments, protests, and motions to intervene. The Massachusetts DFW filed comments on May 28, 2019, stating it had determined the licensee's proposal would not result in significant environmental impacts and therefore, it does not oppose the amendment request. The FWS filed comments on June 3, 2019, explaining that during the pre-filing consultation process, its primary concern was entrainment of resident fish populations into the proposed turbine. However, in its comments, FWS explained that the entrainment concerns had since been addressed.

Threatened and Endangered Species

10. Section 7(a)(2) of the Endangered Species Act of 1973⁴ requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of critical habitat. The threatened northern long-eared bat, and the endangered drawf wedgemussel and northeastern bulrush may be found near the project area. Under its proposal, the licensee would not be conducting any work in the water or vegetated areas. Furthermore, the licensee's actions would not entail removal of trees that may serve as bat habitat. As such, we determine that the proposed action would have no effect on federally listed threatened or endangered species.

Environmental Review

11. We used the environmental information and consultation provided by the licensee as well as information from the prior licensing proceeding in conducting our review of the proposal. Because the licensee's proposed changes would not affect soils, water

³ 18 C.F.R. 4.38 (2018).

⁴ 16 U.S.C. § 1536(a) (2012).

quality, wildlife, or vegetated areas, the proposal would have no impact on these resources. Furthermore, as discussed above, the changes to the project would not affect federally listed threatened or endangered species. Subsequently, we will not review the impact of the licensee's modifications on these resource areas. Therefore, we will analyze the impacts of the licensee's proposed action on water quantity and fisheries.

A. Water Quantity

12. The Deerfield No. 5 drains an area of 90 square miles while the impoundment has a surface area of approximately 8.2 acres and a shallow depth ranging from 5 to 10 feet. The impoundment is riverine with a length of approximately 2,400 feet and a width of 100 to 175 feet with sparse aquatic vegetation and a sand to boulder substrate. Below the dam, flows in the 2.6-mile-long bypassed reach consist of leakage from the dam, local inflow, and the minimum flow required by license Article 405. As described above, the licensee is required to release 73 cfs or inflow, but no less than 57 cfs. This minimum flow is drawn from the intake area behind the trashracks, passes through the orifice plate in the minimum flow conduit, and is discharged below the right side of the spillway. The plate is sized to release a flow between 74 and 87 cfs under normal head and tailwater elevations.

13. During installation of the proposed turbine, the licensee would release the minimum flow using either the sluice gates, located just upstream of the minimum flow conduit, or the flap gates located on the crest of the dam. In that way, the location of the minimum flow release would change during the construction period, but it would be a minor difference. Once the new turbine is operational, there would be no change in the location of where the minimum flow is drawn from within the intake structure or where it is released, as compared to existing conditions. Additionally, though the hydraulic range of the turbine is slightly higher than the range of the existing orifice plate, it is so similar that the differences in releases between the two would be negligible. However, when restarting the unit, the licensee would release flow from the gates at the project, altering the location of the flows, though this is likely similar to events in which the licensee would perform maintenance on the minimum flow conduit in the past.

14. Because the minimum flow conduit has already been designed for the turbine-generator unit, and because the proposal essentially entails a "drop-in" installation, there would be little change to water quantity. However, there would still be some minor changes, primarily during construction, though these changes in flow release locations could be observed only at the dam and once flow passes the existing minimum flow release location, conditions would be identical to existing circumstances.

B. Fisheries

15. Fishery species within the Deerfield No. 5 reservoir include rainbow trout, smallmouth bass, rock bass, pumpkinseed, and white sucker. The majority of these fishes

have established breeding populations within the impoundment; however, rainbow trout fybd in the impoundment are likely migrants from upstream stocking efforts. Fish species present in the bypassed reach below the dam are similar to those residing in the impoundment.

16. In consultation with the FWS, the licensee conducted a review of water velocities past the trashracks and into the minimum flow conduit, both at the maximum hydraulic capacity of the development and with only the minimum flow being released. The results of the study indicate the potential for entrainment, under any flow scenario, is very low. However, if fish are entrained, rather than passing through an approximately 2 foot-diameter opening in a static orifice plate, they would instead travel through a small, four-bladed turbine operating at a speed of 605 revolutions per minute.

17. We conclude that the very similar flows into the minimum flow conduit under existing and proposed operation would result in a negligible impact on the probability of entrainment, which is already very low, though any fish that are entrained would very likely suffer injury or mortality due to the small size and very high speed of the turbine. Therefore, the proposal would have an adverse, though very minor impact on fishery resources.

C. Conclusion

18. Based on information provided by the licensee and staff's independent analysis, we find that authorizing the licensee's proposed action to install a minimum flow turbine at the Deerfield No. 5 development of the Deerfield River Hydroelectric Project would not constitute a major federal action significantly affecting the quality of the human environment.

Administrative Provisions

A. Annual Charges

19. The Commission levies annual charges against licensees for its administration of their licenses under Part I of the Federal Power Act. These charges are based partially on the authorized installed capacity of a project and would be effective upon the commencement of construction of the new capacity.⁵ Because the license would be installing a new turbine and raising the installed capacity of the project, we will require it to notify us of when it begins installation of the new unit so that we may revise the annual charges at that time.

⁵ 18 C.F.R. 11.1 (2018).

B. Project Description

20. The licensee's February 22, 2019 filing included an Exhibit A for the project describing the new proposed unit. We have reviewed this exhibit and determine that it conforms to the Commission's regulations and should be approved.

C. Review of Plans and Specifications

21. To ensure the licensee is constructing and operating a safe and adequate project, prior to the start of construction, ordering paragraph (E) requires the licensee to provide the Commission's Division of Dam Safety and Inspections (D2SI) – New York Regional Engineer, for review and approval, contract plans and specifications. Additionally, ordering paragraph (F) requires the licensee to provide the Commission's D2SI- New York Regional Engineer with cofferdam and deep excavation construction drawings.

22. The licensee may not begin any construction until the Commission's D2SI – New York Regional Engineer has reviewed and commented on the plans and specifications, determined that all preconstruction requirements have been satisfied, and authorized, in writing, the start of construction.

23. Following completion of construction, the licensee must file, for Commission approval, revised as-built Exhibits A and F that include any changes made during construction that differ from the designs authorized by this amendment. Ordering paragraph (G) of this order requires the filing of these exhibits.

The Director orders:

(A) The license for the Deerfield River Hydroelectric Project No. 2323 is amended as provided by this order, effective the day this order is issued.

(B) Ordering paragraph (B)(2) of the license is revised, in part, to read as follows:

(2) the Deerfield project consists of eight developments as follows:

Somerset consists of: (1) an earthfill dam structure about 110 feet high and 2,101 feet long with a crest elevation of 2,133.58 feet mean sea level (msl); (2) main outlet works located at the eastern end of the dam which consist of two gated, 48-inch-diameter pipes that are used to control reservoir discharge; (3) a side channel spillway, about 800 feet long, 45 feet wide, and from 6 to 30 feet deep, located at the western end of the dam with a crest elevation of 2,133.58 feet msl; (4) an impoundment, about 5.6 miles long, with a gross surface area of about 1,514 acres, a gross storage capacity of 57,345 acre-feet (ac-ft), a usable storage capacity of 20,614 ac-ft, and a normal pool headwater elevation range of 2,113.10 to 2,128.10 feet msl.

Searsburg consists of: (1) an earthfill dam structure about 50 feet high and 475 feet long with a 137-foot-long concrete gravity spillway, with a crest elevation of 1,749.66 feet msl, topped with 5-foot-high flashboards from May 1 to October 31; (2) an intake and penstock with (a) a wood stave conduit 8 feet in diameter and 18,412 feet long, (b) a steel differential surge tank 50 feet in diameter and 34 feet high, and (c) a steel penstock 6.5 feet in diameter and 495 feet long; (3) a powerhouse containing one vertical Francis turbine unit with a capacity of 4,000 kilowatts (kW); (4) an impoundment, about 0.9 miles long, with a surface area of about 30 acres, a gross storage capacity of 412 ac-ft, a usable storage capacity range of 67 to 197 ac-ft, and a normal pool elevation range of 1,746.66 to 1,754.66 feet msl; and (5) appurtenant facilities.

Harriman consists of: (1) an earthfill dam 215.5 feet high and 1,250 feet long; (2) a storage reservoir, 9 miles long, having a surface area of about 2,039 acres, a gross storage capacity of 117,300 ac-ft, a usable storage capacity of 103,375 ac-ft (from elevation 1,405.66 to 1,491.66 feet msl), and a normal pool headwater elevation of 1,449.70 to 1,491.66 feet msl; (3) a morning glory spillway, with 16 gates, at a sill elevation of 1,491.66 feet msl, topped with 6-foot-high flashboards; (4) two 8-foot-diameter valves, a 12,812-foot-long, 14-foot-diameter concrete lined horseshoe shaped intake tunnel, a steel differential surge tank 34 feet in diameter and 184 feet high, and three steel penstocks 9 feet in diameter and 620 feet long; (5) a powerhouse containing three vertical Francis turbine units with a total hydraulic capacity of 1,600 cubic feet per second (cfs), and an installed capacity of 11,200 kW each; and (6) appurtenant facilities.

Sherman consists of: (1) a 110-foot-high, 810-foot-long earthfill dam, with a crest elevation of 1,129.66 feet msl; (2) a 179-foot-long concrete gravity spillway, with a crest elevation of 1,103.66 feet msl, topped with 4-foot-high flashboards which operate year-round; (3) a concrete and brick intake structure and penstock which conveys water to the powerhouse via a concrete conduit 98 feet in length with a cross-sectional area of 142 square feet, and a steel penstock 13 feet in diameter and 227 feet long; (4) an impoundment, about 2 miles long, with surface area of about 218 acres, gross storage capacity of 3,593 ac-ft, useable storage capacity of 1,359 ac-ft, and a normal pool headwater elevation range of 1,104.66 to 1,107.66 feet msl; (5) a powerhouse containing one vertical Francis turbine unit with a capacity of 7,200 kW; and (6) appurtenant facilities.

Deerfield No. 5 consists of: (1) the Deerfield No. 5 dam, comprised of a concrete gravity spillway about 35 feet high and 90 feet long, with a top elevation of 1,109.66 feet msl, topped with 8-foot-high hydraulic steel flap gates which maintain a normal reservoir elevation of 1,027.66 feet msl, a concrete intake structure, consisting of two 8-foot-wide by 7.75-foot-high sluice gates, with a sill elevation of 1,002.28 feet msl, and a single 12.5-foot by 13-foot intake gate with a sill elevation of 1,008.16 feet msl; (2) a 60-inch-diameter pipe connected to the intake structure feeding a turbine-generator unit with an installed capacity of 230 kW and a maximum hydraulic capacity of 88 cfs releasing water

into the bypassed reach; (3) a small concrete gravity diversion structure on Dunbar Brook approximately 12 feet high and 160 feet long; (4) conveyance sections of tunnel, concrete conduit, and canal totaling 14,941 feet; (5) a steel penstock 10 feet in diameter and 400 feet long; (6) an impoundment about 0.75 miles long, having a surface area of about 38 acres, a storage capacity of 118 ac-ft, and a normal pool headwater elevation range of 1,022.66 to 1,027.66 feet msl; (7) a powerhouse containing one vertical Francis turbine unit with a capacity of 15,516 kW and a hydraulic capacity of 1,250 cfs; (8) a switchyard located on River Road across from the Bear Swamp Visitor's Center; and (9) appurtenant facilities.

Deerfield No. 4 consists of: (1) an earthfill dam (with a concrete core) about 50 feet high and 160 feet long; (2) a 241-foot-long concrete gravity spillway with a crest elevation of 465.66 feet msl, topped with wooden flashboards ranging in height seasonally from 4 to 8 feet; (3) three sluice gates located in the east abutment, two with a sill elevation of 462.66 feet msl and another with a sill elevation of 464.66 feet msl; (4) an impoundment about 2 miles long, having a surface area of about 75 acres, a gross storage capacity of 467 ac-ft, and a usable storage capacity of 432 ac-ft, and a normal pool headwater elevation range of 465.66 to 473.66 feet msl; (5) a power tunnel which conveys water from the intake structure at the impoundment via a 12.5-foot-diameter, 1,514-foot-long concrete and brick-lined horseshoe shaped tunnel that leads to the powerhouse forebay; (6) a powerhouse containing three horizontal Francis turbine units with a capacity of 1,600 kW each, and a combined hydraulic capacity of 1,470 cfs; and (7) appurtenant facilities.

Deerfield No. 3 consists of: (1) a concrete gravity spillway about 15 feet high and 475 feet long with a crest elevation of 396.66 feet msl, topped with 6-foot-high wooden flashboards; (2) two sluice gates; (3) a power tunnel 677 feet long, 17 feet wide, and 12.5 feet high; (4) an impoundment about 1.3 miles long, having a surface area of about 42 acres, a gross storage capacity of 221 ac-ft, a usable storage capacity of 200 ac-ft and a normal pool headwater elevation range of 396.66 to 402.66 feet msl; (5) a powerhouse containing three horizontal Francis turbine units with a capacity of 1,600 kW each and a hydraulic capacity of 149.0 cfs; (6) a switchyard located within the powerhouse; and (7) appurtenant facilities.

Deerfield No. 2 consists of: (1) a concrete gravity spillway about 15 feet high and 277 feet long, with a top elevation of 284.66 feet msl consisting of a 112-foot-long inflatable flashboard section, an approximately 146-foot-long section with two-stage 10.5 foot-high wooden flashboards, and four sluice gates; (2) an impoundment about 1.5 miles long, with a surface area of about 63.5 acres, a gross storage capacity of 350 ac-ft, a usable storage capacity of 300 ac-ft, and a normal pool headwater elevation range of 284.66 to 290.66 feet msl; (3) a powerhouse located adjacent to the Deerfield No. 2 dam, containing three horizontal Francis turbine units with a capacity of 1,600 kW each and a

hydraulic capacity of 1,450 cfs; (4) a switchyard located within the powerhouse; and (5) appurtenant facilities.

(C) Within 15 days of the date of commencing construction of the facilities authorized in this order, the licensee must file a letter with the Secretary of the Commission identifying that date. This date will be used to modify the authorized installed capacity of the project under license Article 201.

(D) The Exhibit A filed by Great River Hydro, LLC for the Deerfield River Hydroelectric Project No. 2323 on February 22, 2019, is approved superseding the previous Exhibit A.

(E) At least 60 days prior to the start of any construction, the licensee must submit one copy of its final plans and specifications and supporting design document to the Commission's Division of Dam Safety and Inspections (D2SI)-New York Regional Engineer, and two copies to the Commission (one of these must be a courtesy copy to the Director, D2SI). The submittal to the D2SI-New York Regional Engineer must also include as part of preconstruction requirements: a Quality Control and Inspection Program, Temporary Construction Emergency Action Plan, and Soil Erosion and Sediment Control Plan. The licensee may not begin construction until the D2SI- New York Regional Engineer has reviewed and commented on the plans and specifications, determined that all preconstruction requirements have been satisfied, and authorized start of construction.

(F) Should construction require cofferdams or deep excavations, the licensee must: (1) have a Professional Engineer who is independent from the construction contractor, review and approve the design of contractor-designed cofferdams and deep excavations prior to the start of construction; and (2) ensure that construction of cofferdams and deep excavations is consistent with the approved design. At least 30 days before starting construction of any cofferdam or deep excavation, the licensee must submit one copy to the Commission's Division of Dam Safety and Inspection's New York Regional Engineer and two copies to the Commission (one of these shall be a courtesy copy to the Director, D2SI), of the approved cofferdam and deep excavation construction drawings and specifications, and the letters of approval.

(G) Within 90 days of completion of construction of the facilities authorized by this amendment, the licensee must file for Commission approval, as-built Exhibits A and F.

(H) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the Federal Power Act, 16 U.S.C. § 8251 (2012), and the Commission's regulations at 18 C.F.R. § 385.713 (2018). The filing of a request for rehearing does not operate as a stay of the effective date of this order, or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

Kelly Houff
Chief, Engineering Resources Branch
Division of Hydropower Administration
and Compliance