

**New Hampshire Department of Environmental Services
 WATER QUALITY CERTIFICATION
 In Fulfillment of
 NH RSA 485-A:12, III**

Certification Number	WQC 2021-FERC-003
Activity Name	Cocheco Falls Hydroelectric Project (FERC Project No. 4718)
Activity Location	Dover, New Hampshire (Strafford County)
Potentially Affected Surface Waters Near the Activity (other affected surface waters may exist)	Cocheco River: Riverine section upstream of impoundment (NHRIV600030608-05) Project impoundment (NHIMP600030608-04) Estuary downstream of Project Dam (NHEST600030608-01) Unnamed wetlands
Owner/Applicant	Cocheco Falls Associates L.P.
Agent Filing Application on Behalf of Owner/Applicant	John N. Webster, Managing Partner Cocheco Falls Associates L.P. P.O Box 178 South Berwick, ME 03908
Applicable Federal License or Permit Requiring Section 401 Water Quality Certification	Federal Energy Regulatory Commission - Subsequent License for Minor Water Power Project
Decision	Granted with Conditions
Date of Issuance	October 11, 2022

A. INTRODUCTION

Cocheco Falls Associates L.P. (the Applicant) has applied for a license from the Federal Energy Regulatory Commission (FERC) to continue the operation and maintenance of the Cocheco Falls Hydroelectric Project (Project or Activity) located on the Cocheco River in the City of Dover, Strafford County, New Hampshire. The Project has a total installed generating capacity of 0.714 megawatts (MW) and the Applicant proposes to continue operating the Project as run-of-river. A more complete description of the Project is provided in Findings D-3 through D-6 of this certification.

In accordance with the Section 401 of the federal Clean Water Act (CWA) and New Hampshire law under NH RSA 485-A:12, III, the Applicant has applied for a water quality certification (WQC or certification) from the New Hampshire Department of Environmental Services (NHDES) for a FERC license. The purpose of the certification is to provide assurance that discharges from the proposed Project will comply with New Hampshire surface water quality standards that are specified under NH RSA 485-A:8 and NH Code of Administrative Rules Env-Wq 1700 (Surface Water Quality Standards). Additional details are provided herein.

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Documents cited in this certification that were filed with FERC, can be accessed on the [FERC elibrary](#) by date or FERC Document Accession Number.

B. DECISION

Based on the facts, laws, findings and conditions included herein, NHDES has determined that there is reasonable assurance that discharges from construction and operation of the proposed Project will comply with New Hampshire Surface Water Quality Standards.¹ NHDES hereby grants this certification in accordance with RSA 485-A:12, III, subject to the conditions in Section E of this certification.

C. FACTS AND LAWS

Federal Certification Laws and Regulations

- C-1. Section 401(a)(1) of the CWA states in part: “Any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate [...] that any such discharge will comply with the applicable provisions of sections 301, 302, 303, 306, and 307 of this title. [...] No license or permit shall be granted until the certification required by this section has been obtained or has been waived [...] No license or permit shall be granted if certification has been denied by the State [...].”
- C-2. Section 401(d) of the CWA states in part: “Any certification provided under this section [401] shall set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure that any applicant for a Federal license or permit will comply with [enumerated provisions of the CWA] and with any other appropriate requirement of State law set forth in such certification, and shall become a condition on any Federal license or permit subject to the provisions of this section.”
- C-3. Federal regulations regarding Section 401 water quality certification may be found in the Code of Federal Regulations (CFR), Title 40, PART 121 (40 CFR 121) titled “State Certification of Activities Requiring a Federal License or Permit”. On July 13, 2020, the U.S. Environmental Protection Agency

¹ Federal CWA Section 401 regulations (40 CFR § 121.7(c)), which is applicable to water quality certification requests submitted on or after September 11, 2020, requires States to include a statement in the certification that the discharge from the proposed project “will comply” with water quality requirements as defined in 40 CFR § 121.1(n). See Fact C-3.

(EPA) published final revisions to these regulations in the Federal Register (Vol. 85, No. 134, pages 42210 to 42287), which became effective on September 11, 2020.

- C-4. 40 CFR § 121.1(f) defines “discharge” as “a discharge from a point source into a water of the United States.”²
- C-5. The term “discharge,” as applied under section 401 of the CWA means the potential for a discharge. It does not need to be a certainty, only that it may occur should the federal license or permit be granted. Further, the discharge does not need to involve the addition of pollutants (such as water released from the tailrace of a dam). As the U.S. Supreme Court has stated: “When it applies to water, ‘discharge’ commonly means a ‘flowing or issuing out’” and an addition of a pollutant is not “fundamental to any discharge.”
- C-6. The CWA Section 502(7) (33 U.S.C. §1362(7)) defines “navigable waters,” as “waters of the United States”.
- C-7. Waters of the United States are defined in 40 CFR §122.2.

State Certification Law

- C-8. NH RSA 485-A:12 III, states: “No activity, including construction and operation of facilities, that requires certification under section 401 of the Clean Water Act and that may result in a discharge, as that term is applied under section 401 of the Clean Water Act, to surface waters of the state may commence unless the department certifies that any such discharge complies with the state surface water quality standards applicable to the classification for the receiving surface water body. The department shall provide its response to a request for certification to the federal agency or authority responsible for issuing the license, permit, or registration that requires the certification under section 401 of the Clean Water Act. Certification shall include any conditions on, modifications to, or monitoring of the proposed activity necessary to provide assurance that the proposed discharge complies with applicable surface water quality standards. The department may enforce compliance with any such conditions, modifications, or monitoring requirements as provided in RSA 485-A:22.”

State Surface Water Quality Standards ³

- C-9. The Surface Water Quality Standards under NH RSA 485-A:8 and Env-Wq 1700 together fulfill the requirement of section 303 of the CWA that the State of New Hampshire adopt water quality standards consistent with the provisions of the CWA. Further, RSA 485-A:8, I and II, establish two classes of surface waters in New Hampshire for the purposes of adopting Surface Water Quality Standards for each classification: Class A and Class B.
- C-10. Env-Wq 1701.01, titled “Purpose”, states: “The purpose of these rules is to establish water quality standards for the state’s surface water uses as set forth in RSA 485-A:8, I, II, III and V. These standards are intended to protect public health and welfare, enhance the quality of water and serve the purposes of the federal Clean Water Act, 33 U.S.C. 1251 et seq., and RSA 485-A. These standards provide for the protection and propagation of fish, shellfish, and wildlife, and provide for such uses as recreational

² The Supreme Court case that is referred to is *S.D. Warren Co. v. Maine Board of Environmental Protection et al*, 547 U.S. 370, 126 S. Ct. 1853 (2006).

³ All New Hampshire Surface Water Quality Standards apply to the Project. The standards specifically called out in the certification should not be interpreted as the only standards that may apply.

activities in and on the surface waters, public water supplies, agricultural and industrial uses, and navigation in accord with RSA 485-A:8, I and II.”

- C-11. Env-Wq 1701.02, titled “Applicability”, states: “These rules shall apply to:
- (a) All surface waters; and
 - (b) Any person who:
 - (1) Causes any point or nonpoint source discharge of any pollutant to surface waters;
 - (2) Undertakes hydrologic modifications, such as dam construction or water withdrawals; or
 - (3) Undertakes any other activity that affects the beneficial uses or the water quality of surface waters.”
- C-12. Env-Wq 1702.44 defines “surface waters” as “‘surface waters of the state’ as defined in NH RSA 485-A:2, XIV and waters of the United States as defined in 40 CFR 122.2.”
- NH RSA 485-A:2, XIV defines “surface waters of the state” as “perennial and seasonal streams, lakes, ponds and tidal waters within the jurisdiction of the state, including all streams, lakes, or ponds bordering on the state, marshes, water courses and other bodies of water, natural or artificial.”
- C-13. Env-Wq 1702.05 defines “benthic community” as “the community of plants and animals that live on, over, or in the substrate of the surface water.”
- C-14. Env-Wq 1702.06 defines “benthic deposit” as “any sludge, sediment, or other organic or inorganic accumulations on the bottom of the surface water.”
- C-15. Env-Wq 1702.07 defines “best management practices” as “those practices that are determined, after problem assessment and examination of all alternative practices and technological, economic and institutional considerations, to be the most effective practicable means of preventing or reducing the amount of pollution generated by point or nonpoint sources to a level compatible with water quality goals.”
- C-16. Env-Wq 1702.08 defines “biological integrity” as “the ability of an aquatic ecosystem to support and maintain a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of similar natural habitats of a region.”
- C-17. Env-Wq 1702.15 defines “cultural eutrophication” as “the human-induced addition of wastes that contain nutrients to surface waters, resulting in excessive plant growth or a decrease in dissolved oxygen, or both.”
- C-18. Env-Wq 1702.17 defines “designated uses” as “those uses specified in water quality standards for each water body or segment whether or not such uses are presently occurring. The term includes the following:
- (a) Swimming and other recreation in and on the water, meaning the surface water is suitable for swimming, wading, boating of all types, fishing, surfing, and similar activities;
 - (b) Fish consumption, meaning the surface water can support a population of fish free from toxicants and pathogens that could pose a human health risk to consumers;
 - (c) Shellfish consumption, meaning the tidal surface water can support a population of shellfish free from toxicants and pathogens that could pose a human health risk to consumers;
 - (d) Aquatic life integrity, meaning the surface water can support aquatic life, including a balanced, integrated, and adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of similar natural habitats of the region;
 - (e) Wildlife, meaning the surface water can provide habitat capable of supporting any life stage or

activity of undomesticated fauna on a regular or periodic basis; and

(f) Potential drinking water supply, meaning the surface water could be suitable for human intake and meet state and federal drinking water requirements after adequate treatment.”

- C-19. Env-Wq 1702.18 defines “discharge” as
“(a) The addition, introduction, leaking, spilling, or emitting of a pollutant to surface waters, either directly or indirectly through the groundwater, whether done intentionally, unintentionally, negligently or otherwise; or
(b) The placing of a pollutant in a location where the pollutant is likely to enter surface waters.”
- C-20. Env-Wq 1702.22 defines “existing uses” as “those uses, other than assimilation waste transport, that actually occurred in the waterbody on or after November 28, 1975, whether or not they are included in the water quality standards.”
- C-21. Env-Wq 1702.26 defines “mixing zone” as “a defined area or volume of the surface water surrounding or adjacent to a wastewater discharge where the surface water, as a result of the discharge, might not meet all applicable water quality standards.”
- C-22. Env-Wq 1702.33 defines “nuisance species” as “any species of flora or fauna living in or near the water whose noxious characteristics or presence in sufficient number or mass prevent or interfere with a designated use of those surface waters.”
- C-23. Env-Wq 1702.37 defines “point source” as “a discernible, confined, and discrete conveyance from which pollutants are or might be discharged, excluding return flows from irrigated agriculture or agricultural stormwater runoff. The term includes, but is not limited to, a pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft.”
- C-24. Env-Wq 1702.38 defines “pollutant” as “‘pollutant’ as defined in 40 CFR 122.2.” 40 CFR 122.2 defines “pollutant” as “dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 *et seq.*)), heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water. It does not mean:
(a) Sewage from vessels; or
(b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well [that is] used either to facilitate production or for disposal purposes is approved by authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.
NOTE: Radioactive materials covered by the Atomic Energy Act are those encompassed in its definition of source, byproduct, or special nuclear materials. Examples of materials not covered include radium and accelerator-produced isotopes. See *Train v. Colorado Public Interest Research Group, Inc.*, 426 U.S. 1 (1976).”
- C-25. Env-Wq, 1703.01, titled “Water Use Classifications; Designated Uses”, states:
“(a) All surface waters shall be classified as provided in RSA 485-A:8, based on the standards established therein for class A and class B waters. Each classification shall identify the most sensitive use it is intended to protect.
(b) All surface waters shall be restored to meet the water quality criteria for their designated

classification including existing and designated uses, and to maintain the chemical, physical, and biological integrity of surface waters.

(c) All surface waters shall provide, wherever attainable, for the protection and propagation of fish, shellfish and wildlife, and for recreation in and on the surface waters.

(d) Unless high or low flows are caused by naturally-occurring conditions, surface water quantity shall be maintained at levels that protect existing uses and designated uses.”

C-26. Env-Wq 1703.03, titled “General Water Quality”, states in part:

“(a) The presence of pollutants in the surface waters shall not justify further introduction of pollutants from point or nonpoint sources, alone or in any combination. [...]

(c) Unless otherwise specifically allowed by a statute, rule, order, or permit, the following physical, chemical, and biological criteria shall apply to all surface waters:

(1) All surface waters shall be free from substances in kind or quantity that:

- a. Settle to form harmful benthic deposits;
- b. Float as foam, debris, scum or other visible substances;
- c. Produce odor, color, taste or turbidity that is not naturally occurring and would render the surface water unsuitable for its designated uses;
- d. Result in the dominance of nuisance species; or
- e. Interfere with recreational activities. [...]

C-27. Env-Wq 1703.06 includes water quality criteria for bacteria.

C-28. Env-Wq 1703.07, titled “Dissolved Oxygen”, includes the following:

“(a) Class A waters shall have a dissolved oxygen content of at least 75% saturation, based on a daily average, and an instantaneous minimum of at least 6 mg/l [milligrams per liter] at any place or time except as naturally occurs.

(b) Except as naturally occurs and subject to (c) and (e), below, class B waters shall have a dissolved oxygen content of:

- (1) At least 75% of saturation, as specified in RSA 485-A:8, II, based on a daily average; and
- (2) An instantaneous minimum dissolved oxygen concentration of at least 5 mg/l.

(c) In areas identified by the New Hampshire fish and game department (NHF&G) as cold water fish spawning areas of species whose early life stages are buried in the gravel on the bed of the surface water, the 7 day mean dissolved oxygen concentration shall be at least 9.5 mg/l and the instantaneous minimum dissolved oxygen concentration shall be at least 8 mg/l for the period from October 1 of one year to May 14 of the next year, provided that the time period shall be extended to June 30 for a specific discharge to a specific waterbody if modeling done in consultation with the NHF&G determines the extended period is necessary to protect spring spawners or late hatches of fall spawners, or both.

(d) Unless naturally occurring or subject to (a), above, surface waters within the top 25 percent of depth of thermally unstratified lakes, ponds, impoundments, and reservoirs or within the epilimnion shall contain a dissolved oxygen content of at least 75 percent saturation, based on a daily average and an instantaneous minimum dissolved oxygen content of at least 5 mg/l. Unless naturally occurring, the dissolved oxygen content below those depths shall be consistent with that necessary to maintain and protect existing and designated uses.

(e) As specified in RSA 485-A:8, III, waters in a temporary partial use area established under RSA 485-A:8, II as a surface water that is receiving a combined sewer overflow discharge shall contain not less than 5 parts per million of dissolved oxygen for the duration of the discharge and up to 3 days following cessation of the discharge.”

C-29. Env-Wq 1703.08, titled “Benthic Deposits”, states:

“(a) Class A waters shall contain no benthic deposits, unless naturally occurring.

(b) Class B waters shall contain no benthic deposits that have a detrimental impact on the benthic community, unless naturally occurring.”

C-30. Env-Wq, 1703.09, 1703.10 and 1703.12 include water quality criteria for oil and grease, color and slicks, odors, and surface floating solids, respectively.

C-31. Env-Wq 1703.11, titled “Turbidity”, states:

“(a) Class A waters shall contain no turbidity, unless naturally occurring.

(b) Class B waters shall not exceed naturally occurring conditions by more than 10 NTUs.

(c) Turbidity in waters identified in RSA 485-A:8, III shall comply with the applicable long-term combined sewer overflow plan prepared in accordance with Env-Wq 1703.05(c).

(d) For purposes of state enforcement actions, if a discharge causes or contributes to an increase in turbidity of 10 NTUs or more above the turbidity of the receiving water upstream of the discharge or otherwise outside of the visible discharge, a violation of the turbidity standard shall be deemed to have occurred.”

C-32. Env-Wq 1703.13, titled “Temperature”, states:

“(a) There shall be no change in temperature in class A waters, unless naturally occurring.

(b) Temperature in class B waters shall be in accordance with RSA 485-A:8, II, and VIII.”

For class B waters, NH RSA-A:8, II states: “Any stream temperature increase associated with the discharge of treated sewage, waste or cooling water, water diversions, or releases shall not be such as to appreciably interfere with the uses assigned to this class.”

NH RSA-A:8, VIII states: “In prescribing minimum treatment provisions for thermal wastes discharged to interstate waters, the department shall adhere to the water quality requirements and recommendations of the New Hampshire fish and game department, the New England Interstate Water Pollution Control Commission, or the United States Environmental Protection Agency, whichever requirements and recommendations provide the most effective level of thermal pollution control.”

C-33. Env-Wq 1703.14, titled “Nutrients”, states:

“(a) Class A waters shall contain no phosphorous or nitrogen unless naturally occurring.

(b) Class B waters shall contain no phosphorous or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring.

(c) Existing discharges containing either phosphorous or nitrogen which encourage cultural eutrophication shall be treated to remove phosphorus or nitrogen to ensure attainment and maintenance of water quality standards.

(d) There shall be no new or increased discharge of phosphorous into lakes or ponds.

(e) There shall be no new or increased discharge(s) containing phosphorous or nitrogen to tributaries of lakes or ponds that would contribute to cultural eutrophication or growth of weeds or algae in such lakes and ponds.”

C-34. Nutrient Numeric Thresholds: New Hampshire does not currently have numeric surface water quality criteria for nutrients (total phosphorus and total nitrogen) in rule (i.e., Env-Wq 1700) but has established numeric thresholds for nutrient response parameters such as chlorophyll-a that are used for surface water quality assessments. These numeric thresholds are included in New Hampshire’s Consolidated

Assessment and Listing Methodology or CALM.⁴ The CALM states the following regarding the numeric chlorophyll-a threshold established to protect the recreation designated use: “Excessive algal growth (high biomass and high chlorophyll-a values) can impair the public safety and aesthetic enjoyment of surface waters. The General Water Quality Criteria (Env-Wq 1703.03) require that surface waters be free of substances which: produce color or turbidity making the water unsuitable for the designated use or interfere with recreational activities (Env-Wq 1703.03 (c)(1) c & e). For assessment purposes, chlorophyll-a concentrations in excess of 15 µg/L in fresh water and 20 µg/L in salt water are indicators of excessive algal growth that interferes with recreational activities.”

C-35. Env-Wq 1703.18, titled “pH”, states:

“(a) The pH of Class A waters shall be as naturally occurs.

(b) As specified in RSA 485-A:8, II, the pH of Class B waters shall be 6.5 to 8.0, unless due to natural causes.

(c) As specified in RSA 485-A:8, III, the pH of waters in temporary partial use areas shall be 6.0 to 9.0 unless due to natural causes.”

C-36. Env-Wq 1703.19, titled “Biological and Aquatic Community Integrity”, states:

“(a) All surface waters shall support and maintain a balanced, integrated and adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of similar natural habitats of a region.

(b) Differences from naturally-occurring conditions shall be limited to non-detrimental differences in community structure and function.”

C-37. Env-Wq 1703.21, titled “Water Quality Criteria for Toxic Substances”, states in part:

“(a) Unless naturally occurring or allowed under part Env-Wq 1707, all surface waters shall be free from toxic substances or chemical constituents in concentrations or combinations that:

(1) Injure or are inimical to plants, animals, humans or aquatic life; or

(2) Persist in the environment or accumulate in aquatic organisms to levels that result in harmful concentrations in:

a. Edible portions of fish, shellfish, or other aquatic life; or

b. Wildlife that might consume aquatic life. [...]”

C-38. Env-Wq 1705.01, titled “Assimilative Capacity”, under Part Env-Wq 1705, titled “Flow Standards”, states in part:

“(a) [...] the department shall hold not less than 10 percent of the assimilative capacity of each surface water in reserve to provide for future needs.

C-39. Antidegradation provisions are included in Env-Wq 1702 and Env-Wq 1708.

a. Env-Wq 1702.03 defines “antidegradation” as “a provision of the water quality standards that maintains and protects existing water quality and uses.”

b. Env-Wq 1708.02 states: “Antidegradation shall apply to: (a) Any proposed new or increased activity, including point source and nonpoint source discharges of pollutants, that would lower water quality or adversely affect the existing or designated uses; (b) Any proposed increase in loadings to a waterbody when the proposal is associated with existing activities; (c) Any increase in flow alteration over an existing alteration; and (d) Any hydrologic modifications, such as dam construction and water withdrawals.”

c. Antidegradation applies to all parameters as evidenced by Env-Wq 1708.08(a) under

⁴ State of New Hampshire 2020/2022 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology. New Hampshire Department of Environmental Services. February 18, 2022 R-WD-20-20. [2020/2022 CALM \(nh.gov\)](https://www.nh.gov/2020/2022-CALM).

“Assessing Waterbodies”, which states: “The applicant shall characterize the existing water quality and determine if there is remaining assimilative capacity for each parameter in question.”

- d. Env-Wq 1708.03(a) states: “A proposed discharge or activity shall not eliminate any existing uses or the water quality needed to maintain and protect those uses.”
- e. Env-Wq 1702.04 defines “assimilative capacity” as “the amount of a pollutant or combination of pollutants that can safely be released to a waterbody without causing violations of applicable water quality criteria or negatively impacting uses.”
- f. Env-Wq 1708.08 describes the process for assessing waterbodies to determine if there is remaining assimilative capacity for each parameter in question, including the requirement under Env-Wq 1708.08(h) for the department to reserve no less than 10% of a surface water’s assimilative capacity as specified under Env-Wq 1705.01 (see Fact C-38).
- g. Env-Wq 1708.09, titled “Significant or Insignificant Determination”, states in part: “(a) Any discharge or activity that is projected to use 20% or more of the remaining assimilative capacity for a water quality parameter, in terms of either concentration or mass of pollutants, or volume or flow rate for water quantity, shall be considered a significant lowering of water quality. (b) The department shall not approve a discharge or activity that will cause a significant lowering of water quality unless the applicant demonstrates, in accordance with Env-Wq 1708.10, that the proposed lowering of water quality is necessary to achieve important economic or social development in the area where the waterbody is located. (c) [...] any applicant proposing an activity that will cause an insignificant lowering of water quality shall not be required to demonstrate that the activity is necessary to provide important economic or social development, provided the applicant implements best management practices to minimize degradation.”
- h. Env-Wq 1708.01(b)(1), in general, states that for significant changes in water quality, where the quality of the surface waters exceeds levels necessary to support propagation of fish, shellfish, and wildlife, and recreation in and on the water, that quality shall be maintained and protected unless the department finds, after full satisfaction of the intergovernmental coordination and public participation provisions and the analysis required by Env-Wq 1708.10, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the surface waters are located. In allowing such degradation or lower water quality, the department shall ensure water quality adequate to fully protect existing uses. Further, the department shall ensure that the highest statutory and regulatory requirements shall be achieved for all new and existing point sources and that all cost effective and reasonable best management practices for nonpoint source control shall be implemented.
- i. Env-Wq 1708.01(b)(2) states: “The department shall not approve any proposed discharge or activity that might cause degradation or lower water quality, without such conditions as are necessary to ensure that: a. Water quality will be adequate to protect existing uses; b. The highest statutory and regulatory requirements will be achieved for all new and existing point sources; and c. All cost effective and reasonable best management practices for nonpoint source control will be implemented.”

C-40. Env-Wq 1708.04, titled “Protection of Water Quality in ORW”, states:

“(a) Surface waters of national forests and surface waters designated as natural under RSA 483:7-a, I, shall be considered outstanding resource waters (ORW).

(b) Subject to (c), below, water quality shall be maintained and protected in surface waters that constitute ORW.

(c) The department shall allow a limited point or nonpoint source discharge to an ORW only if:

- (1) The discharge will result in no more than temporary and short-term changes in water quality, wherein “temporary and short-term” means that degradation is limited to the

shortest possible time;

- (2) The discharge will not permanently degrade water quality or result at any time in water quality lower than that necessary to protect the existing and designated uses in the ORW; and
- (3) All practical means of minimizing water quality degradation are implemented.”

C-41. Env-Wq 1708.05, titled “Protection of Class A Waters”, states:

“(a) As specified in RSA 485-A:8, I, discharges of sewage or waste to class A waters shall be prohibited.

(b) Proposed new or increased activities that the department determines do not involve the discharge of sewage or waste shall be reviewed in accordance with this part.”

C-42. Env-Wq 1708.06 titled “Protection of Water Quality in High Quality Waters” states the following:

“(a) Subject to (b) through (d) below, high quality waters shall be maintained and protected.

(b) The department shall evaluate and authorize insignificant changes in water quality as specified in Env-Wq 1708.09.

(c) The department shall allow degradation of significant increments of water quality, as determined in accordance with Env-Wq 1708.09, in high quality waters only if the applicant can demonstrate to the department, in accordance with Env-Wq 1708.10, that allowing the water quality degradation is necessary to accommodate important economic or social development in the area in which the receiving water is located.

(d) If the waterbody is Class A Water, the requirements of Env-Wq 1708.05 shall also apply.”

C-43. Env-Wq 1708.12(a) states that ““transfer” means the intentional conveyance of water from one surface water to another surface water for the purpose of increasing volume of water available for withdrawal from the receiving surface water. The term does not include the transfer of stormwater, for the purpose of managing stormwater during construction, between basins created or otherwise lawfully used for stormwater detention or treatment, or both, and does not include the discharge of stormwater from a detention or treatment basin to a surface water.”

C-44. The Cocheco River in the vicinity of the Project is Class B under New Hampshire Chapter Law 1961, 40:1, X and 1967, 147:15.

State Rivers Management and Protection Program

C-45. NH RSA 483:2 established the New Hampshire Rivers Management and Protection Program within NHDES, and states in part: “It is the intent of the legislature that the New Hampshire rivers management and protection program shall complement and reinforce existing state and federal water quality laws, and that in-stream flows are maintained along protected rivers, or segments thereof, in a manner that will enhance or not diminish the enjoyment of outstanding river characteristics pursuant to RSA 483:1 [Statement of Policy]. It is also the intent of the legislature that, through said program, the outstanding characteristics including recreational, fisheries, wildlife, environmental, hydropower, cultural, historical, archaeological, scientific, ecological, aesthetic, community significance, agricultural, public water supply, instream public uses, and riparian rights of such rivers shall be restored, protected, and maintained, and notwithstanding the provisions of RSA 483-B [Shoreland and Water Quality Protection Act], that nothing in this chapter shall be interpreted to preempt any land and zoning authority granted to municipal bodies under RSA title LXIV [Planning and Zoning].”

C-46. NH RSA 483:4, VIII defines “designated river” as “that portion of a perennial river which has been

specifically designated by the general court pursuant to RSA 483:15.”

- C-47. NH RSA 483:4, XI defines "instream public uses" as “those uses which comprise the state's interests in surface waters including, but not limited to: navigation; recreation; fishing; storage; conservation; maintenance and enhancement of aquatic and fish life; fish and wildlife habitat; wildlife; the protection of water quality and public health; pollution abatement; aesthetic beauty; and hydroelectric energy production.”
- C-48. RSA 483:4, XVI defines "protected instream flow" as “a stream flow pattern which is established to maintain water for present and future instream public uses.”
- C-49. NH RSA 483:7-a, titled “River Classification Criteria; Management”, states in part:
“I. Those rivers or segments designated for inclusion in the program shall be classified as one or more of the following: [...]
- (d) Community rivers are those rivers or segments which flow through developed or populated areas of the state and which possess existing or potential community resource values, such as those identified in official municipal plans or land use controls. Such rivers have mixed land uses in the corridor reflecting some combination of open space, agricultural, residential, commercial and industrial land uses. Such rivers are readily accessible by road or railroad, may include existing impoundments or diversions, or potential sites for new impoundments or diversions for hydropower, flood control or water supply purposes, and may include the urban centers of municipalities. The following criteria and management objectives shall apply to community rivers:
 - (1) The minimum length of any segment shall be one half mile.
 - (2) Existing water quality shall be at least Class B level pursuant to the water quality standards established under RSA 485-A:8, or have the potential for restoration to that level.
 - (3) Management of community rivers and segments shall maintain and enhance the natural, scenic, recreational and community values of the river and shall consider, protect, and ensure the rights of riparian owners to use the river for such uses as agricultural, forest management, public water supply, residential, recreational, commercial, industrial, flood control and hydroelectric energy production purposes which are compatible with the instream public uses of the river and the management and protection of the resources for which the river or segment is designated.”
- C-50. NH RSA 483:9-b, titled “Community Rivers Protection”, states in part:
“II. The department may approve permits and certificates for the construction, operation, or maintenance of new hydroelectric power facilities at existing or breached dams provided that:
 - (a) The operational mode of any proposed facility shall be run-of-the-river, with project outflow equal to project inflow on an instantaneous basis and the project does not significantly alter the natural flow characteristics of the river; and
 - (b) The proposed facility does not provide for diversion of the river or segment above or below the existing dam for a significant distance; and
 - (c) The height of the impoundment is constant and, for existing or breached dams, is not raised above the maximum historic level of impoundment at that site; and
 - (d) The proposed facility provides adequate fish passage as determined by the fish and game department.
- III. No interbasin transfers of water from a designated community river or segment shall be permitted.
IV. No new channel alteration activities shall be permitted which interfere with or alter the natural flow characteristics of the river or segment or which adversely affect the resources for which the river or segment is designated. However, the commissioner may approve such channel alterations as may be

necessary for the construction, repair, or maintenance of a project including public water supply intake facilities in the river or river corridor. The department shall encourage the use of native vegetation to stabilize streambanks of designated community rivers.

V. A protected instream flow shall be established by the commissioner for each designated community river or segment and any upstream impoundment or diversion facility which may affect the natural flow characteristics of such river or segment pursuant to RSA 483-A:9-c.

VI. Water quality shall be restored or maintained at least at the Class B level. Significant adverse impacts on water quality or other instream public uses shall not be permitted. The department shall review and consider adopted local river corridor management plans prior to issuing any permit under RSA 485-A:13, RSA 485-A:17 or RSA 482-A.”

C-51. NH RSA 483:9-c, titled “Establishment of Protected Instream Flows”, states in part:

“I. The commissioner, in consultation with the advisory committee, shall adopt rules under RSA 541-A specifying the standards, criteria, and procedures by which protected instream flows shall be established and enforced for each designated river or segment. [...]

VI. Water management plans implementing instream flow protections shall be effective and enforceable upon adoption.”

C-52. NH RSA 483:10-b, titled “Withholding of Section 401 Certification”, states: “The general court finds that the development of any dam or channel alteration activities within a natural river or segment or the development of any new dam within a rural or community river or segment, except as provided in RSA 483:9-a, II and RSA 483:9-b, II, will alter the physical and chemical characteristics of that river and will constitute violation of the water quality standards established under RSA 485-A:8. The commissioner shall deny certification of any federally licensed or permitted activity on such designated rivers or segments under section 401 of the Federal Water Pollution Control Act, P.L. 92-500, as amended.”

NH RSA 483:9-a, II referenced in this paragraph specifies the same provisions as NH RSA 483:9-b, II, except refers to a “rural-community river” segment of the Cocheco River designated under NH RSA 483:15, XVI(c) instead of a “community river” segment of the Cocheco River designated under NH RSA 483:15, XVI(f) [see Facts C-50 and C-54].

C-53. NH RSA 483:12-a, titled “State Action; Notification of Rivers Coordinator; Petition for Review”, states: “ I. Any state agency considering any action affecting any river or segment designated under this chapter shall notify the rivers coordinator and the local river management advisory committee prior to taking any such action. Such agency shall forward to the rivers coordinator and the local river management advisory committee for review and comment copies of all notices of public hearings, or, where a public hearing is not required, a copy of the application for issuance of a permit, certificate, or license within the designated river or corridor under RSA 485-C, RSA 485-A, RSA 483-B, RSA 12-E, RSA 270:12, RSA 482, RSA 482-A, except notifications for minimum impact activities under RSA 482-A:3, V and XII and for routine roadway maintenance under RSA 482-A:3, XVI on land used for agricultural purposes, RSA 149-M, RSA 430, or RSA 147-A. If an agency is notified by the rivers coordinator that a proposed activity would violate a protection measure under RSA 483:9, 483:9-a, 483:9-aa, or 483:9-b, such agency shall deny the application.”

C-54. NH RSA 483:15, XVI(f) designates the Cocheco River as a community river from Whittier Street crossing in Dover to head of tide at Central Ave dam in Dover.

New Hampshire Water Use Registration and Reporting Program

C-55. NH RSA 488 established the New Hampshire Water Use Registration and Reporting Program (WURRP)

within NHDES, and NH RSA 488:1 states: “Statement of Purpose. – This chapter provides for uniform statewide collection of water use data to understand how water resources are utilized in the state by establishing procedures and standards for the registration, measurement, and reporting of water use. The legislature recognizes the fundamental importance of water resources and intends to provide a framework to obtain and maintain basic water use data for the state. The legislature recognizes that information describing the major water uses of the state along with assessing the amount of water in a given watershed or aquifer are integral to all water resource quantity assessments and management decisions. Water use data is necessary to understand the effects of cumulative uses, transfers, discharges, and consumptive water losses in aquifers and watersheds in the state. Water use data also identifies the quantity and timing of existing water uses, and this information can be used to estimate future water needs of the state. Water use data is also necessary for verifying compliance with and equitable enforcement of state laws pertaining to groundwater and surface water.”

- C-56. NH RSA 488:3, states: “I. No person shall withdraw or discharge a cumulative amount of more than 20,000 gallons of water per day, averaged over any 7-day period, or more than 600,000 gallons of water over any 30-day period, at a single real property or place of business without registering the withdrawal or discharge with the department. Transfers of such volume of water shall also be registered. Registration shall be in addition to any required permits. II. No registration shall be transferred to another person without written notification to the commissioner.”
- C-57. Env-Wq 2102 includes requirements for water use registration and reporting and applies to any person required to register a water use under NH RSA 488:3, I, namely any person whose cumulative incoming water or cumulative outgoing water exceeds an average of 20,000 gallons of water per day in any 7-day period, or exceeds a total volume of 600,000 gallons in any 30-day period (see Fact C-56). Env-Wq 2102.07 requires each water user that is not an agriculture water user, a limited water user, or the owner of a mobile facility that qualifies for an intermittent registration under Env-Wq 2102.32(a)(1) to report water use in accordance with Env-Wq 2102.07.
- C-58. The Applicant is required to register and report water use of the Project with the NHDES WURRP because the Project’s cumulative incoming water or cumulative outgoing water exceeds an average of 20,000 gallons of water per day in any 7-day period or exceeds a total volume of 600,000 gallons in any 30-day period.
- C-59. Records maintained by the NHDES WURRP show that the Applicant is a registered water user and water use of the Project has been reported since 1992.

New Hampshire Water Conservation Program

- C-60. NH RSA 485:61, titled “Rules for Water Conservation”, states the following regarding rules for NHDES’ Water Conservation Program:
- “I. The department shall adopt rules, pursuant to RSA 541-A, for water conservation practices for water users. These rules shall strike a reasonable balance between environmental, energy, and economic impacts and be consistent with current industry standards and practices for different types of water users.
 - II. The water conservation rules in paragraph I of this section shall apply to all new permit applicants and applications for water withdrawals subject to the provisions of RSA 485:3, RSA 485:48, RSA 485-C:21 and section 401 of the Clean Water Act.
 - III. Water conservation rules shall be consistent with applicable state or federal rules and regulations.”

Water Conservation Rules were adopted May 14, 2005 and currently codified as Env-Wq 2101.

C-61. Env-Wq 2101.05(f) states the following: “The owner of a conservation system that is, in whole or in part, an ICI water user shall comply with the requirements specified in Env-Wq 2101.13 and Env-Wq 2101.19 through Env-Wq 2101.22.”

C-62. Env-Wq 2101.24 titled, “Water Conservation Plan Required”, states, in relevant part, the following:

“(a) The applicants for approval of a source that would be a conservation source shall submit a water conservation plan that demonstrates compliance with the applicable provisions of Env-Wq 2101.05 through Env-Wq 2101.22 in accordance with the following:”

“(5) For a new withdrawal from a surface water associated with a project requiring a 401 Water Quality Certification, the water conservation plan shall be submitted prior to or in conjunction with the application for a 401 Water Quality Certification pursuant to Section 401 of the federal Clean Water Act;”.

C-63. Env-Wq 2101.23, titled “Waivers”, allows NHDES to grant waivers of certain provisions in Env-Wq 2101, provided the person requesting the waiver submits a written request to NHDES that includes the information specified in Env-Wq 2101.23(d).

C-64. On October 8, 2021, the Applicant submitted to NHDES a request to waive the requirements of Env-Wq 2101.05(f) (see Facts C-61 and C-63) for the Project. On October 14, 2021, the NHDES Water Conservation Program approved the waiver request in accordance with Env-Wq 2101.23 with the following conditions: “The waiver shall be valid for no more than four years from the date of this approval. Prior to the expiration of the waiver, a waiver request shall be sought in order to be considered an extension of the original waiver approval.”

New Hampshire Coastal Zone Program

C-65. Section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA) (16 U.S.C. 1456) states: “After final approval by the Secretary of a state's management program, any applicant for a required Federal license or permit to conduct an activity, in or outside of the coastal zone, affecting any land or water use or natural resource of the coastal zone of that state shall provide in the application to the licensing or permitting agency a certification that the proposed activity complies with the enforceable policies of the state's approved program and that such activity will be conducted in a manner consistent with the program. At the same time, the applicant shall furnish to the state or its designated agency a copy of the certification, with all necessary information and data. Each coastal state shall establish procedures for public notice in the case of all such certifications and, to the extent it deems appropriate, procedures for public hearings in connection therewith. At the earliest practicable time, the state or its designated agency shall notify the Federal agency concerned that the state concurs with or objects to the applicant's certification. If the state or its designated agency fails to furnish the required notification within six months after receipt of its copy of the applicant's certification, the state's concurrence with the certification shall be conclusively presumed. No license or permit shall be granted by the Federal agency until the state or its designated agency has concurred with the applicant's certification or until, by the state's failure to act, the concurrence is conclusively presumed, unless the Secretary, on his own initiative or upon appeal by the applicant, finds, after providing a reasonable opportunity for detailed comments from the Federal agency involved and from the state, that the activity is consistent with the objectives of this chapter or is otherwise necessary in the interest of national security.”

- C-66. The New Hampshire Coastal Program of NHDES is the designated agency in New Hampshire that reviews, and then concurs with or objects to, an applicant's CZMA Federal consistency certification that a proposed activity complies with the enforceable policies of the state's approved coastal zone program and the activity will be conducted in a manner consistent with the program.

CWA Section 303(d) List, TMDLs, and Requirements for Impaired Waters

- C-67. Section 303(d) of the Clean Water Act (33 U.S.C. 1313(d)) and the regulations promulgated thereunder (40 C.F.R. 130.0 – 40 C.F.R. 130.11) require states to identify and list surface waters that are violating state water quality standards (i.e., Section 303(d) List) that do not have an approved Total Maximum Daily Load (TMDL) for the pollutants causing impairment. For these water quality-impaired waters, states must establish TMDLs for the pollutants causing the impairments and submit the list of impaired surface waters and TMDLs to the U.S. Environmental Protection Agency (EPA) for approval. TMDLs include source identification, determination of the allowable load and pollutant reductions (by source) necessary to meet the allowable load. Once a TMDL is conducted, the pollutant/surface water is transferred to the list of impaired waters with approved TMDLs (known as Category 4A waters). The Section 303(d) List is, therefore, a subset of all impaired waters. The most recent Section 303(d) list of impaired waters submitted to EPA is the [2020/2022 Section 303\(d\) List](#). A list of all impaired waters is available through the [NHDES website](#).
- C-68. On December 20, 2007, EPA approved the [Northeast Regional Mercury TMDL](#) which addressed mercury impairments in all New Hampshire fresh surface waters. Surface waters within the boundary of the Project are subject to this TMDL.
- C-69. On September 21, 2010, EPA approved the [Statewide Bacteria TMDL](#) for 394 surface waters listed as impaired on the 2008 303(d) List of impaired waters. Surface waters within the boundary of the Project are subject to this TMDL.
- C-70. When a surface water does not meet Surface Water Quality Standards (i.e., when it is impaired), Env-Wq 1703.01 (b) (see Fact C-25) states that "All surface waters shall be restored to meet the water quality criteria for their designated classification including existing and designated uses, and to maintain the chemical, physical, and biological integrity of surface waters." Further, the addition of pollutants causing or contributing to impairment should be avoided as indicated in the following regulation and statute:
- Env-Wq 1703.03 (a) (see Fact C-26) states that "The presence of pollutants in the surface waters shall not justify further introduction of pollutants from point or nonpoint sources, alone or in any combination."
- NH RSA 485-A:12, I (Enforcement of Classification) states that "After adoption of a given classification for a stream, lake, pond, tidal water, or section of such water, the department shall enforce such classification by appropriate action in the courts of the state, and it shall be unlawful for any person or persons to dispose of any sewage, industrial, or other wastes, either alone or in conjunction with any other person or persons, in such a manner as will lower the quality of the waters of the stream, lake, pond, tidal water, or section of such water below the minimum requirements of the adopted classification."

Section 401 Water Quality Certification Application and Other Relevant Information

- C-71. On December 29, 2020, pursuant to 18 CFR §4.61, the Applicant filed with FERC an Application for a Subsequent License for Minor Water Power Project for the Project (also referred to herein as the Final License Application or FLA).⁵
- C-72. On October 8, 2021, the U.S. Department of Interior (USDI) through the U.S. Fish and Wildlife Service (USFWS) filed a letter with FERC to provide comments, recommendations, and prescriptions for the Project to prevent loss of, or damage to, fish and wildlife resources.⁶ The USFWS letter was in response to FERC's Ready for Environmental Analysis that FERC issued on August 12, 2021 for relicensing proceedings for the Project.⁷ The letter includes, among other things, the USFWS' recommendations under section 10(j) of the Federal Power Act, as amended, (16 U.S.C. 791a-828c) (FPA) and the preliminary fishway prescription that USDI provided in accordance with the section 18 of the FPA through USFWS (the Preliminary Prescription for Fishways).^{8,9}
- C-73. On October 11, 2021, NHDES received from the Applicant an application for a CWA Section 401 water quality certification (WQC) for the Project (certification application or certification request). The record for this certification decision includes the information provided in the certification application as well as information filed with FERC for this relicensing through September 21, 2022.
- C-74. On October 12, 2021, the New Hampshire Fish and Game Department (NHFGD) filed a letter with FERC to respond to FERC's Notice of Application Accepted for Filing and Ready for Environmental Analysis that FERC filed on August 12, 2021 for relicensing proceedings for the Project.^{10,7}
- C-75. On October 27, 2021, FERC issued a "Notice of Waiver Period for Water Quality Certification Application" which stated that if NHDES did not act on the certification application for the Project by October 11, 2022, NHDES' certifying authority would be deemed waived pursuant to section 401(a)(1) of the Clean Water Act, 33 U.S.C. § 1341(a)(1)¹¹.
- C-76. On September 21, 2022, FERC prepared and filed an "Environmental Assessment for Hydropower License" for the Project in accordance with the National Environmental Policy Act of 1969 and FERC's

⁵ FERC Document Accession No. 20201229-5240

⁶ FERC Document Accession No. 20211008-5054 (USFWS letter with comments, recommendations, and prescriptions for the Project)

⁷ FERC Document Accession No. 20210812-3045 (FERC Notice of Application Accepted for Filing and Ready for Environmental Analysis)

⁸ Section 10(j) of the FPA requires FERC to consider federal and state fish and wildlife agency recommendations pursuant to the Fish and Wildlife Coordination Act to protect, mitigate damages to, and enhance fish and wildlife resources. "That in order to adequately and equitably protect, mitigate damages to, and enhance, fish and wildlife (including related spawning grounds and habitat) affected by the development, operation, and management of the project, each license issued under this Part shall include conditions for such protection, mitigation, and enhancement. Subject to paragraph (2), such conditions shall be based on recommendations received pursuant to the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) from the National Marine Fisheries Service, the United States Fish and Wildlife Service, and State fish and wildlife agencies". FERC can alter or reject Section 10(j) recommendations by following prescribed procedures in Section 10(j)(2).

⁹ Section 18 of the FPA authorizes the USFWS or NMFS to prescribe upstream and downstream fishway passage requirements. "The Commission shall require the construction, maintenance, and operation by a licensee at its own expense of such lights and signals as may be directed by the Secretary of the Department in which the Coast Guard is operating, and such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate". Section 18 fishway prescriptions are mandatory; FERC cannot alter them.

¹⁰ FERC Document Accession No. 20211012-5666 (NHFGD comment letter)

¹¹ FERC Document Accession No. 20211027-3012

regulations under 18 CFR Part 380 to assess the environmental and economic effects associated with the Project and alternatives to the proposed Project.¹²

- C-77. Natural Resource Agencies include, but are not limited to, NHDES, NHFGD, USFWS, and NMFS, as defined in footnote 13.
- C-78. NHDES posted a draft version of this 401 certification for public comment from August 29, 2022 to 4 p.m. on September 28, 2022. NHDES received comments from the Applicant and USFWS on the draft certification.

D. FINDINGS

- D-1. The Applicant submitted an Application to FERC for a Subsequent License for Minor Water Power Project for the Project (also referred to herein as the Final License Application or FLA) (see Fact C-71).
- D-2. The Applicant submitted a request to NHDES for a water quality certification for the Project required under section 401 of the CWA and NH RSA 485-A:12, III (see Facts C-1, C-8, and C-73).

Existing and Proposed Project Facilities and Operation

- D-3. *Background:* The Project is located on the Cocheco River in Strafford County, New Hampshire. The infrastructure of the Project is located within the City of Dover, New Hampshire. The Project dam, known as the Cocheco Falls Dam, is owned by the City of Dover, located just downstream Central Avenue Bridge and approximately three miles upstream of the Cocheco River's confluence with the Salmon Falls River, and is the third hydropower dam on the Cocheco River. The City of Dover leases the dam to the Applicant. At the Project dam, the total drainage area of the Cocheco River is approximately 175 square miles, which is about 94.6 percent of the Cocheco River watershed, which is approximately 185 square miles. The headwaters of the Cocheco River begin in the towns of Strafford, Farmington, Middleton, and New Durham, New Hampshire. The Cocheco River originates in New Durham, New Hampshire and generally flows southeasterly for approximately 34.6 miles to its tidal limits at the Cocheco Falls Dam. The Cocheco River and the Salmon Falls River join in Dover approximately 3 miles downstream from the Project, to form the Piscataqua River. The Piscataqua River flows for approximately 10.5 miles before reaching Portsmouth Harbor, which empties into the Gulf of Maine. The median annual inflow in the Cocheco River at the Project was approximately 210 cubic feet per second (cfs) for the period of record December 2, 2002 through July 9, 2019.
- D-4. *Existing Project Facilities and Operation:* FERC provided the following description of the Project, among other descriptions of the Project, in the environmental assessment that it filed on September 21, 2022 (see Fact C-76):

"The Cocheco Project includes a 174.5-foot-long, 11-foot-high stone masonry arch dam that includes the following sections: (1) a 4-foot-long north abutment section; (2) a 150-foot-long spillway section with 2-foot-high flashboards and a crest elevation of 36.25 feet National Geodetic Vertical Datum of 1929 (NGVD 29) at the top of the flashboards; (3) a 6-foot-long section with a 4-foot-wide, 9-foot-

¹² FERC Document Accession No. 20220921-3006

¹³ NHDES means New Hampshire Department of Environmental Services; NHFGD means New Hampshire Fish and Game Department; USFWS means United States Fish and Wildlife Service of the US Department of Interior (USDI); NMFS means National Marine Fisheries Service of the National Oceanic and Atmospheric Administration (NOAA).

high debris sluice gate; (4) an 11.5-foot-long Denil fish ladder;⁶ and (5) a 3-foot-long south abutment section. The dam creates an impoundment that has a surface area of 33.2 acres at an elevation of 36.25 feet NGVD 29.^[14] [...]

From the impoundment, water flows through a 64-foot-wide, 10-foot-high intake structure, located in the north abutment approximately 60 feet upstream of the spillway, equipped with a trashrack with 1-inch clear bar spacing to an 8.5-foot-diameter, 184-foot-long gated steel penstock that trifurcates into three 5-foot-diameter, 8-foot-long sections, each controlled by a butterfly valve. The penstock provides water to three 238-kW Flygt propeller turbine-generator units located in a 40-foot-long, 40-foot-wide concrete and brick masonry powerhouse, for a total installed capacity of 714 kW. Water is discharged from the turbines through draft tubes to an approximately 40-foot-long, 40-foot-wide tailrace, where it returns to the Cocheco River. The project creates an approximately 200-foot-long bypassed reach. [...]

The project includes a downstream fish passage facility that consists of: (1) a 5.6-foot-wide, 7-foot-long fish collection box approximately 50 feet upstream of the dam on the north side of the impoundment, that includes a 5.6-foot-wide, 6-foot-high trashrack with 6-inch clear bar spacing; and (2) an approximately 127-foot-long, 24-inch-diameter PVC fish passage pipe that discharges to a plunge pool downstream of the dam.^[15] [...]

[The Applicant] voluntarily operates the project in a modified run-of-river mode using an automatic pond level control system, such that outflow from the project approximates inflow to the impoundment on a daily basis.^[16] Under normal operating conditions, [the Applicant] maintains the surface elevation of the impoundment at the flashboard crest elevation of 36.25 feet NGVD 29, with a typical drawdown of approximately 2 inches below the crest (i.e., 36.08 feet NGVD 29) when generating electricity.^[17] [...]

The current license requires the following minimum flow releases to facilitate upstream anadromous fish passage: (1) 20 cubic feet per second (cfs) to New Hampshire FGD's Denil fish ladder from April 15 through June 30; and (2) 20 cfs through the debris sluice gate from April 15 through June 15, to attract anadromous fish to New Hampshire FGD's Denil fish ladder. The current license requires 20 cfs to be released through the downstream fish passage facility to facilitate downstream anadromous fish passage from April 15 until ice forms on the river. In addition, during the fall, CFA must provide the following flows to facilitate upstream passage for Atlantic salmon: (1) 20 cfs to New Hampshire FGD's Denil fish ladder and 20 cfs from the spillway for 30 days following a

¹⁴ FERC stated the following in a footnote of its environmental assessment for the Project: "The current project boundary includes an approximately 47-acre impoundment; however, the current license does not identify the corresponding impoundment surface elevation. In the relicensing application, [the Applicant] states that the impoundment is approximately 20 acres at an elevation of 36.25 feet NGVD 29. Staff used the georeferenced shapefile of the project boundary that was filed by the applicant as part of the license application to calculate the impoundment surface area. Based on the shapefile, staff concludes that the impoundment surface area is approximately 33.2 acres at an elevation of 36.25 feet NGVD 29."

¹⁵ FERC stated the following in a footnote of its environmental assessment for the Project: "The plunge pool is approximately two feet deep at low tide and six feet deep at high tide."

¹⁶ FERC stated the following in a footnote of its environmental assessment for the Project: "[The Applicant] describes project operation as 'run-of-river.' Under a typical run-of-river operation, outflow approximates inflow at any given point in time. Because run-of-river for this project is defined on a daily basis rather than at any given point in time, staff refers to it as 'modified run-of-river.'"

¹⁷ FERC stated the following in a footnote of its environmental assessment for the Project: "Impoundment level sensor specifications filed on April 26 and May 12, 2022, indicate that [the Applicant] can maintain the impoundment levels with an accuracy of approximately ± 0.3 inch around the target surface elevation."

flow increase of 250% in the Cocheco River during the period of September 15 through September 30; or (2) 20 cfs to New Hampshire FGD's Denil fish ladder and 20 cfs from the spillway for 30 days from October 1 to October 30.

In practice, CFA releases the 20-cfs minimum flow through the debris sluice gate for an additional 15 days (April 15 through June 30, instead of June 15), such that the total minimum bypassed reach flow from April 15 through June 30, is 60 cfs. In addition, CFA provides 20 cfs through the downstream fish passage facility through December 31, instead of until ice formation, such that the total minimum bypassed reach flow from July 1 through December 31 is 20 cfs.

When inflow is greater than the minimum bypassed reach flows, CFA withdraws water from the impoundment to generate electricity. The three turbine-generators each have a hydraulic capacity of 100 cfs. The turbines do not have the ability to ramp up or down when operating. If inflow is less than 100 cfs plus the minimum bypassed reach flow, CFA draws down the impoundment by about 2 inches (i.e., from 36.25 to 36.08 feet NGVD 29) to supplement inflow for one of the turbines to generate electricity. If inflow is less than 200 cfs plus the minimum bypassed reach flow, CFA draws down the impoundment by about 2 inches to supplement inflow for a second turbine to also generate electricity. Similarly, if inflow is less than 300 cfs plus the minimum bypassed reach flow, CFA draws down the impoundment by about 2 inches to supplement inflow for a third turbine to also generate electricity. When inflow is greater than 300 cfs plus the minimum bypassed reach flow, CFA operates all three turbine-generator units continuously and releases excess flow from the spillway. Depending on inflow and project generation, the impoundment can fluctuate several times a day between an elevation of 36.08 feet and the flashboard crest elevation of 36.25 feet NGVD 29. The average annual energy production of the project from 2014 to 2018 was 1,437.7 MWh [megawatt-hours].”

- D-5. *Proposed Project Normal Operation:* In FERC's environmental assessment for the Project that FERC filed on September 21, 2022, FERC provided the following description of the Applicant's proposed operation of the Project, among other descriptions of proposed operation of the Project (see Fact C-76):

“[The Applicant] proposes to continue operating the project in modified run-of-river mode where outflow approximates inflow on a daily basis. [The Applicant] proposes to limit impoundment drawdowns to approximately 1 inch (from 36.25 to 36.17 feet NGVD 29) as described in Table C-1, instead of the current operation of lowering the impoundment approximately 2 inches when generating electricity (from 36.25 to 36.08 feet NGVD 29) [...]

[The Applicant] proposes to continue to facilitate upstream anadromous fish passage by providing 20 cfs to the [NHFGD's] Denil fish ladder and 20 cfs through the debris sluice gate from April 15 through June 30. [The Applicant] also proposes to continue to operate and maintain the downstream fish passage facility from April 15 through December 31, including by releasing 20 cfs through the facility, to provide passage for shad, river herring, and eels. [...]

Table C-1. Proposed Project Operation.

River Flow (cfs)	Project Operation
<i>January 1 through April 14</i>	
From 0 to 100	Unit one operating within one inch of flashboard crest.
From 100 to 200	Unit one operating continuously, and unit two operating using water stored within 0.5 inch of flashboard crest.
From 200 to 300	Units one and two operating continuously, and unit three operating using water stored within 0.5 inch of flashboard crest.
More than 300	All three units operating continuously, and flow in excess of 300 cfs released over the dam.
<i>April 15 through June 30</i>	
From 0 to 60	Available flow released through the fish ladder, sluiceway, and downstream fish passage facility.
From 60 to 160	60 cfs released through the fish ladder, sluiceway, and downstream fish passage facility (20 cfs from each). Unit one operating using water stored within 0.5 inch of flashboard crest.
From 160 to 260	60 cfs released through the fish ladder, sluiceway, and downstream fish passage facility (20 cfs from each). Unit one operating continuously, and unit two operating using water stored within 0.75 inch of flashboard crest.
From 260 to 360	60 cfs released through the fish ladder, sluiceway, and downstream fish passage facility (20 cfs from each). Units one and two operating continuously, and unit three operating using water stored within one inch of flashboard crest.
More than 360	60 cfs released through the fish ladder, sluiceway, and downstream fish passage facility (20 cfs from each). All three units operating continuously, and flow in excess of 360 cfs released over the dam.

[Table C-1 Continued]

River Flow (cfs)	Project Operation
<i>July 1 through December 31</i>	
From 0 to 20	Available flow released through the downstream fish passage facility.
From 20 to 120	20 cfs released through the downstream fish passage facility. Unit one operating within 0.5 inch of flashboard crest.
From 120 to 220	20 cfs released through the downstream fish passage facility. Unit one operating continuously, and unit two operating within 0.75 inch of flashboard crest.
From 220 to 320	20 cfs released through the downstream fish passage facility. Units one and two operating continuously, and unit three operating within one inch of flashboard crest.
More than 320	20 cfs released through the downstream fish passage facility. All three units operating continuously, and flow in excess of 320 cfs released over the dam.

- D-6. *Applicant’s Proposed Project Operation and Environmental Measures:* The Applicant provided the following descriptions of the proposed project operation and environmental measures of the Project in portions of the Final License Application (see Fact C-71 and Findings D-4 and D-5):
- a. Continue to operate the Project in a run-of-river mode, where inflow approximately matches outflow;
 - b. Continue to facilitate upstream and downstream fish passage in cooperation with NHFGD by passing a flow of 20 cfs from the upstream fish passage facility April 15 until June 30; an attraction flow of 20 cfs at the spillway from April 15 until June 15; and a flow of 20 cfs through the downstream fish passage facility from April 15 until ice forms on the river;
 - c. Design and install upstream eel passage at the right bank Denil location within 4 years of the effective date of the renewed license in consultation and cooperation with state and federal resource agencies; and
 - d. When flashboards fail, they will be repaired as soon as river flow, worker safety, and Project operations permit.

CWA Section 401 Water Quality Certification Required

- D-7. The Cocheco River is waters of the United States (see Facts C-6 and C-7).
- D-8. The Cocheco River is surface waters of the state (see Fact C-12).
- D-9. The Project may include discharges from upstream of the Project dam to downstream of the dam including, but not limited to, through the turbines and various gates or over the dam spillway (see Fact C-5 and Findings D-4, D-5, and D-6).
- D-10. Because the Project may involve discharges, as that term is used in the CWA, to waters of the United

States in New Hampshire, and because the Project requires a federal license, a section 401 of the CWA water quality certification is required from New Hampshire (see Facts C-1 and C-8, and Findings D-1, D-2, D-7 through D-9).

- D-11. NHDES is the authority (i.e., certifying authority) responsible for issuing CWA Section 401 water quality certifications in New Hampshire (see Facts C-3 and C-8).

New Hampshire Authority for Certification Conditions, Modifications and Monitoring

- D-12. RSA 485-A:12, III (Fact C-8) states the following: “Certification shall include any conditions on, modifications to, or monitoring of the proposed activity necessary to provide assurance that the proposed discharge complies with applicable surface water quality standards.” Monitoring includes, but is not limited to, the following:
- monitoring to determine compliance with conditions in this certification;
 - on-site inspections;
 - development, submission, and implementation of monitoring plans;
 - analysis, preparation, and submittal of reports summarizing monitoring results;
 - notifying appropriate authorities in a timely manner when deviations from conditions in this certification occur; and
 - uploading monitoring data into the NHDES Environmental Database (EMD) so that is readily accessible to the public and useable by NHDES for surface water quality assessments required by section 305(b) and 303(d) of the federal Clean Water Act.

Potential Environmental Impacts of Hydroelectric Projects

- D-13. The following description of potential environmental impacts of hydroelectric projects is from a summary report of the 2010 summit meeting on Environmental Mitigation Technology for Hydropower.¹⁸ “Although hydroelectric power plants have many advantages over other energy sources, they also have potential environmental impacts (Table 1). Most of the adverse impacts of dams are caused by habitat alterations. Reservoirs associated with large dams can inundate large areas of terrestrial and river habitat. Diverting water from the stream channel or curtailing reservoir releases in order to store water for future electrical generation can dry out streamside (riparian) vegetation. Insufficient water releases degrade habitat for fish and other aquatic organisms in the river below the dam. Water in a reservoir is stagnant compared to that in a free-flowing river. Consequently, water-borne sediments and nutrients can be trapped, resulting in the undesirable proliferation of algae and aquatic weeds (eutrophication) and a change in water quality in the reservoir and in reservoir releases. In some cases, water spilled from high dams may become supersaturated with nitrogen gas resulting in gas-bubble disease in aquatic organisms inhabiting the tailwaters. Hydropower projects can also affect aquatic organisms directly. The dam can block upstream movements of fish, which can have severe consequences for anadromous fish (e.g., salmon, steelhead, American shad), catadromous fish (e.g., American eels), or riverine fish that make seasonal migrations to spawn (e.g., sturgeon and paddlefish). Fish moving downstream may be drawn into the power plant intake flow (entrained). Entrained fish are exposed to physical stresses (pressure changes, shear, turbulence, strike) as they pass through the turbine that may cause disorientation, physiological stress, injury, or mortality.”

Potentially Affected Surface Waters and Surface Water Quality Standards

¹⁸ Environmental Mitigation Technology for Hydropower: Summary Report on Summit Meeting Convened by Oak Ridge National Laboratory, the National Hydropower Association, and the Hydropower Research Foundation. Washington, D.C. June 2-3, 2010. [EMTSSummit4.pdf \(hydro.org\)](#)

D-14. NHDES has assigned Assessment Unit (AU) identification numbers to many but not all surface water waters in New Hampshire, with many surface waters divided into smaller segments based on their characteristics. AUs (where available) for surface waters located immediately upstream and downstream of the Project are shown in the table below. Because these surface waters are located closest to the Project and within the boundary of the Project, the designated uses (e.g., aquatic life integrity) in these surface waters have the most potential to be impacted by the Project. It is possible, however, that other surface waters may also be affected by the Project (e.g., flow alterations caused by the Project may also affect aquatic habitat in river reaches further downstream, and lack of adequate fish passage can impact fish communities located further upstream and downstream).

Assessment Unit ID	Description
NHRIV600030608-05	Cocheco River – Riverine section upstream of the Project’s impoundment
NHIMP600030608-04	Cocheco River – Project’s impoundment
NHEST600030608-01	Cocheco River - riverine and estuarine segment immediately downstream of Cocheco Falls Dam
	Unnamed wetlands along the riverbanks of each of the assessment units, above.

D-15. Surface Water Quality Standards are summarized in Facts C-9 through C-44 and apply to all New Hampshire surface waters as defined in Fact C-12, including the surface waters identified in Finding D-14 that may be potentially affected by the Project.

D-16. The potentially affected surface waters (see Finding D-14) are classified as Class B (see Fact C-44).

D-17. The goal of Class A and B surface waters is to support the designated uses defined in Env-Wq 1702.17, which include swimming and recreation in and on the water, fish consumption, shellfish consumption (for tidal waters), aquatic life integrity, wildlife, and after adequate treatment as a water supply (see Fact C-18). Designated uses apply “...whether or not such uses are presently occurring” (Env-Wq 1702.17 – see Fact C-18).

D-18. The Cocheco River in the vicinity of the Project is a designated river and is classified as a community river. As such, the Project is within the jurisdiction of the New Hampshire Rivers Management and Protection Program. In accordance with NH RSA 483:9-c and Env-Wq 1900, NHDES must establish protected instream flows (PIFs) and adopt water management plans (WMPs) for each designated river that include details on how to implement the PIFs. To comply with PIFs and Surface Water Quality Standards associated with instream flow, affected water users must comply with the adopted WMPs. NHDES has not yet established PIFs or a WMP for the Cocheco River. If and when NHDES adopts a WMP that establishes PIFs, this certification may need to be modified to specify compliance of the Project with a WMP and PIFs. NHDES does not expect a WMP or PIFs to significantly affect the Project. Condition E-5 addresses this Finding.

D-19. The surface waters in the vicinity of the Project are not Outstanding Resource Waters (see Fact C-40).

D-20. The Cocheco River within the Project boundary is a warmwater fishery. Diadromous fish, including American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), and blueback herring (*Alosa*

aestivalis), Atlantic salmon (*Salmo salar*), American eel (*Anguilla rostrata*), and sea lamprey (*Petromyzon marinus*), historically occurred in the Cocheco River according to USFWS.⁶ In July 2018, a Target Fish Community (TFC) final report for the Cocheco River was prepared for NHDES that reports a fish community that would be expected to exist in the present time given relatively low direct anthropogenic impact on instream habitat. Modelling used to develop the TFC is based on fish community data from the best available reference rivers that would characterize a feasible and currently relevant fish community. The TFC final report for the Cocheco River includes several additional fish species that may exist in the Cocheco River.¹⁹

Rare, Threatened and Endangered Species

D-21. In section 6.0 *Threatened and Endangered Species* of the FLA (see Fact C-71), the Applicant stated the following regarding federal and state rare, threatened, and endangered species that may be found in vicinity of the Project:

“6.1.1 Federal Listed Species

A search of the United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPAC) web site for the project area was conducted, to identify listed threatened or endangered species, under the Federal Endangered Species Act. It listed two Federally listed species. One mammal, the Northern Long-eared Bat (*Myotis septentrionalis*), and one plant, the Small Whorled Pogonia (*Isotria medeoloides*). [...]

The northern long-eared bat roosts in living and dead trees greater than three inches in diameter that have loose or peeling bark, cavities, or crevices. During winter, the northern long-eared bat hibernates in caves and mines. The Project is located within the mapped white-nose syndrome zone for the species. There are no known documented records of northern long-eared bats, roost trees, or hibernacula in the vicinity of the Project. No critical habitat has been designated for this species.

The small whorled pogonia is a member of the orchid family and is widely but sparsely distributed throughout 15 states and Canada. The small whorled pogonia is an herbaceous perennial with five or six leaves arranged in a circle and a single or pair of flowers at the center of the whorled leaves. The small whorled pogonia was listed as an endangered species in 1982 and has since been reclassified as threatened in 1994 due to the criteria of 25 percent of known viable sites receiving permanent protection and substantial improvements in the status being achieved. There are no known documented records of small whorled pogonia in the vicinity of the Project. [...]

6.1.2 State Listed Species

The Licensee contacted [...] New Hampshire Heritage Bureau (NHHB), for a NHB Data check of rare and endangered species. The NHHB report listed One Community, Low Brackish riverbank marsh, three plant species, eastern grasswort (*Lilaeopsis chinensis*), Engelmann’s Quillwort (*Isoetes engelmannii*), and seaside brookweed (*samolus valerandi* ssp. *Parviflorus*), as state endangered, five vertebrate species, American eel (*Anguilla rostrata*), cliff swallow (*Petrochelidon pyrrhonota*), New England cottontail (*Sylvilagus transitionalis*), Northern black racer (*Coluber constrictor constrictor*), and the spotted turtle (*Clemmys guttata*).

¹⁹ Gomez and Sullivan Engineers. 2018. Cocheco River – Final Report. New Hampshire Statewide Target Fish Community Assessment. Prepared for the New Hampshire Department of Environmental Services. [New Hampshire Statewide Target Fish Community Assessment: Cocheco River Final Report \(nh.gov\)](https://www.nh.gov/Portals/0/TargetFishCommunityAssessment/CochecoRiverFinalReport.pdf)

The Natural Community and the plant species all occur in the tidal portion of the Cocheco River, far downstream of the Project. Of the five vertebrate species, the American eel has been observed in the project. New England cottontail is listed as endangered in NH and has been given the status 'critically imperiled due to rarity or vulnerability,' but has not been listed federally. There are two reports of New England cottontail near the Project area in Rollinsford, one in 2013 and one in 2014; both reports were made based on pellets collected from one individual. The Licensee is not aware of the presence of northern black racer or spotted turtle in the project vicinity. [...]

6.2 Project Impacts on Threatened and Endangered Species

While American eel is present both above and below the Project dam, the dam undoubtedly slows the migration of those eels that do pass upstream and likely prevents passage of others. Project impacts to the other state listed species is unlikely under current project operations."

D-22. In USFWS' letter that it filed with FERC on October 8, 2021 (see Fact C-72), USFWS provided the following recommendations pursuant to Section 10(j) of the FPA:

"8. To avoid adverse effects on the northern long-eared bat [NLEB], [USFWS] recommends the Licensee implement a time-of-year restriction of April 1 to October 31 for tree clearing activities associated with the operation or maintenance of the Cocheco Falls Project. This time-of-year restriction does not apply under public safety or other emergencies. In those instances, the Licensee shall notify [USFWS] within two business days of the unplanned safety/emergency action and provide details of the action and response. If planned tree removal activities must occur during the active season, the Licensee should first conduct protocol-level surveys to determine whether the species is present. If the species is present, or if the Licensee chooses to assume presence of the NLEB, the Licensee and/or FERC must consult with [USFWS] under section 7 of the Endangered Species Act before undertaking any activity that may affect the species.

9. To further ensure the protection of current and future federally listed species, the Licensee must notify [USFWS] and [FERC] prior to conducting any activity that may affect a federally listed species in a manner not previously considered in the license. The Licensee should provide notification and request for approval at least 60 days prior to the subject activity."

In NHFGD's letter that it filed with FERC on October 12, 2021 for the Project, NHFGD provided the following comments, among other comments (see Fact C-74):

"Without any reservations, the NHFGD supports and concurs with the observations and all recommendations outlined in the [USFWS] letter dated October 7, 2021 (Accession # 20211008-5054) [...]"

NHDES concurs with the USFWS' Section 10(j) recommendations for the northern long-eared bat and other current and future federally listed species because it will help to minimize impacts of the Project to those species.

D-23. Conditions E-11 through E-17 of this certification are expected to provide reasonable assurance that aquatic species, including, but not limited to, federal and state rare, threatened and endangered species will be protected.

D-24. *Current surface water quality assessment:* According to the 2020/2022 303(d) list of impaired waters (see Fact C-67), the following surface waters in the vicinity of the proposed Project are listed as impaired. All impairments, with the exception of those highlighted in bold (which have approved TMDLs) and “Non-native Aquatic Plants,” are on the 2020/2022 303(d) list. It should be noted that the 2020/2022 303(d) list did not account for water quality monitoring conducted in 2019 for the Project (see Findings D-25 through D-31) because NHDES had not yet inputted the Project data that the Applicant submitted to NHDES into the NHDES Environmental Monitoring Database (EMD) when NHDES completed the assessment for the list.

Assessment Unit (AU)	Waterbody Name	Cause of Impairment (Designated Use Impaired)
NHRIV600030608-05	Cocheco River – Riverine section upstream of the Project’s impoundment	pH (AL) Mercury (FC) Escherichia coli (PCR)
NHIMP600030608-04	Cocheco River – Project’s impoundment	pH (AL) Mercury (FC)
NHEST600030608-01	Cocheco River - riverine and estuarine segment immediately downstream of Cocheco Falls Dam	2-Methylnaphthalene (AL)* Acenaphthene (AL)* Acenaphthylene (AL)* Anthracene (AL)* Benzo(a)pyrene (PAHs) (AL)* Benzo[a]anthracene (AL)* Benzo[g,h,i]perylene (AL)* Chlorophyll-a (AL; PCR) Chrysene (C1-C4) (AL)* DDD (AL)* DDE (AL)* DDT (AL)* Dibenz[a,h]anthracene (AL)* Dieldrin (AL)* Enterococcus (PCR; SCR) Fecal Coliform (SCR) Fluoranthene (AL)* Fluorene (AL)* Indeno[1,2,3-cd] pyrene (AL)* Naphthalene (AL)* Total Nitrogen (AL; PCR) Oxygen, Dissolved (AL) Phenanthrene (AL)* Pyrene (AL)* Mercury (FC; SFC) PCBS (FC; SFC)* Dioxin (SFC)*

Notes: AL = Aquatic Life, PCR = Primary Recreation, SCR = Secondary Recreation, FC = Fish Consumption, SFC = Shellfish Consumption Impairments highlighted in bold have approved TMDLs. All other impairments are on the Section 303(d) List. All fresh surface waters are impaired mercury due to elevated levels of mercury in fish tissue which has resulted in statewide fish consumption advisory.

*These causes of impairment were determined by concentrations in sediment that exceed the Threshold Effect Concentration or Probable Effect Concentration and Benthic Index of Biological Integrity determined during sampling downstream of the Project boundary prior to 2010.

When a surface water does not meet Surface Water Quality Standards (i.e., when it is impaired), the addition of pollutants causing or contributing to impairment should be avoided (see Fact C-70). As noted in the table above, all fresh surface waters in New Hampshire are impaired for mercury due to concentrations found in fish tissue which have resulted in a statewide fish consumption advisory. On December 20, 2007, EPA approved the Northeast Regional Mercury TMDL which addressed mercury impairments in all New Hampshire fresh surface waters, which included the riverine section upstream of the Project's impoundment and the Project's impoundment (see Fact C-68). The primary source of mercury addressed in the TMDL is atmospheric deposition from in-state and out-of-state emissions. Atmospheric deposition from in-state and out-of-state emissions of fossil fuel byproducts can also cause low pH in rain (i.e., acid rain) which can contribute to pH violations in surface waters. Other pollutant sources can also impact mercury concentrations and pH in surface waters. For example, violations of pH Surface Water Quality Standards (see Fact C-35) can also be caused by excessive algal and/or macrophyte plant growth which can lead to increases in pH due to the uptake of carbon dioxide during photosynthesis and reductions in pH at night due to respiration and the release of carbon dioxide. On September 21, 2010, EPA approved the Statewide Bacteria TMDL for 394 surface waters, which included the riverine section upstream of the Project's impoundment, the Project's impoundment, and the riverine and estuarine segment immediately downstream of the Project's dam (see Fact C-69). Sources of bacteria can be natural (e.g., waterfowl, wildlife) and non-natural (e.g., from anthropogenic sources such as stormwater runoff from agricultural and urbanized land uses).

- D-25. From August 5, 2019 to September 9, 2019, the Applicant conducted a water quality study that was requested by NHDES. The goals of the study were to 1) determine if the Project is impacting water quality in the Cocheco River upstream and downstream of the Project dam, and 2) to determine compliance with New Hampshire Surface Water Quality Standards. The objectives of the study were to 1) collect water temperature, dissolved oxygen, and pH in the Project impoundment as well as chlorophyll-a, nutrients, vertical temperature and dissolved oxygen profiles, and Secchi disk data, and 2) collect continuous water temperature and dissolved oxygen upstream of the Project impoundment and downstream of the Project dam. All objectives were to be conducted under various river flow, river temperature, and Project operation conditions that included, but was not limited to, low flow and relatively high-water temperatures.

On March 2, 2021, NHDES filed a letter with FERC that provided, among other things, comments on the Water Quality Study report that the Applicant provided in the FLA for the Project, and requested that the Applicant obtain and provide additional information in the FLA, including results of additional water quality monitoring of surface waters affected by the Project.²⁰ On April 1, 2021, the Applicant filed a letter with FERC to respond to NHDES' comments.²¹ On June 14, 2021, FERC sent a letter to NHDES to, among other things, inform USFWS that FERC would not require the Applicant to conduct additional

²⁰ FERC Document Accession No. 20210302-5016

²¹ FERC Document Accession No. 20210401-5323

water quality monitoring as requested by NHDES.²²

The Applicant included a copy of the Project's Water Quality Study Report in section 7 of Appendix B of the FLA (see Fact C-71).

- D-26. Flow statistics of inflow to the Project based on data from December 2, 2002 through July 9, 2019 were provided in the FLA (see Fact C-71) and were estimated by linearly prorating the sum of drainage areas of U.S. Geological Survey (USGS) Gage 010728000, *Cocheco River near Rochester, New Hampshire* (USGS Gage 010728000), and USGS Gage 01072870, *Isinglass River at Rochester Neck Road near Dover, New Hampshire* (USGS Gage 01072870), by the drainage area of the Cocheco River at the dam of the Project.²³
- D-27. During the water quality study that NHDES requested (see Fact D-25), the Applicant reported that "[r]iver flows during the water quality study generally hovered around 50 cfs for the first two weeks of the study followed by some localized heavy rain (1 to 3 inches precipitation) August 20 – 24 and again on August 29 – 30." To put this in perspective with regards to low flow, 50 cfs flow to the Project occurs approximately 85 percent of the time on annual basis, and approximately 50 percent and 40 percent of the time on a monthly basis based on flow statistics provided in the FLA (see Fact D-26). The Applicant provided calculated flow at the Project dam during the water quality study in Figure 7.2 of the water quality study report included in the FLA (see Fact C-71). Figure 7.2 showed that that minimum and maximum inflow to the Project was approximately 30 cfs and 280 cfs, respectively, and the inflow did not go above 300 cfs, which is the maximum hydraulic capacity of the Project. On December 11, 2020, the Applicant provided NHDES with spreadsheets of temperature and dissolved oxygen data collected at 15-minute intervals during the 2019 water quality study.
- D-28. Water quality monitoring of temperature and dissolved oxygen was conducted in the upstream portion of the impoundment near the Whittier Street Bridge in Dover, NH (Location 3); at the deep spot in the impoundment near the Central Street Bridge in Dover, NH (Location 2-DS); at the downstream end of a trashrack of the Project (Location 2-L); and below Cocheco Dam Falls tailrace/spillway and above the Washington Street Bridge in Dover, NH (Location 1). The Applicant provided the following summary of the monitoring results, among other summaries, in the water quality study report included in the FLA (see Fact C-71):

"While there were many patterns of variability in the data from the three Cocheco Falls DO [dissolved oxygen] logger stations, aside from two short term anomalies at Station 1, all DO readings at all three Cocheco Falls sampling locations were above 5 mg/L. On August 8, there were three consecutive 15-minute readings below 5 mg/L and on August 20 there were six consecutive 15-minute readings below 5 mg/L at Station 1. These two events were sharp departures from higher readings in the 6.5 to 8.1 mg/L range both before and after, and therefore of questionable origin. [...] At no time did the average daily DO saturation levels drop below 75% at any of the three Cocheco Falls stations."

Because only nine 15-minute interval measurements of dissolved oxygen concentration at Location 1 (i.e., Station 1) out of several thousand were below 5 mg/L during the 2019 water quality study, NHDES

²² FERC Document Accession No. 20210614-3007

²³ According to the FLA, prorated flow to the Project were determined by multiplying the daily average flows measured at USGS Gage 010728000 and USGS Gage 01072870 by the ratio of the drainage area of the Cocheco River at the dam of the Project and the drainage area of those USGS gages, which was 167 square miles: 153.5 square miles, or approximately 1.09 (i.e., 167/153.5) according to the FLA.

determined that those nine measurements are unrepresentative of dissolved oxygen conditions at that monitoring location during the 2019 water quality study.

- D-29. Continuous water temperature measurements collected during the water quality study are summarized in the table below.²⁴ As indicated in the table, the study captured periods of relatively high water temperatures, which NHDES considers to be water temperatures of 25 degrees Celsius (°C) or higher. The Applicant provided measured dissolved oxygen and temperature data at the Project dam during the water quality study in Figures 7.3, 7.4, and 7.5 of the water quality study report included in the FLA (see Fact C-71). Based on this temperature data and the flow data the Applicant provided in the FLA, water temperature began to generally decrease with increased flow to the Project, which began on August 20, 2019. Based on the data that the Applicant submitted to NHDES on December 11, 2020 (see Finding D-27), NHDES calculated the following minimum, maximum, and average temperatures and dissolved oxygen concentrations.

Location	Temperature °C		
	Minimum	Maximum	Average
Upstream of Portion of Impoundment (Location or Station 3)	16.5°C	25.8°C	21.6°C
Deep spot in the impoundment (Location or Station 2-DS)	17.6°C	26.8°C	22.2°C
Below Cocheco Dam Falls (Location or Station 1)	18.4°C	25.2°C	22.0°C

Location	Dissolved Oxygen (mg/L)		
	Minimum	Maximum	Average
Upstream of Portion of Impoundment (Location or Station 3)	6.7	9.7	8.5
Deep spot in the impoundment (Location or Station 2-DS)	5.7	9.6	7.8
Below Cocheco Dam Falls (Location or Station 1)	3.7 ²⁵	12.9	7.6

- D-30. A total of 10 water temperature and dissolved oxygen vertical profiles were collected during a 5-week period in the deep spot of the impoundment (Sampling Location 2-S) from August 6, 2019 to September 9, 2019. Nearly all the temperature data that the Applicant provided in Table E-4 of the FLA showed that thermal stratification of the impoundment did not occur during sampling events, but stratification did occur on August 13, 2019 at a depth of 1.0 to 2.0 meters when temperature changed from 23.3 degrees Celsius (°C) to 22.2 °C.²⁶ Dissolved oxygen concentration was greater than 5 mg/L for nearly all the vertical profiles but dropped below 5 mg/L on August 6, 2019 at depths of 3.0 and 4.0 meters. Dissolved oxygen percent saturation was below 75 percent saturation at a depth of 2.0 meters on August 6, 2019, August 13, 2019, August 16, 2019; and at a depth of 3.0 and 4.0 meters on August 6, 2019, August 9, 2019, August 13, 2019, August 16, 2019, and August 20, 2019. NHDES determined that those measurements did not demonstrate violations of Surface Water Quality Standards for dissolved oxygen concentration and percent saturation because Env-Wq 1703.07(d) specifies, among other things, that surface waters within the top 25 percent of depth of thermally unstratified impoundments or

²⁴ NHDES generated the temperature data in the referenced table using data that the Applicant provided in Microsoft Excel format to NHDES on December 11, 2020.

²⁵ The Applicant asserted in the Final License Application that the minimum dissolved oxygen concentration of 3.7 mg/L was part of a short-term anomaly that occurred at the associated monitoring location that was downstream of the dam (see Fact D-28).

²⁶ In NHDES' Sampling Guidance #1 for Hydropower Studies, last revised April 23, 2021, NHDES states that thermal stratification occurs if there is a one degree Celsius or greater change in temperature per one meter or less of depth based on vertical profile temperature measurements beginning at a depth of 0.5 m below the impoundment surface to a depth of 0.5 m above the bottom of the impoundment. Impoundments that are not thermally stratified, are thermally unstratified.

within the epilimnion must be at least 5 mg/L for dissolved oxygen concentration and 75 percent saturation based on a daily average, and dissolved oxygen below those depths must be consistent with that necessary to maintain and protect existing and designated uses. The Applicant provided the following explanation of results in the water quality study report that is included in the FLA (see Fact C-71):

“Following the August 20 rain and rise in river flows the weak stratification was gone and DO and temperature were essentially uniform surface to bottom for the remaining study period.”

- D-31. Ten samples of nutrients and chlorophyll-a were taken twice per week in the deep spot of the impoundment (Sampling Location 2-S) from August 6, 2019 to September 9, 2019, as well as two replicates during that period. Secchi disk readings were also taken on the same days. The Applicant provided the following results in Table E-5 of the water quality study report that is included in the FLA (see Fact C-71). There were no violations of Surface Water Quality Standards for pH for Class B waters (see Fact C-35). There were no excursions of New Hampshire’s numeric chlorophyll-a threshold for recreation for freshwater (15 ug/L) specified in the NHDES CALM⁴ for recreation, indicating a relatively low response to total phosphorous and nitrogen. However, total phosphorous data indicate eutrophic conditions, as described in the CALM, in the impoundment of the Project (see Fact C-34) and the Applicant reported the following occurred during the water quality study: “Floating aquatic vegetation, especially duckweed (*Lemna minor*) became prolific during summer and fall, sometimes completely carpeting the water surface in quiet backwaters and dam forebays.” Therefore, chlorophyll-a concentrations during the study were likely being regulated by the duckweed via shading and nutrient uptake competition.

Date	Secchi Disk (M)	pH	NO3/NO2-N (mg/L)	TKN (mg/L)	TP (mg/L)	Chlorophyll a (ug/L)
8/6/19	1.5	6.96	0.21	<0.5	0.12	3.2
8/9/19	1.6	7.00	<0.5	0.90	0.11	2.9
8/9/19	Replicate	--	<0.5	0.51	0.11	2.9
8/13/19	1.9	7.00	<0.5	<0.5	0.16	<0.5
8/16/19	2.2	7.01	0.19	<0.5	0.13	3.6
8/20/19	1.6	7.00	0.24	<0.5	0.15	5.1
8/23/19	1.7	7.01	0.34	<0.5	0.16	2.5
8/23/19	Replicate	--	0.34	<0.5	0.16	2.1
8/27/19	1.4	7.00	0.26	<0.5	0.11	2.1
8/30/19	1.3	7.00	0.45	<0.5	0.17	2.2
9/3/19	N/A	7.01	0.27	0.56	0.078	3.6
9/9/19	1.4	7.01	0.58	<0.5	0.18	2.5

- D-32. The results of the 2019 water quality study showed one instance of thermal stratification in the impoundment of the Project and relatively high water temperatures during certain times of the study (see Findings D-29 and D-30). The Applicant is currently required to maintain a minimum flow release immediately below the Project dam and into the bypass facilities of 20 cfs for the operation of the NHFGD upstream fish ladder; 20 cfs for upstream fish ladder attraction water from April 15 to June 30; and 20 cfs flow through the fish pipe (i.e., hooded sluiceway) to aid downstream fish migration from June 15 to ice formation (see Finding D-3) .

- D-33. The Project has altered the wetted natural river channel (i.e., the channel is deeper and wider) and

associated discharge characteristics (i.e., slower and more stagnant) which makes the river more prone to adverse water quality impacts (Finding D-13). These alterations, combined with effluent discharges containing nutrients and other pollutants from the upstream sources (e.g., wastewater treatment facilities, , has likely contributed to lower water quality in the Project impoundment when inflow to the Project is relatively low.

- D-34. *Water Quality Improvement Plan (WQIP):* Compared to conditions that existed prior construction of the dam of the Project, the impoundment formed by the dam of the Project has resulted in a deeper, wider, and slower moving section of the river that is more prone to thermal stratification and adverse water quality impacts, such as lower dissolved oxygen and higher water temperatures, than riverine sections that are not impounded. It is possible that if the dam was not there, the average temperature would not be highest at the deep spot of the Project impoundment (i.e., Station 2-DS), and the average dissolved oxygen concentration at the deep spot of the Project impoundment would not have been 0.7 mg/L lower than the upstream portion of the Project impoundment (i.e., Station 3), as demonstrated by the 2019 water quality study (see Fact D-29). This is not to suggest that NHDES is advocating for the dam to be removed, rather it is to make the point that the Project, even when not generating, could still be responsible for causing adverse changes in river water quality. Conditions of this certification help ensure that any degradation of surface waters caused by discharges from the Project are minimized and will protect existing and designated uses in accordance Env-Wq 1703.01 (see Fact C-25).

According to Env-Wq 1703.01(b), “[a]ll surface waters shall be restored to meet the water quality criteria for their designated classification including existing and designated uses, and to maintain the chemical, physical, and biological integrity of surface waters” (see Fact C-25). Results of the water quality study conducted by the Applicant in 2019 showed that the Project has not impaired certain parameters of existing and designated uses. However, to address any violations of Surface Water Quality Standards that may arise in the future at a magnitude, duration, and frequency that contributes to an impaired designated use in the Project influenced waters, it would be necessary to require the Applicant to prepare and implement a WQIP (see Fact C-18). The purpose of a WQIP would be to restore surface waters to meet Surface Water Quality Standards in accordance with Env-Wq 1703.01(b) for parameters that are influenced by the Project. If the riverine segment immediately upstream and beyond the influence of the Project impoundment is not meeting Surface Water Quality Standards, then the purpose of the WQIP would be to restore surface waters so that the parameters of water quality that are influenced by the Project are not any worse than in the upstream riverine segment. Parameters that may be influenced by the Project include, but are not limited to, dissolved oxygen, temperature, pH, nutrients, chlorophyll-a, and secchi disk (i.e., turbidity). A WQIP would include measures to achieve the purpose of the WQIP; a schedule for implementing the measures; water quality monitoring and reporting to determine the effectiveness of the implemented measures; and recommendations for next steps. RSA 485-A:12, III authorizes water quality monitoring (see Fact C-8 and Finding D-12). Condition E-16 addresses this Finding.

- D-35. *Dissolved Oxygen and Temperature Quality Monitoring and Reporting:* Results of the water quality study conducted by the Applicant in 2019 showed one instance of thermal stratification at the deep spot of the impoundment of the Project and that the average dissolved oxygen level was approximately 0.7 mg/L lower at the deep spot of the Project impoundment than the upstream portion of the Project impoundment (see Finding D-29). Results of the water quality study conducted by the Applicant in 2019 generally demonstrated compliance with dissolved oxygen and temperature Surface Water Quality Standards. If a violation of a Surface Water Quality Standard for dissolved oxygen or temperature arises in the future at a magnitude, duration, and frequency that contributes to an impaired designated use, additional monitoring would be necessary during the term of the license. This is because FERC licenses are typically issued for 30 to 50 years and, during that time, conditions in the watershed that could affect

water quality in the Project impoundment and Project discharges to the tailrace and bypass reach, can change. For example, due to climate change “[w]armer summer temperatures will likely lead to an increase in drought (through increased evaporation, heat waves, and more frequent and extreme convective precipitation events).”²⁷ An increase in the frequency and magnitude of lower river flows and higher temperatures could result in an increase in the frequency and magnitude of dissolved oxygen violations and higher water temperatures. If a WQIP becomes necessary because of a violation of a Surface Water Quality Standard for dissolved oxygen or temperature, additional monitoring would be necessary. Condition E-17 addresses this need.

The purpose of the monitoring is to: 1) determine the effects of Project operation, both spatially and temporally (in terms of flow, impoundment elevation and power generation) on water temperature and dissolved oxygen (i.e., dissolved oxygen concentration and dissolved oxygen percent saturation); 2) to compare results to Surface Water Quality Standards; and 3) to determine if additional changes in Project operation or the WQIP are necessary to comply with Surface Water Quality Standards.

In the event that Condition E-16 is triggered by a violation of Surface Water Quality Standards at a magnitude, duration, and frequency that contributes to an impaired designated use related to dissolved oxygen or temperature, Condition E-17 requires inclusion of a specific type of monitoring and reporting plan in a WQIP for NHDES review and approval. This is so the plan can be updated (if necessary) to conform to NHDES’ latest monitoring protocols and/or to any changes in dissolved oxygen or temperature Surface Water Quality Standards. Condition E-17 includes some specifics of what the monitoring and reporting plan shall include, which are very similar to the monitoring and reporting protocols used to by the Applicant to prepare the 2019 water quality study included in the Final License Application (see Fact C-71). This includes submittal of data in a working spreadsheet and input of all data into the NHDES Environmental Monitoring Database (EMD), so the data is accessible to the public and is available for use by NHDES to conduct surface water quality assessments required every two years by the sections 305(b) and 303(d) of the Federal Clean Water Act.

Inclusion of monitoring conditions is authorized by RSA 485-A:12, III (see Fact C-8) which states the following: “Certification shall include any conditions on, modifications to, or monitoring of the proposed activity necessary to provide assurance that the proposed discharge complies with applicable surface water quality standards” (see Fact C-8 and Finding D-12).

Flow / Impoundment Management

D-36. *Applicant’s Proposal:* As discussed in Findings D-5 and D-6, the Applicant proposes to 1) continue to operate the Project in a run-of-river mode, where inflow approximately matches outflow; 2) continue to facilitate upstream and downstream fish passage in cooperation with NHFGD by passing a flow of 20 cfs from the upstream fish passage facility April 15 until June 30; an attraction flow of 20 cfs at the spillway from April 15 until June 15; and a flow of 20 cfs through the fish pipe (i.e., hooded sluiceway) to aid downstream fish migration from April 15 to ice formation on the river; 3) design and install upstream eel passage at the right bank Denil location within 4 years of the effective date of the renewed license in consultation and cooperation with state and federal resource agencies; and 4) when flashboards fail, they will be repaired as soon as river flow, worker safety, and Project operations permit.

²⁷ Wake, Cameron P.; Burakowski, Elizabeth A.; Wilkinson, Peter; Hayhoe, Katharine; Stoner, Anne; Keeley, C.; and LaBranche, Julie, "Climate Change in Southern New Hampshire: Past, Present and Future" (2014). The Sustainability Institute. 2. <https://scholars.unh.edu/sustainability/>

D-37. *Run-of-River and Bypass Facility Flows:* The Project includes a bypass reach that is approximately 100 feet long and extends between the dam and tailrace. Under the current FERC license, the Applicant is required to to operate the Project in run-of-river mode and release the following minimum flows to the bypass facility: 20 cfs through the fish ladder for operation of the fish ladder from April 15 to June 30; 20 cfs at the spillway (i.e., the trash sluiceway) to attract fish to the fish ladder from April 15 to June 15; and 20 cfs through the downstream fish passage pipe to aid downstream fish migration from June 15 until ice forms (see Finding D-4). Flow affects the quality and quantity of aquatic habitat, and directly impacts aquatic biota (e.g., movement, stranding, spawning and tributary access).

In the FLA The Applicant proposed releasing 20 cfs through the fish ladder, 20 cfs through the spillway for fish ladder attraction flow (i.e., trash sluiceway or dam slot), and 20 cfs through the downstream fish passage pipe from April 15 to June 30; and 20 cfs through the downstream fish passage pipe from July 1 to December 31 (see Findings D-5 and D-6).

In USFWS’ letter that it filed with FERC on October 8, 2021 (see Fact C-72), USFWS provided the following recommendations pursuant to Section 10(j) of the FPA:

“1. To protect the fluvial geomorphic processes within the Cocheco River, and support aquatic habitats and the species that reside there, the Licensee should operate the Project in a run-of-river mode where outflow approximates inflow as provided for in Table 1, 2, and 3, above. These project operations may be temporarily modified if required by operating emergencies beyond the control of the Licensee, or for short periods upon mutual agreement between the Licensee, [USFWS], [NMFS], [NHFGD], and [NHDES].”

Tables 1, 2, and 3 that the USFWS referenced in that recommendation are copied, below:

Table 1. Proposed Normal Project Operation (January 1 – April 14)

River Flow (cfs)	Proposed Project Operation
0-100	<ul style="list-style-type: none"> • Unit One operating within 2 inches of flashboard top
101-200	<ul style="list-style-type: none"> • 100 cfs through Unit One and operating continuously; • Unit Two operating within 1 inch of top of flashboards.
201-300	<ul style="list-style-type: none"> • 200 cfs through Units one and two and operating continuously; and • Unit Three operating within ½ inch of top of flashboards.
> 300 cfs	<ul style="list-style-type: none"> • 300 cfs through Units one, two, and three and operating continuously; • flow in excess of 300 cfs spilled at dam.

Table 2. Proposed Project Operation during the Upstream and Downstream Fish Passage Season (April 15 – June 30).

River Flow (cfs)	Proposed Project Operation
0-60	<ul style="list-style-type: none"> • 20 cfs to the fish ladder; • 20 cfs through sluice way for fish ladder attraction flow; and • 20 cfs through downstream fish passage pipe
60-160	<ul style="list-style-type: none"> • 20 cfs to the fish ladder; • 20 cfs through sluice way for fish ladder attraction flow; • 20 cfs through downstream fish passage pipe; and • Unit One operating within 2 inches of top of flashboards.
161-260	<ul style="list-style-type: none"> • 20 cfs through downstream fish ladder; • 20 cfs through dam slot for fish ladder attraction flow; • 20 cfs through downstream fish passage pipe; • 100 cfs through Unit One operating continuously; and • Unit Two operating within 1 inch of top of flashboards.
261-360	<ul style="list-style-type: none"> • 20 cfs through downstream fish ladder; • 20 cfs through dam slot for fish ladder attraction flow; • 20 cfs through downstream fish passage pipe; • 200 cfs through Units one and two, operating continuously; and • Unit Three operating within ½ inch of top of flashboards.
> 361	<ul style="list-style-type: none"> • 20 cfs through downstream fish ladder; • 20 cfs through dam slot for fish ladder attraction flow; • 20 cfs through downstream fish passage pipe; • 300 cfs through Units one, two, and three operating continuously; and • flow in excess of 360 cfs spilled at dam.

Table 3. Proposed Project Operation during the Downstream Fish Passage Only Season (July 15 – December 31).

River Flow (cfs)	Proposed Project Operation
0-20	<ul style="list-style-type: none"> • 20 cfs through downstream fish passage pipe;
21-120	<ul style="list-style-type: none"> • 20 cfs through downstream fish passage pipe; and • Unit One operating within 2 inches of top of flashboards.
121-220	<ul style="list-style-type: none"> • 20 cfs through downstream fish passage pipe; • 100 cfs through Unit One operating continuously; and • Unit Two operating within 1 inch of top of flashboards.
221-320	<ul style="list-style-type: none"> • 20 cfs through downstream fish passage pipe; • 200 cfs through Units one and two operating continuously; and • Unit Three operating within 1 inch of top of flashboards.
> 320	<ul style="list-style-type: none"> • 20 cfs through downstream fish passage pipe; • 300 cfs through Units one, two, and three operating continuously; and • flow in excess of 320 cfs spilled at dam.

In NHFGD’s letter that it filed with FERC on October 12, 2021 for the Project, NHFGD provided the following comments, among other comments (see Fact C-74):

“Without any reservations, the NHFGD supports and concurs with the observations and all recommendations outlined in the [USFWS] letter dated October 7, 2021 (Accession # 20211008-5054) [...]”

NHDES concurs with the USFWS’ Section 10(j) recommendation to operate the Project in a run-of-river mode whereby outflow (i.e., discharges) approximates inflow as provided for in USFWS’ Tables 1, 2, and 3, above, except during emergencies beyond the control of the Applicant and for short periods upon mutual agreement with the resource agencies. Operating in this manner will minimize impoundment fluctuations and maintain a more natural flow regime downstream of the tailrace, which will protect habitat for a variety of aquatic and riparian species and help ensure compliance with Surface Water Quality Standards including, but not limited to, “Biological and Aquatic Community Integrity” (Env-Wq 1703.19 – see Fact C-36) and Env-Wq 1703.01(d) regarding maintaining surface water quantity (e.g., flow) at levels that protect existing uses and designated uses (see Fact C-25). Conditions E-12.a and E-12.b address this Finding.

D-38. *Impoundment Water Level:* When the Project is generating and inflow is within the hydraulic operating range of the turbines plus the required minimum bypass flows (see Finding D-4), the Applicant currently

maintains a relatively stable impoundment by keeping the impoundment near the top of the flashboards at an elevation 36.25 feet NGVD 29. The Applicant stated that impoundment water level would be either within ½ inch, 1 inch, or 2 inches of the top of the flashboards of the Project dam depending on the number of turbines operating. This is accomplished via an automatic pond level control system to regulate turbine operation, such that outflow from the Project approximates inflow, based on a water level transducer. In a memo that FERC filed on April 20, 2022, FERC summarized conversation with a representative of the Applicant on April 19, 2022 and reported that the Applicant proposed “[...] to reduce drawdowns to no more than 1-inch below the top of flashboards. [The representative] stated that the pond level controller is precise enough to maintain this drawdown.”²⁸ According to a letter that the Applicant filed with FERC on April 26, 2022, the Applicant has historically attempted to keep the impoundment fluctuation within 2 inches of the top of flashboards of the Project but could not “stipulate on frequency of impoundment fluctuations, because I do not have any way of recording that information. It all depends upon river flows”.²⁹ Flashboard failure can also cause impoundment fluctuations.

NHDES concurs with the applicant that it should minimize the frequency and magnitude of fluctuations in the impoundment by controlling discharges at the Project as much as possible because it will help protect the flora and fauna in the littoral and riparian zones of the impoundment and help to assure compliance with Surface Water Quality Standards including, but not limited to, “Biological and Aquatic Community Integrity” (Env-Wq 1703.19 – see Fact C-36 and Finding D-40). Condition E-12.c addresses this Finding.

D-39. *Impoundment Refill Procedures:* Following authorized drawdowns, a refill procedure is necessary to ensure adequate flow (i.e., discharge) from the Project is maintained downstream of the Project dam and adequate flow is available to refill the impoundment at an appropriate rate to protect aquatic habitat and aquatic life. In USFWS’ letter that it filed with FERC on October 8, 2021 (see Fact C-72), USFWS provided the following recommendations pursuant to Section 10(j) of the FPA:

“2. To protect aquatic resources of the Cocheco River downstream of the Project, the Licensee should implement a reservoir refill protocol whereby, following a reservoir drawdown, whether in support of power generation, planned or unplanned maintenance activities, or in response to conditions beyond the Licensee’s control, 90 percent of inflow is passed downstream of the Project’s tailrace and the reservoir is refilled on the remaining 10 percent of inflow. This refill protocol may be modified on a case-by-case basis with the prior approval of [USFWS], [NHFGD], and [NHDES].”

In FERC’s environmental assessment for the Project that FERC filed on September 21, 2022, FERC provided the following recommendation and analysis regarding the Project’s impoundment refill procedures:

“To protect aquatic resources in the impoundment, implement an impoundment refill procedure following emergency and maintenance drawdowns, whereby 100% of inflow is used to refill the impoundment. [...]

The procedures that are used to draw down and refill an impoundment following drawdowns for maintenance and emergencies, such as the 2-foot drawdowns associated with flashboard replacement, can significantly affect aquatic habitat and organisms in the impoundment.

²⁸ FERC Document Accession No. 20220420-3057

²⁹ FERC Document Accession No. 20220426-5148

Impoundment refill procedures are an attempt to balance aquatic habitat effects within the impoundment and habitat effects in the bypassed reach and the river downstream of the project. Effects within the impoundment can include temporary dewatering of nearshore habitat for fish, mussels, and other aquatic organisms. Releasing all flows to the downstream reach would provide aquatic habitat for fish and other aquatic organisms in the downstream reach, but would adversely affect aquatic life in the impoundment by sustaining the dewatered conditions. Conversely, retaining all inflows to refill the impoundment would minimize the effects of the drawdown in the impoundment, but eliminates downstream flow releases until the impoundment is refilled.

[...T]he upper section of the bypassed reach is dominated by ledge outcrops and provides negligible aquatic habitat, and the lower section is inundated at all times by the tidal flow from the Cocheco River. Additionally, portions of the upper section of the bypassed reach receive flows from the debris sluice gate, Denil fish ladder, or the downstream fish passage facility except from January 1 through April 14, when any pool habitat in the upper section of the bypassed reach would likely be frozen. Therefore, retaining all inflows to refill the impoundment would minimize the effects of the drawdown in the impoundment and would not likely significantly affect aquatic organisms in the bypassed reach and downstream of the tailrace. At an inflow of 54 cfs (the median August flow), using all of the inflow to refill the impoundment would result in a refill time of about 15 hours.

Based on the specific conditions downstream of the dam (including the lack of habitat in the upper bypassed reach and the constant inundation of the lower bypassed reach by tidal flows), [USFWS's] recommendation to release 90% of the impoundment's inflow during impoundment refilling would not likely substantively benefit aquatic organisms in the bypassed reach and downstream of the tailrace. Instead, [USFWS's] recommendation would result in slower impoundment refill times that could adversely affect aquatic organisms in the impoundment relative to a procedure whereby all inflows are retained to refill the impoundment. At an inflow of 54 cfs (the median August flow), [USFWS's] recommended refill procedure would take approximately 147 hours or 6 days to refill the impoundment two feet (66 acre-feet or 2,874,955 cubic feet) after replacement of the flashboards.

[USFWS's] recommended 90/10 refill procedure would apply to refills following drawdowns that are "in support of power generation." Under the proposed operation, CFA would draw down the impoundment as much as 1 inch, from 36.25 to 36.17 feet NGVD 29 to support electricity generation. [USFWS's] recommendation would require that as the impoundment is refilled from 1 inch below the top of the flashboards to the top of the flashboards, CFA would release 90% of the impoundment inflow to the bypassed reach.

[...D]rawdowns of 1 inch are within the range of fluctuations observed in natural, unregulated lakes due to wind and wave action. Therefore, implementing [USFWS's] impoundment refill procedure in response to these minor drawdowns caused by power generation would have no measurable benefit to aquatic resources within the impoundment. Within the bypassed reach and the river downstream of the tailrace, the benefits would be minimal, due to the limited aquatic habitat in the upper section of the bypassed reach and the overwhelming backwatering effect of the tidal river from the base of the falls and continuing downstream."

On October 3, 2022, NHFGD informed NHDES that the Project presents a unique situation where a refill rate as recommended by FERC would probably be more beneficial to the biota upstream than detrimental to the biota downstream of the Project, but minimum bypass facility flows should be maintained during refill.³⁰ NHDES concurs with the impoundment refill procedures described by NHFGD

³⁰ October 3, 2022 emails between NHDES and NHFGD regarding the Project's refill procedures.

to the extent possible based on physical limitations of bypass facility structures, because the procedures will help to minimize dramatic and sudden reductions in bypass facility flows, which can adversely impact habitat and aquatic life, while still providing sufficient flow to refill the pond to the normal elevation.

These measures will help to maintain sufficient habitat for aquatic life and help to assure compliance with Surface Water Quality Standards, including, but not limited to, “Biological and Aquatic Community Integrity” (Env-Wq 1703.19 – see Fact C-36) and Env-Wq 1703.01(d) regarding maintaining surface water quantity at levels that protect existing uses and designated uses (see Fact C-25). Condition E-12.d addresses this Finding.

- D-40. *Impoundment Drawdown Rate During Scheduled Maintenance; Flashboard Failure:* The NHFGD recommends controlling Project discharges when drawing the impoundment down for maintenance so that the impoundment level decreases by no more than approximately six (6) inches per 24-hour period. This is done to allow adequate time for the less mobile aquatic organisms (including, but not limited to mussels), to move and stay sufficiently submerged as the water level gradually recedes.

In the FLA, the Applicant summarizes the results of a mussel survey of the impoundment of the Project that was conducted on September 4, 2019 and provides a copy of the report of the survey in section 7 of Appendix B of the FLA. (see Fact C-71). The survey area focused on areas of less than 3 feet of depth in the Project’s impoundment. Results of the survey showed that the following species of mussels were found in the impoundment of Project: eastern elliptio (*Elliptio complanata*); eastern floater (*Pyganodon cataracta*); and alewife floater (*Anodonta implicata*). NHFGD has designated alewife floater as a Species of Species of Greatest Conservation Need (SGCN).

In USFWS’ letter that it filed with FERC on October 8, 2021 (see Fact C-72), USFWS provided the following recommendations pursuant to Section 10(j) of the FPA:

“10. To protect mussel species, including the SGCN alewife floater, from Project impacts associated with reservoir drawdowns due to flashboard failure or required maintenance drawdowns, the Licensee should develop a mussel protection plan in consultation with [USFWS], NHFGD, and [NHDES]. The plan should articulate measures to be implemented to protect and limit the effect of Project operations during any drawdown, including routine maintenance or flashboard outage events.”

In NHFGD’s letter that it filed with FERC on October 12, 2021 for the Project, NHFGD provided the following comments, among other comments (see Fact C-74):

“Without any reservations, the NHFGD supports and concurs with the observations and all recommendations outlined in the [USFWS] letter dated October 7, 2021 (Accession # 20211008-5054) [...]”

NHDES concurs with the recommendations of USFWS. NHDES also recommends that the Applicant be provided the opportunity to modify these maintenance-related impoundment drawdown procedures on a case-by-case basis with prior approval from NHFGD.

These measures will help to maintain sufficient habitat for aquatic life and help to assure compliance with Surface Water Quality Standards, including, but not limited to, “Biological and Aquatic Community Integrity” (Env-Wq 1703.19 – see Fact C-36) and Env-Wq 1703.01(d) regarding maintaining surface water

quantity at levels that protect existing uses and designated uses (see Fact C-25). Conditions E-12.e and E-14.i address this Finding.

- D-41. *Flow and Impoundment Compliance Monitoring Plan:* In USFWS' letter that it filed with FERC on October 8, 2021 (see Fact C-72), USFWS provided the following recommendations pursuant to Section 10(j) of the FPA:

"3. To monitor compliance with the operational requirements of the license and facilitate resource agency oversight and protection of the Project affected resources, the Licensee, within 6 months of License issuance, should prepare and file for approval by [USFWS], [NHFGD], and [NHDES], a Project Operation Compliance Monitoring and Reporting Plan to monitor compliance with the project operations specified in Recommendation 1 (see USFWS's recommendation under Finding D-37). The plan should detail the methods for recording data on the project operations specified in Recommendation 1 and provide for (1) real-time, web-based reporting of reservoir water surface elevations, power generation and Unit operations, and fish passage flows and operation; (2) archiving data for inspection by [USFWS, [NMFS], [NHFGD], and [NHDES]; and (3) filing annual compliance monitoring and event-specific non-compliance reports with [FERC]."

In NHFGD's letter that it filed with FERC on October 12, 2021 for the Project, NHFGD provided the following comments, among other comments (see Fact C-74):

"Without any reservations, the NHFGD supports and concurs with the observations and all recommendations outlined in the [USFWS] letter dated October 7, 2021 (Accession # 20211008-5054) [...]"

NHDES concurs with USFWS' recommendation. The development and implementation of a plan describing how flow and impoundment water level will be managed, monitored, and reported (as allowed by RSA 485-A:12, III – see Finding D-12) will monitor compliance with the operational requirements of the license and this certification, and facilitate NHDES' oversight and protection of surface waters affected by the Project to ensure compliance with Surface Water Quality Standards (RSA 485-A:8 and Env-Wq 1700 – see Finding D-15). Condition E-14 addresses this Finding.

Water Use Registration and Reporting

- D-42. *Water Use Registration and Reporting:* The Project is currently registered with the NHDES WURRP and has been reporting water use of the Project to the NHDES WURRP since 1992 (see Facts C-55 through C-59). The Applicant must continue to report under this water use in accordance with Env-Wq 2102 (see Facts C-55 through C-59). The WURRP provides valuable data for tracking discharges (such as those from the Project) to and withdrawal volumes from surface waters and other sources throughout the state. This water quantity data assists NHDES with managing water resources to help assure surface waters have sufficient water to support the designated uses (see Fact C-25) specified in the Surface Water Quality Standards (see Finding D-15). Including a condition in this certification to require compliance with WURRP is authorized under RSA 485-A:12, III (see Finding D-12). Condition E-9 addresses this Finding.

Water Conservation Program

- D-43. *Water Conservation:* The Project is subject to the state's water conservation requirements; however, NHDES granted a waiver to the Applicant for those requirements for a period of 4 years on October 14,

2021. Therefore, by October 14, 2025 and thereafter, the Applicant will be required to comply with the rules for water conservation under Env-Wq 2101.05(f) and Env-Wq 2101.24(a)(5) or apply for and obtain a waiver to those rules under Env-Wq 2101.23 from NHDES.

Coastal Zone Program

D-44. The Project is subject section 307(c)(3)(A) of the CZMA and, therefore, requires the Applicant to submit a CZMA Federal consistency certification to the New Hampshire Coastal Program (See Facts C-65 and C-66). Condition E-11 addresses this Finding.

Fish Passage

D-45. *Fish Species:* The Cocheco River historically supported the following diadromous fish: American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), and blueback herring (*Alosa aestivalis*), Atlantic salmon (*Salmo salar*), American eel (*Anguilla rostrata*), and sea lamprey (*Petromyzon marinus*) (see Finding D-20).

D-46. *Impact of Dams on Fish Migrations:* In USFWS' letter that it filed with FERC on October 8, 2021 (see Fact C-72) USFWS provided the following description of impacts of dams on fish migrations in the Preliminary Prescription for Fishways pursuant to Section 18 of the FPA:

"...Dams can impact both upstream and downstream fish migration in rivers (Limburg and Waldman 2009, p. 961). Dams not only block or impede fish migration, but also alter the rivers' hydrology and aquatic habitat availability. Upstream of dams, where water flow is slowed, lake-like conditions, rather than riverine ones, prevail. Water flow downstream of dams, particularly at peaking hydroelectric projects, can be altered significantly (Limburg and Waldman 2009, p. 961) with dramatic changes in water depth and velocity occurring over short time periods. Depending on the severity and location of blockages and changes to hydrology, migratory fish populations can be severely reduced or extirpated due to dams (Limburg and Waldman 2009, p. 960)."

D-47. *Current Status of Fish Passage Facilities:* A passage at the Project is currently provided by a Denil-type fish ladder located on the south side of the dam of the Project. The fish ladder is owned and maintained by NHFGD. Downstream fish passage at the Project is currently provided by collection box and weir at downstream end of the intake of the Project, which releases water to a 24-inch-diameter PVC fish passage pipe that empties into a plunge pool below the dam of the Project (see Findings D-4).

As described in the FLA, the Applicant conducted a *Downstream River Herring and American Eel Passage Assessment* and an *Upstream Eel Passage Assessment* in 2019 to determine the effectiveness of existing fish passage facilities at the Project (see Fact C-71). In the FLA, the Applicant stated the following:

"While the downstream river herring and eel passage assessment [...] did not provide sufficient data to assess downstream passage effectiveness, there are many reasons to expect that the Cocheco Falls downstream bypass is effective."

In a letter that USFWS filed with FERC on February 24, 2021, USFWS reiterated that the methodologies and schedule the Applicant used in the *Upstream Eel Passage Assessment* was inadequate for various reasons, and requested a new upstream eel passage assessment that followed USFWS' requested study approach.³¹ In a letter that NHFGD filed with FERC on February 25, 2021, NHFGD concurred with USFWS

³¹ FERC Document Accession No. 20210224-5116 (USFWS reiterated from comments USFWS provided to the Applicant on a

regarding the lack of an acceptable methodology and schedule and requested also requested a new upstream eel passage assessment.³² On June 14, 2021, FERC sent a letter to USFWS to, among other things, inform USFWS that FERC would not require the Applicant to conduct a new upstream eel passage assessment as requested by USFWS.²²

D-48. *Proposed Fish Passage Facilities:* The Applicant's proposed fish passage measures are discussed in Finding D-6.

In USFWS' letter that it filed with FERC on October 8, 2021 (see Fact C-72), USFWS provided the following recommendations pursuant to Section 10(j) of the FPA:

"4. To assess the effectiveness of the downstream fish bypass facility in attracting and passing juvenile and adult river herring, and adult American eel, the Licensee should develop a fishway effectiveness monitoring plan within 6 months of license issuance and in consultation with [USFWS], [NMFS], [NHFGE], and [NHDES]. The monitoring plan should determine what, if any, enhancements must be made to the downstream fish bypass facility or other routes of egress (e.g., the Project's debris sluice) to provide safe, timely, and effective downstream passage of target species.

5. To provide safe, timely, and effective upstream fish passage for alosine species, the Licensee should operate and maintain the Denil fish ladder in a manner that supports and complies with the goals, objectives, and directives of [NHFGE] in its management of the anadromous fishery resources of the Cocheco River and the State of New Hampshire.

6. To provide the safe, timely, and effective upstream passage of juvenile American eel, within 4 years of license issuance, the Licensee should design, construct, and operate an upstream eel passage facility at the Project consistent with the requirements specified in [USDI's] Section 18 Fishway Prescription for the Cocheco Falls Project.

6. To provide the safe, timely, and effective upstream passage of juvenile American eel, within 4 years of license issuance, the Licensee should design, construct, and operate an upstream eel passage facility at the Project consistent with the requirements specified in [USDI's] Section 18 Fishway Prescription for the Cocheco Falls Project.

7. To support the safe, timely, and effective upstream passage of juvenile American eel at the Project, the Licensee should develop and implement, in consultation with [USFWS], [NMFS], and [NHFGE], an upstream American eel passage assessment study plan consistent with the [USFWS'] June 22, 2018, study request. The study plan should include provisions for (a) systematic surveys of eel presence and relative abundance conducted at regular intervals throughout the eel upstream migratory season (May 1 to October 31) or when river temperatures exceed 10°C; (b) the use of temporary/portable trap passes to assess areas identified by the systematic surveys; (c) an assessment of the existing Denil upstream fish ladder to provide upstream eel passage; and (d) a report that includes information on the location, trapping interval, absolute numbers of eels trapped, relative eel sizes, and hydraulic and environmental conditions during the survey/trapping period.

Information gathered pursuant to this recommendation will inform the placement of an eelway(s) required by the [USDI's] Section 18 Fishway Prescription and [USFWS's] 10(j) Recommendation 6."

proposed study plan in a document with FERC Document Accession No. 20190614-5115).

³² FERC Document Accession No. 20210225-5167

In NHFGD's letter that it filed with FERC on October 12, 2021 for the Project, NHFGD provided the following comments, among other comments (see Fact C-74):

"[...] the Applicant has agreed that within 4 years of the effective date of any subsequent license, the Licensee will design and install an upstream eel passage facility at a location close to the Denil fish ladder on river right, install and operate an upstream eel ramp and downstream fish passage facility; as well as, implement nightly turbine shutdowns.

In addition, the New Hampshire Wildlife Action Plan has identified the American eel as a Species of Greatest Conservation Need (SGCN) and alewife, blueback herring, and shad as Species of Concern (SC), with the restoration of stream connectivity as an action to conserve each species.

Therefore, [NHFGD] strongly recommends that new fishways be designed, constructed, operated, and maintained for the Project as are necessary to accomplish safe, timely, and effective upstream passage and downstream passage of migratory fish; and such measures be taken as are necessary to ensure the effectiveness of those fishways during the term of the license.

Without any reservations, the NHFGD supports and concurs with the observations and all recommendations outlined in the [USFWS] letter dated October 7, 2021 (Accession # 20211008-5054) including Attachment A, which provides the details of the USFWS preliminary prescription, including procedural instructions. More specifically, the NHFGD supports all the 10(j) Prescription/recommendations identified by the USFWS within the aforementioned letter."

NHDES concurs with the recommendations of USFWS and NHFGD that the Applicant, within 4 years of license issuance, design, construct, and operate an upstream eel passage facility at the Project consistent with the requirements specified in USFWS's Section 18 Fishway Prescription for the Project to provide the safe, timely, and effective upstream passage of juvenile American eel.

D-49. *USFWS Preliminary Prescription for Fishways:* In USFWS' letter that it filed with FERC on October 8, 2021 (see Fact C-72), USFWS included the Preliminary Prescription for Fishways for the Project in accordance with Section 18 of the FPA (see footnote 9). On October 28, 2021, the Applicant filed a letter with FERC to provide comments on the Preliminary Prescription for Fishways.³³ On November 18, 2021, USFWS filed a letter with FERC to respond to those comments and correct and clarify the Preliminary Prescription for Fishways.³⁴ In the Preliminary Prescription for Fishways, USFWS stated that the development of the prescription included consultation among USFWS, NMFS, NHFGD, and NHDES. USFWS also stated the following, among other things, in the Preliminary Prescription for Fishways:

"To allow for the timely implementation of fishways, including effectiveness measures, and pursuant to Section 18 of the Federal Power Act, as amended, the Secretary of [USDI] reserves their authority to prescribe the construction, operation, and/or maintenance of fishways at the [Project], as appropriate, including, but not limited to, measures to determine, ensure, or improve the effectiveness of such fishways prescribed in section 11 [of the Preliminary Prescription for Fishways] or otherwise. [...]

"Fish passage facilities and/or measures shall be developed in consultation with [USFWS], [NMFS],

³³ FERC Document Accession No. 20211028-5105

³⁴ FERC Document Accession No. 20211118-5124

and NHFGD consistent with [USFWS’s] design criteria ^[35]; and constructed, operated, and maintained to provide safe, timely, and effective passage for American eel and alosine species at the Licensee’s [i.e., the Applicant’s] expense.”

Section 11 of the Preliminary Prescription for Fishways includes, among other things, the following subsections: Design Populations (11.1); Design Criteria (11.2); Consultation (11.3); Fish Passage Operation and Maintenance Plan (11.4); Fishway Effectiveness Monitoring (11.5); Modifications (11.6); Fishway Inspections (11.7); Scheduling (11.8). Subject to change based on new information, evaluation of new literature and agency consultation, section 11.8 of the Preliminary Prescription for Fishways includes the following periods when approved fish passage protective measures will be operational.

Species	Upstream Migration Period	Downstream Migration Period
Alosines, American shad, river herring	April 15 – July 15	June 1 – November 15
American eel	May 1 – October 31	August 15 – November 15

On October 12, 2021, NHFGD filed a letter with FERC stating that it supported the Preliminary Prescription for Fishways (see Fact C-74 and Finding D-48).

NHDES concurs with the Preliminary Prescription for Fishways, including that the Applicant develop fish passage facilities or measures in consultation with USFWS, NMFS, and NHFGD consistent with USFWS design criteria; and those facilities and measures be constructed, operated, and maintained to provide safe, timely, and effective passage for American eel and alosine species at the Applicant’s expense.

D-50. Adequate upstream and downstream anadromous fish and American eel passage is required to comply with Surface Water Quality Standards, including, but not limited to, support of the aquatic life designated use (Env-Wq 1707.17(d) – Fact C-18), protection and propagation of fish (Env-Wq 1701.01 – see Fact C-10), and to help assure compliance with the “Biological and Aquatic Community Integrity” Surface Water Quality Standard (Env-Wq 1703.19 – see Fact C-36). Because the Project has created conditions and discharge characteristics that prevent adequate fish and eel passage up and downstream, and, therefore, compliance with Surface Water Quality Standards, fish and eel passage conditions are necessary. It is expected that implementation of the Preliminary Prescription for Fishways (Finding D-49), which include upstream and downstream passage for anadromous fish and American eel, and any future modifications to the fishway prescriptions that are acceptable to the USFWS, NHDES and NHFGD will result in compliance with Surface Water Quality Standards relative to fish passage. Condition E-15 addresses this Finding.

E. CERTIFICATION CONDITIONS

Unless otherwise authorized or directed by NHDES, the following conditions shall apply:

- E-1. **Effective Date and Expiration of Certification:** This certification shall become effective on the date of issuance and shall remain effective for the term of the federal license or permit. Should the federal authority deny a license or permit, the certification becomes null and void.
- E-2. **Conditions in Federal License or Permit:** Conditions of this certification shall become conditions of the federal license or permit (U.S.C. § 1314(d)).

³⁵ USFWS (U.S. Fish and Wildlife Service). 2019. Fish Passage Engineering Design Criteria. USFWS, Northeast Region R5, Hadley, Massachusetts. 135 pages + Appendices.

For an explanation and authority for this condition, see Fact C-2 and Finding D-1.

- E-3. **Compliance with Surface Water Quality Standards:** The Project shall not cause or contribute to a violation of Surface Water Quality Standards.

For an explanation and authority for this condition, see Facts C-2 and C-70 and Finding D-15.

- E-4. **Proposed Modifications to the Project:** The Applicant shall consult with and receive prior written approval from NHDES regarding any proposed modifications to the Project that could have a significant or material effect on the findings or conditions of this certification, including any changes to operation of the Project. If necessary, to assure compliance with Surface Water Quality Standards and associated management objectives, NHDES may alter or amend this certification in accordance with condition E-5.

For an explanation and authority for this condition, see Facts C-2 and C-8 and Finding D-12.

- E-5. **Modification of Certification:** The conditions of this certification may be altered or amended at any time by NHDES to assure compliance with Surface Water Quality Standards and associated management objectives, when authorized by law, and, if necessary, after notice and opportunity for hearing.

For an explanation and authority for this condition, see Facts C-2 and C-8 and Finding D-12.

- E-6. **Reopening of License:** NHDES reserves the right to request, at any time, that FERC reopen the license to consider modifications to the license to assure compliance with Surface Water Quality Standards.

For an explanation and authority for this condition, see Facts C-2 and C-8 and Finding D-12.

- E-7. **Compliance Inspections:** In accordance with applicable laws, the Applicant shall allow NHDES to inspect the Project and affected surface waters to monitor compliance with the conditions of this certification.

For an explanation and authority for this condition, see Facts C-2 and C-8 and Finding D-12.

- E-8. **Transfer of Certification:** Should this certification be transferred to a new owner, contact information for the new owner (including name, address, phone number and email) shall be provided to NHDES within 30 days of the transfer.

For an explanation and authority for this condition, see Facts C-2 and C-8 and Finding D-12.

- E-9. **NHDES Water Use Registration and Reporting:** The Applicant shall measure and report all withdrawals and discharges of the Project to the NHDES WURRP in accordance with RSA 488:3 and its supporting regulations in Env-Wq 2102.

For an explanation and authority for this condition, see Facts C-2, C-8, and C-54 through C-58 and Findings D-12 and D-42.

- E-10. **NHDES Water Conservation:** At all times that it is subject to water conservation requirements, the Applicant shall either comply with the rules for water conservation under Env-Wq 2101.05(f) and Env-

Wq 2101.24(a)(5) or hold a waiver to those rules under Env-Wq 2101.23 from NHDES.

For an explanation and authority for this condition, see Facts C-2, C-8, and C-60 through C-64 and Findings D-12 and D-43.

- E-11. **NHDES Coastal Zone Program:** The Applicant shall submit a CZMA Federal consistency certification to the New Hampshire Coastal Program in accordance with section 307(c)(3)(A) of the CZMA.

For an explanation and authority for this condition, see Facts C-2, C-8, C-65, and C-66 and Findings D-12 and D-44).

- E-12. **Flow / Impoundment Management:** The following requirements (items a. through e.) may be temporarily modified if required by operating emergencies beyond the control of the Applicant, as specified below, or as allowed in the approved Flow/Impoundment Compliance Monitoring Plan (FICMP) that is required by Condition E-14 of this certification. This certification does not require the Applicant to comply with the following requirements during an “emergency condition”, which is defined under Env-Wr 101.15 as the following: “(a) A situation has arisen at a dam which could jeopardize the integrity of the dam; or (b) Failure of the dam is imminent or has occurred.”

- a. **Run-of-River Flow:** The Applicant shall operate the Project in a run-of-river mode whereby inflow to the Project approximates outflow from the Project at all times and water levels above the dam are not drawn down for the purpose of generating power. Run-of-river operation may be temporarily modified if required by operating emergencies beyond the control of the Applicant or for short periods upon mutual agreement between NHDES, NHFGD, USFWS, and NMFS.

For an explanation and authority for this condition, see Facts C-2 and C-8 and Findings D-6, D-12 and D-37.

- b. **Bypass Facility Flows:** The Applicant shall comply with the following bypass facility water flow requirements.
1. From April 15 to June 30, the Applicant shall provide 20 cfs of flow through the fish ladder, 20 cfs of flow through the spillway for fish ladder attraction flow (i.e., trash sluiceway or dam slot), and 20 cfs of flow through the fish pipe (i.e., hooded sluiceway or downstream fish passage pipe). If inflow to the Project is less than 60 cfs, then the Applicant shall provide 20 cfs or inflow, whichever is less, through the fish ladder, and provide remaining flow equally through the fish pipe and spillway. For example, if inflow is 50 cfs, the Applicant shall provide 15 cfs through the fish pipe and spillway, and 20 cfs of flow through the fish ladder.
 2. From July 1 to December 31 or until ice forms on the Cocheco River within the Project boundary, the Applicant shall provide 20 cfs of flow through the downstream fish passage pipe. If inflow to the Project is less than 20 cfs, then the Applicant shall provide inflow through the downstream fish passage pipe.
 3. Subject to approval by NHDES and NHFGD, this criterion may be modified as part of the USFWS’s Fish Passage Prescription (see Condition E-15) in order to conform to the USFWS’s fish passage design guidelines (see footnote 35), or other guidelines acceptable to the USFWS.
 4. The manner in which the bypass flow is released to the bypass facility shall be acceptable to NHDES, NHFGD, and USFWS. The Applicant shall provide evidence within 60 days of receiving a written request from NHDES (or other date acceptable to NHDES), that demonstrates, to the satisfaction of NHDES and NHFGD, that the bypass facility flow is being provided. Such evidence may include, but is not limited to, hydraulic calculations and instream flow measurements.

5. The method and supporting information for passing the bypass facility flows, including any future modifications, shall be included in the Flow / Impoundment Compliance Monitoring Plan (see Condition E-14).
6. Flow in the bypass facilities shall comply with Surface Water Quality Standards, including, but not limited to, dissolved oxygen (Env-Wq 1703.07 – see Fact C-28).

For an explanation and authority for this condition, see Facts C-2 and C-8 and Findings D-6, D-12 and D-37.

- c. **Impoundment Water Level:** The target impoundment water elevation under normal operating conditions shall be the top of the flashboards (elevation 36.25 feet NGVD 29). The Applicant shall minimize the magnitude and frequency of fluctuations in the impoundment of the Project to the maximum extent practicable and shall not draw the water level in the impoundment down by more than one inch for the purpose of generating power. This requirement may be modified upon mutual agreement between NHDES, NHFGD, and USFWS. If requested by NHDES, the Applicant shall submit a plan for NHDES approval to minimize the magnitude and frequency of impoundment fluctuations to the maximum extent practicable, due to factors that may include, but are not limited to, Project power generation and flashboard failure. The plan shall be submitted to NHDES within 120 days (or other date acceptable to NHDES) of when the NHDES issues the written request. The Applicant shall then implement the NHDES approved plan.

For an explanation and authority for this condition, see Facts C-2 and C-8 and Findings D-6, D-12 and D-38.

- d. **Impoundment Refill Procedure:** When refilling the impoundment of the Project after drawdown for maintenance or emergencies, the Applicant shall maintain bypass facility flows specified in Condition E-12.b. to the extent practicable, and utilize the remaining inflow to refill the impoundment. This refill procedure may be modified upon mutual agreement between NHDES, NHFGD, and USFWS.

For an explanation and authority for this condition, see Facts C-2 and C-8 and Findings D-12 and D-39.

- e. **Drawdown Procedure for Scheduled Maintenance:** When drawing the water level in the impoundment down for scheduled maintenance, the Applicant shall lower the impoundment water level no more than six (6) inches per 24-hour period. During impoundment drawdown for scheduled maintenance, the bypass facility flows specified in Condition E-12.b shall be maintained to the extent possible. This drawdown procedure may be modified upon mutual agreement between NHDES and NHFGD.

For an explanation and citations, see Facts C-2 and C-8 and Findings D-12 and D-40.

- E-13. **Flow/Impoundment – Notification and Annual Report:** The Applicant shall comply with the following notification and reporting requirements:

- a. If the Project causes a deviation from the flow or impoundment management requirements in Condition E-12, the Applicant shall notify NHDES, NHFGD, and USFWS no later than 24 hours after each such incident. The notification shall include, to the extent known, an explanation as to why the deviations occurred, a description of corrective actions taken, and how long it will take until operations will comply with Condition E-12.

- b. Within 45 days after each incident, the Applicant shall submit a report to NHDES, NHFGD, and USFWS, that contains, to the extent possible, the cause, severity, and duration of the incident, any observed or reported adverse environmental impacts from the incident, pertinent data and a description of corrective measures.
- c. By April 1 of each year (beginning the first April after the date the FERC license is reissued), the Applicant shall submit to NHDES, NHFGD, and USFWS a summary report for the previous calendar year with appropriate tables, graphs, text and supporting documentation that demonstrates compliance with the flow/ impoundment management requirements in Condition E-12. For each deviation that occurred, if any, during the reporting period, the summary shall indicate when the deviation occurred, the duration of the deviation, and a description of corrective actions taken to prevent such deviation from reoccurring.

For an explanation and authority for this condition, see Facts C-2 and C-8 and Findings D-12 and D-37 through D-41.

- E-14. **Flow/Impoundment Compliance Monitoring Plan (FICMP):** Within 120 days of license issuance (or other date acceptable to NHDES) the Applicant shall develop, file with FERC, and implement a flow and impoundment level monitoring and compliance plan (FICMP) that includes, at a minimum, the following:
- a. A description of the type of manual and automatic operation of the Project, including on-site and remote operation;
 - b. A detailed description of how the Project will be operated under all conditions (i.e., under normal operating conditions as well as during low flow, high flow, maintenance, and emergency conditions) to maintain compliance with the flow and impoundment level management requirements in Condition E-12;
 - c. A description that includes calculations of how the bypass facility flows will be maintained during scheduled drawdowns and the minimum impoundment level that will pass the bypass facility flows;
 - d. A description of the mechanisms and structures (i.e., type, location and accuracy of all flow and impoundment elevation monitoring equipment and gages) to be used for maintaining compliance with operational requirements;
 - e. Set point elevations for turning turbines on and off;³⁶
 - f. Procedures for maintaining and calibrating monitoring equipment;
 - g. Rating curves and calculations for all methods of releasing flow downstream that includes a working Microsoft Excel spreadsheet;
 - h. Procedures for collecting and recording continuous data (i.e., no less frequent than hourly and preferably every 15 minutes) on inflow, flow releases at the Project (i.e., bypass facility flows, spillage, and turbine discharge), and impoundment levels; and
 - i. A mussel protection plan that articulates measures to be implemented to protect mussel species from Project impacts associated with impoundment drawdowns due to flashboard failure or required maintenance and limit the effect of Project operations on mussel species during any drawdown.

The FICMP, including any proposed revisions, shall be developed in consultation with NHDES, NHFGD, and USFWS, and submitted to NHDES for review and approval. The FICMP shall be kept up-to-date so that it reflects current operation of the Project. When revisions are made, the Applicant shall submit

³⁶ Set point elevations for providing bypass facility flows should account for the accuracy of the pond level sensor equipment. For example, if the accuracy is +/- 0.01 feet, the sensor should be set 0.01 feet above the elevation determined.

the updated FICMP to NHDES for approval within 10 days (or other date acceptable to NHDES) of making the revisions. If NHDES requests the FICMP to be updated, the Applicant shall submit the updated FICMP to NHDES for approval within 30 days (or other date acceptable to NHDES) of receiving a written request from NHDES to update the FICMP. The Applicant shall implement the approved FICMP.

For an explanation and authority for this condition, see Facts C-2 and C-8 and Findings D-12, D-21 and D-37 through D-41.

- E-15. **Fish Passage:** The Applicant shall comply with USFWS's Prescription for Fishways that it provides for the Project in accordance with section 18 of the FPA, including operating upstream and downstream fish passage protective measures during the periods provided in the Prescription for Fishways for the Project. As of the date this certification is granted, the Preliminary Prescription for Fishways is provided or summarized in Finding D-49 of this certification. If USFWS's Prescription for Fishways are modified after this certification is granted, the Applicant shall provide NHDES and NHFGD with a copy of the modified recommendations or prescription within 30 days of the modification.

For an explanation and authority for this condition, see Fact Facts C-2 and C-8 and Findings D-12, D-22 and D-45 through D-50.

- E-16. **Water Quality Improvement Plan (WQIP):** If NHDES determines that the Project is causing or contributing to a violation of Surface Water Quality Standards at a magnitude, duration, and frequency that contributes to an impaired designated use, then NHDES shall notify the Applicant in writing, and the Applicant shall submit a WQIP to NHDES for approval within 120 days of the notification or other time period mutually agreeable to the Applicant and NHDES. The purpose of the WQIP is to restore surface waters to meet Surface Water Quality Standards in accordance with Env-Wq 1703.01(b) for parameters that are influenced by the Project. If the riverine segment immediately upstream and beyond the influence of the Project impoundment is not meeting Surface Water Quality Standards, then the purpose of the WQIP is to restore surface waters so that the parameters of water quality that are influenced by the Project are not any worse than in the upstream riverine segment. Parameters that may be influenced by the Project include, but are not limited to, dissolved oxygen, temperature, pH, nutrients, chlorophyll-a, and secchi disk (i.e., turbidity). The WQIP shall include measures to achieve the purpose of the WQIP; a schedule for implementing the measures; water quality monitoring and reporting to determine the effectiveness of the implemented measures; and recommendations for next steps. The Applicant shall include in the WQIP the monitoring and reporting specified in Condition E-17 if there is violation of Surface Water Quality Standards for dissolved oxygen or temperature. The Applicant shall implement the approved WQIP upon NHDES approval of the plan. If the monitoring shows that properly implemented measures of the WQIP are not effective to achieve the purpose of the WQIP within 5 years from implementation of the measures, NHDES may request an amendment to the WQIP. In such cases, then NHDES shall notify the Applicant in writing, and the Applicant shall submit an amendment to the WQIP to NHDES for approval within 120 days of the request or other time period mutually agreeable to the Applicant and NHDES. The Applicant shall incorporate any changes to Project operation included in the approved WQIP, in the Flow/Impoundment Compliance Monitoring Plan (FICMP) and submit the updated FICMP to NHDES for approval as specified in Condition E-14. This Condition shall no longer apply once NHDES notifies the Applicant in writing that NHDES has determined (that the Applicant has achieved the purpose of the WQIP).

For an explanation and authority for this condition, see Facts C-2, C-8, C-25, and C-70 and Findings D-12, D-15 and D-34.

- E-17. **Long Term Water Quality Monitoring and Reporting:** In the event that Condition E-16 is triggered by a violation of Surface Water Quality Standards at a magnitude, duration, and frequency that contributes to an impaired designated use related to dissolved oxygen or temperature, and NHDES requests a WQIP, then the Applicant shall include in the WQIP a schedule to conduct water quality monitoring within the Project boundary of the Cocheco River at least every five years to: 1) determine the effects of Project operation, both spatially and temporally (in terms of flow, impoundment elevation and power generation) on water temperature and dissolved oxygen (i.e., dissolved oxygen concentration and dissolved oxygen percent saturation); 2) to compare results to Surface Water Quality Standards; and 3) to determine if additional changes in Project operation or the WQIP are necessary to comply with Surface Water Quality Standards.

In the WQIP specified in Condition E-16, the Applicant shall specify that it will submit a monitoring and reporting plan that describes, in detail, how, when and where monitoring will be conducted, and results reported. Unless otherwise authorized or directed by NHDES, the plan shall specify that monitoring that year shall last for at least five weeks and include periods of relatively low flows and high temperatures as well as at times when the Project is, and is not, generating power. Continuous (i.e., every 15 minutes) monitoring of temperature and dissolved oxygen (i.e., dissolved oxygen concentration and dissolved oxygen percent saturation) shall be conducted in the riverine reach just upstream of the Project impoundment, at the deep spot of the Project impoundment, and below the dam of the Project and the Project tailrace, and vertical profiles for temperature and dissolved oxygen shall be conducted each week at the deep spot of the impoundment. Continuous (i.e., every 15 minutes) estimates of impoundment elevation, inflow, tailrace flow, bypass facility flows, and generation shall also be provided.

By December 31st of each year that monitoring is conducted, the Applicant shall submit a report and supplemental information that clearly demonstrates via text, tables and plots, the spatial and temporal effect of Project operation (in terms of inflow and flow in the bypass reach and tailrace, impoundment elevation and power generation) on surface water quality and if Surface Water Quality Standards are met. Results of quality assurance/quality control checks (calibration, hand-held meter checks, duplicates, etc.) and identification of any deviations from the monitoring and reporting plan shall be clearly identified. In addition to the report, water quality (including uncorrected and any corrected data), continuous impoundment elevation, and continuous flow data (including calculations) should be provided in a working Microsoft Office Excel workbook or other database acceptable to NHDES. The Applicant shall also enter all data into the NHDES Environmental Monitoring Database (EMD) within 120 days of when monitoring is completed in each year monitoring is conducted.

Should monitoring indicate that violations of Surface Water Quality Standards for dissolved oxygen or temperature persist, the Applicant shall consult with NHDES and, if requested by NHDES in writing, submit an amended Water Quality Improvements Plan (WQIP) in accordance with Condition E-16.

For an explanation and authority for this condition, see Facts C-2, C-8, C-25, and C-70 and Findings D-12, D-15, D-34 and D-35.

F. ENFORCEMENT

Certification conditions are subject to enforcement mechanisms available to the federal licensing or permitting agency and to the state of New Hampshire, including those provided under NH RSA 485-A:12, III (see Fact C-8).

G. APPEAL PROCESS

Any person aggrieved by this decision may appeal to the N.H. Water Council (“Council”). An Environmental Fact Sheet with information on appealing a decision of the N.H. Department of Environmental Services can be found at the following link: [CO-7 \(nh.gov\)](https://www.nh.gov/CO-7). A link to the Council’s rules, is available on the [New Hampshire Environmental Council website](#) (or more directly at the [Water Council page](#)). Copies of the rules also are available from the NHDES Public Information Center at (603) 271-2975.

If you have questions regarding this certification, please contact James Tilley, NHDES Water Quality Certification Supervisor at (603) 271-0699 or james.w.tilley@des.nh.gov.

H. SIGNATURE AND DATE



Rene J. Pelletier, P.G., Director
NHDES Water Division

10/11/22
Date

ec: John N. Webster, Managing Partner, Cocheco Falls Associates L.P. (the Applicant)
John Mullen, Chair, Cocheco River Local Advisory Committee
J. Michael Joyal, Jr., City Manager, City of Dover
Bjorn Lake (NOAA-NMFS)
Ken Hogan (USFWS)
Michael Dionne (NHFGD)
Cheri Patterson (NHFGD)
Erin Holmes (NHDES)
Chris Williams (NHDES)
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