STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

IN THE MATTER OF

MERIMIL LIMITED PARTNERSHIP,	) MAINE WATER QUALITY PROGRAM
HYDRO KENNEBEC LLC, BROOKFIELD	) CLEAN WATER ACT
WHITE PINE HYDRO	)
Skowhegan, Norridgewock, Fairfield, Clinton,	)
Benton, Waterville, Winslow, Kennebec &	)
Somerset Counties	)
LOWER KENNEBEC DAMS	)
L-31534-33-A-N (approval)	)
L-11244-33-Q-N (approval)	)
L-19751-33-J-N (approval)	)
L-17472-33-L-N (approval)	) WATER QUALITY CERTIFICATION

Pursuant to the provisions of 38 M.R.S. §§ 464 *et seq*., Section 401 of the Clean Water Act (CWA), 33 U.S.C. § 1341, and Department Rules 06-096 C.M.R. Chapters 579-582, the Department of Environmental Protection (Department) has considered the applications for Water Quality Certification (WQC) of Merimil Limited Partnership, Hydro Kennebec LLC, and Brookfield White Pine Hydro LLC, all subsidiaries of Brookfield Renewable (collectively, the Applicant or Brookfield), with all supporting data, agency review comments, public review comments, and other related materials in the administrative record. Based on its best professional judgment and expertise, the Department makes the following findings of fact and conclusions.

I. APPLICATION SUMMARIES

A. Applications

In this certification, the Department evaluates whether WQC may be approved for the proposed relicensing of the Shawmut Hydroelectric Project and proposed license amendments at the Lockwood, Hydro Kennebec, and Weston Projects, which are currently pending before the Federal Energy Regulatory Commission (FERC). Both the relicensing application and the license amendment applications include proposed measures to implement a Species Protection Plan for federally listed Atlantic salmon, threatened Atlantic sturgeon, and endangered shortnose sturgeon in the Lower Kennebec River (the Kennebec Species Protection Plan). These proposed measures, specifically described in Section I(E) below, address fish passage for these species, as well as other diadromous species in the Lower Kennebec.

On October 21, 2024, the Applicant applied to the Department for WQC pursuant to Section 401 of the CWA for the proposed relicensing and continued operation of the existing Shawmut Hydroelectric Project P-2322 (Shawmut Project), located on the Kennebec River in the Towns of Skowhegan, Fairfield, Clinton and Benton, Kennebec and Somerset Counties, Maine. The application was accepted for processing on October 23, 2024.

The WQC Application for the Shawmut Project consists of the Department WQC Application form and attachments; a July 26, 2024, letter from FERC requesting a notice of whether the Applicant refiled for WQC; the Final License Application and Additional Information Request responses; 2024 Shawmut Fish Passage Measures; Kennebec River Management Plans; Kennebec Hydro Developers Group Agreement (KHDG) 1998; Kennebec Hydro Developers Group Agreement (KHDG) Status Summary/Chronology; the Applicant's 2021 Joint Permit Application with the U.S. Army Corps of Engineers; Preliminary Section 18 Prescriptions from the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS);[1] a Fish Passage Effectiveness Memo dated September 24, 2021 from the Applicant compiled by Normandeau Associates; the Biological Opinion from NMFS (NMFS BO);[2] the Draft Environmental Impact Statement from FERC (DEIS);[3] and the Applicant's comments on the DEIS.[4] The Department also expressly incorporates the Final Environmental Impact Statement from FERC (FEIS), which was issued after the Shawmut WQC application was received by the Department.

On May 8, 2025, the Applicant applied to the Department for WQC pursuant to Section 401 of the CWA for proposed license amendments to incorporate the Kennebec Species Protection Plan at the existing Lockwood (P-2574), Hydro-Kennebec (P-2611), and Weston (P-2325) Hydroelectric Projects, located on the Kennebec River in the Towns of Waterville and Winslow, Waterville and Winslow, and Skowhegan and Norridgewock, respectively.

The Lockwood, Hydro Kennebec, Shawmut, and Weston Hydroelectric Projects will herein be referred to collectively as "the Lower Kennebec Dams."

The WQC Applications for the Lockwood, Hydro Kennebec, and Weston Projects consist of the Department WQC Application form and attachments; Lower Kennebec Species Protection Plan and Draft Biological Assessment;[5] the Applicant's 2021 Joint Permit

[1] FERC E-library Accession # 20211112-5250.
[2] FERC E-library Accession # 20230320-5179.
[3] FERC E-library Accession # 20240328-3000.
[4] FERC E-library Accession # 20240604-5191.
[5] FERC E-library Accession # 20191231-5199.

Application with the U.S. Army Corps of Engineers; the Final Environmental Impact Statement (FEIS) from FERC;[6] and the Biological Opinion from NMFS (NMFS BO).

Changes to operations proposed in the Kennebec Species Protection Plan may result in a discharge to the Kennebec River; therefore, the Department must determine in this WQC whether the license amendments will comply with applicable water quality standards. Because the Kennebec Species Protection Plan proposed measures are related to fish passage, the Department evaluates the Lockwood, Hydro Kennebec, and Weston Project applications only as to whether they meet State water quality standards for fish passage.

The Department specifically evaluates the "Staff Alternative with Mandatory Conditions" evaluated by FERC in the FEIS as the preferred alternative. The FERC FEIS considers the environmental effects of relicensing the Shawmut Project and amending the licenses of the Weston, Hydro-Kennebec, and Lockwood Projects to incorporate the Kennebec Species Protection Plan. The "Staff Alternative with Mandatory Conditions" includes all of NMFS's BO terms and conditions and the Section 18 Fishway Prescriptions.

B. History

Lockwood

On July 25, 1984, the Maine Board of Environmental Protection (Board) issued a Maine Waterway Development and Conservation Act (MWDCA) Permit and WQC for the Lockwood Project, Order #L-10121-35-A-N. Order #L-10121-35-E-M, dated February 24, 1988, modified #L-10121-35-A-N to incorporate the terms of the Kennebec Hydro Developer Group (KHDG) Agreement.[7] Order #L-10121-35-G-M, dated August 3, 1998, modified the terms of the MWDCA Permit and WQC to incorporate the terms of the Kennebec Accord,[8] which included provisions for supporting the removal of the Edwards Dam and the installation of a trap-and-truck facility, permanent downstream fish passage facilities, and provisions for upstream fish passage facilities. On August 26, 2004, the Department issued Order #L-20218-33-C-N approving WQC for the Lockwood Hydroelectric Project. That WQC was incorporated into a new FERC license issued on March 4, 2005.

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[6] FERC E-library Accession # 20250228-3002.

[7] The 1987 KHDG Agreement was a settlement between the owners of the Lower Kennebec Dams, along with several other hydropower projects on the Kennebec and Sebasticook Rivers; the Kennebec Coalition; USFWS; NMFS; and the State of Maine. The KHDG Agreement was designed to facilitate the restoration of American shad, river herring, and Atlantic salmon in the Kennebec River basin.

[8] In 1998, the owners of the former Edwards Hydroelectric Project (FERC No. 2389) and seven upstream projects, including the Lockwood, Hydro Kennebec, and Weston Projects, entered into an agreement with the KHDG signatories, replacing the KHDG Agreement with the Kennebec Accord.

Hydro-Kennebec

On June 6, 1986, the Board issued an MWDCA Permit and WQC for the Hydro Kennebec Project, Order #L-11244-35-A-N. The WQC was incorporated into a new FERC license issued October 10, 1986. Order #L-112441-35-E-M, dated February 24, 1988, modified Order #L-11244-35-A-M to incorporate the terms of the KHDG Agreement. Order #L-11244-35-I-M, dated August 3, 1998, modified the terms of the MWDCA Permit and WQC to incorporate the terms of the Kennebec Accord, which included provisions for supporting the removal of the Edwards Dam, permanent downstream passage, and provisions for upstream fish passage. These modifications were incorporated into the FERC license on September 16, 1998.

Shawmut

On October 14, 1980, the Department issued a WQC for ongoing operation of the Project. Effective February 1, 1981, FERC issued a New License for the Project for a term of 40 years. Order #L-19751-33-A-M, dated July 31, 1998, modified and replaced the 1980 WQC to incorporate the terms of the Kennebec Accord. On December 11, 2018, FERC issued an Order extending the Shawmut Project license term by one year, until January 31, 2022.

Brookfield filed a Final License Application for the Shawmut Project in January 2020 and filed a WQC application with the Department in August 2020. The Department issued a draft decision denying the WQC application on August 11, 2021. Brookfield subsequently withdrew its WQC application and submitted a new WQC application to the Department on October 18, 2021. The Department then issued a denial without prejudice of Brookfield's WQC application on October 12, 2022 (Order #L-19751-33-I-N).

On November 14, 2022, Brookfield filed a petition for review with the Somerset County Superior Court for review of the Department's decision. Brookfield also brought a challenge in the D.C. Circuit Court of Appeals to FERC's determination that the Department had not waived certification. On January 17, 2024, the Somerset County Superior Court denied that appeal, issuing a decision upholding the Department's Order denying without prejudice the WQC for the Shawmut Project. The D.C. Circuit denied the Applicant's appeal by Order dated July 5, 2024, and the Applicant did not Appeal the Order.

Weston

On November 17, 1992, the Board issued an MWDCA Permit and WQC for the Weston Project, Orders #L-17472-35-A-N and #L-17472-33-A-N. The WQC was incorporated into a new FERC license issued November 25, 1997. Order #L-17472-33-C-M, dated July 31, 1998, modified Order #L-17472-33-A-N to incorporate the terms of the Kennebec Accord. These modifications were incorporated into the FERC license on September 16, 1998.

C. Existing Project Features

Lockwood

The Lockwood Project is located at river mile 63 and is the first dam moving upstream on the mainstem of the Kennebec River. The Lockwood Project consists of a dam with two spillway sections, a headworks and forebay canal, two powerhouses, an upstream anadromous fish lift, two short segments of transmission line, and one recreation facility in the tailrace. The dam and forebay headworks span the Kennebec River immediately upstream and downstream of the U.S. Route 201 Bridge along a site originally known as Ticonic Falls.

1) *Project Dam*: Lockwood Dam consists of three sections: (1) an 875-foot-long, 17-foot-high non-overflow concrete gravity dam; (2) an approximately 650-foot-long west spillway section with a fixed crest elevation ranging from 50.91 feet to 52.0 feet, and fitted with 15-inch-tall wooden flashboards; and (3) a 225-foot-long east spillway section with a fixed crest elevation of 50.91 feet, and fitted with 15-inch-tall wooden flashboards.

   The two spillway sections impound the river on either side of a small island. Beginning upstream at the east dam abutment, the east spillway extends about 225 feet in a westerly direction to the small river island where it joins the west spillway section. The west spillway section extends about 650 feet from the small island in a southwesterly direction to its terminus at the non-overflow dam. The non-overflow dam continues in a southwesterly direction to a point where it turns about 90 degrees and extends to the west shoreline at the west dam abutment. At the intersection of the east spillway and non-overflow dam sections, a forebay headworks structure (described below) extends across the forebay to the west shoreline.

2) *Project Impoundment*: Lockwood Dam creates an approximately 1.2-mile-long impoundment with a surface area of 81.5 acres and a gross storage volume of 250

acre-feet at the normal full pool elevation of 52.16 feet mean sea level (msl) when the flashboards are in place. [9]

3) *Project Forebay and Powerhouses:* Flow from the impoundment passes through the forebay headworks, down the forebay canal, and into the powerhouse intakes. The forebay headworks structure is a 160-foot-long, 29.5-foot-tall concrete structure that spans the upstream end of the forebay canal and contains eleven 8.5-foot-wide, 12-foot-high headgates and one 6-foot-wide, 5.5-foot-high filler gate. There are two powerhouses at the downstream end of the forebay canal: the original 1919 powerhouse containing six vertical Francis units and the 1989 powerhouse containing one horizontal Kaplan unit. The maximum operating capacity of Units 1-6 is 3,960 cubic feet per second (cfs), while the maximum operating capacity of Unit 7 is 1,700 cfs. Combined, the powerhouses have a total installed capacity of 6.915 megawatts (MW) and a maximum operating capacity of about 5,420 cfs.

   Both powerhouse intake structures are fitted with full depth trash racks. The clear bar spacing on the 1919 powerhouse intake is 2 inches, and the spacing on the 1989 Powerhouse intake is 3.5 inches. The powerhouse tailrace returns flow to the Kennebec River about 1,300 feet downstream from the upstream-most (east) spillway section, creating a 1,300-foot-long bypassed reach.

4) *Fish Passage Facilities*

   a. Upstream: Upstream passage for anadromous fish at the Lockwood Project is currently provided via a fish lift. It is designed to annually pass up to 164,640 alewife and blueback herring (river herring), 228,470 American shad, and 4,750 Atlantic salmon. The fish lift does not provide swim-through access into habitats upstream and instead is operated as a trap and haul facility. Brookfield operates the fish lift annually from May 1 to October 31. During the river herring, shad, and Atlantic salmon peak upstream migration season, which lasts from approximately May through mid-July, Brookfield generally operates the fish lift seven days per week, from early morning to evening. The timing and frequency of lifts vary based on the number of migrating fish, water temperatures, and river flow.

      During the remainder of the passage season, lift cycles are less frequent and are specifically for the capture of Atlantic salmon. Pursuant to the Maine Department of Marine Resources' (DMR) Atlantic salmon handling protocol, Brookfield does

[9] All references to elevations in this license are based on U.S. Geological Survey (USGS) datum, as reported by the Applicant in its WQC application materials.

not operate the fish lift when the river water temperature exceeds 24.5 degrees Celsius (°C), to prevent injury or mortality of Atlantic salmon. However, if the temperature threshold is exceeded while shad are still migrating, Brookfield consults with DMR to determine whether to continue to operate the fish lift for shad passage.

The fish lift operates with an attraction flow of approximately 170 cfs and an entrance flow velocity of 4 to 6 feet per second (fps). A 1,800-gallon hopper discharges water and fish into a 12-foot diameter, 2,500-gallon sorting tank. River herring and shad are sorted into one of two 10-foot diameter, 1,250-gallon sorting tanks. Atlantic salmon are removed and held in a 250-gallon isolation tank. Liquid oxygen is supplied to the sorting tanks and isolation tank to maintain safe dissolved oxygen (DO) levels at all times. Two auxiliary water pumps provide a constant flow of ambient river water to the sorting and isolation tanks. Brookfield uses block ice, as necessary, to reduce water temperature in the Atlantic salmon isolation tank. Other species of non-anadromous fish captured in the fish lift are returned to the tailrace via a discharge pipe. At the direction of the Maine Department of Inland Fisheries & Wildlife (DIFW) and DMR, undesirable fish species (e.g., carp, white catfish, northern pike, and gizzard shad) are removed and euthanized.

There is one permanent upstream eelway at the Lockwood Project, which is located on the eastern side of the spillway at the upstream end of the bypassed reach. The 50-foot-long eelway consists of a 12-inch-wide by 4-inch-high aluminum trough with netted mesh substrate. The eelway consists of three sections of ramp and one turn pool. Eels exit the ramp into a collection trap so that Brookfield can count the number of eels using the facility before releasing them into the impoundment.

b. Downstream: Downstream fish passage is provided via a 7-foot-wide by 9-foot-deep mechanical overflow gate (fish bypass sluice) located on the east side of the forebay canal just upstream of the Unit 1 trash rack, which discharges directly to the river adjacent to the forebay. Maximum flow through the gate is 6% of station capacity (i.e., 340 cfs). In 2009, Brookfield installed a floating guidance boom to enhance downstream passage. The boom extends from the west shoreline of the forebay canal downstream at an angle to the fish bypass sluice. Following several years of evaluation and modifications to the original guidance boom, the current design consists of a 300-foot-long boom with the first 250 feet consisting of 4-foot-deep steel punch plate panels (5/16- inch diameter holes), with an additional

six feet of Dyneema[10] curtain attached to the bottom of each panel. The lower 50-foot section of boom consists of 10-foot-deep steel punch plate panels. In addition to the fish bypass sluice, downstream passage is provided by three submerged orifices (3 feet long by 8 inches high) cut into the flashboards along the spillway. There is an additional sluice gate with a capacity of 60 cfs in the forebay between the two powerhouses (surface sluice) that Brookfield operates for downstream passage. Flow exiting the surface sluice discharges into a plunge pool in the river, which is approximately 8 feet deep. The surface sluice provides an additional non-turbine passage route for fish that sound beneath the guidance boom.

Hydro-Kennebec

The Hydro-Kennebec Project is located at river mile 64 and is the second dam on the mainstem of the river. The Hydro-Kennebec Project consists of a dam, forebay, impoundment, powerhouse, fish lift, short segment of transmission line, and one recreation facility located about 2 miles upstream of the dam along the impoundment.

1) *Project Dam*: The Hydro-Kennebec Dam consists of a 555-foot-long ungated concrete gravity spillway structure, a 200-foot-long gated spillway, and an 18-foot-long east abutment section. The ungated spillway structure is 40 feet high at its maximum height, with a permanent crest elevation of 75 feet, and includes 6-foot-high wooden flashboards. The gated spillway section has a permanent crest elevation of 68 feet and is topped with three hydraulically controlled 15-foot-tall by 60-foot-wide bascule gates.

2) *Project Impoundment*: The dam creates an approximately 2.9-mile-long impoundment. At a normal full pool elevation of 81 feet, the impoundment has a surface area of 250 acres and a gross storage capacity of 3,900 acre-feet.

3) *Powerhouse*: The powerhouse is located on the east side of the dam and is 106 feet long and 62.17 feet wide at its base. The intake has steel trash racks with 3.5-inch clear bar spacing. The powerhouse contains two Kaplan turbine-generator units, each with an operating range of 1,550 to 3,961 cfs and a total nameplate capacity of 15.4 MW. Flow from the turbines discharges to the tailrace, which flows back into the Kennebec River. The tailrace is separated from the Kennebec River by a narrow section of bedrock.

4) *Fish Passage Facilities*

[10] Dyneema is an ultra-high molecular weight, nontoxic polyethylene fiber.

a. Upstream: A fish lift was constructed and started operation in September 2017. The facility was designed in consultation with the federal fishery agencies and is designed to annually pass 12,000 Atlantic salmon, 210,000 American shad, 150,000 alewife, and 1,200,000 blueback herring. The fish lift consists of a tailrace entrance located immediately downstream of the project powerhouse, a hopper elevator system, exit flume, and upstream exit located adjacent to the project's abandoned gatehouse. The concrete entrance is 14 feet wide and equipped with an adjustable overshot attraction flow gate. Fish are guided through a curved concrete entrance chamber leading to a 14-foot-wide by 20-foot-long lower flume. The elevator raises the hopper approximately 45 feet to discharge fish and water to a 470-foot-long exit flume.

   A 40-foot-wide attraction water intake screen with 3/8-inch-diameter holes and associated lifting structure (for cleaning) is installed adjacent to the fishway exit to allow for screening of attraction flow. The fish lift facility is designed to operate under a normal headpond elevation of 81.0 feet, a normal tailwater elevation of 54.0 feet, and river flows between 2,300 and 23,000 cfs.

   The fish lift has a minimum cycle time of approximately 10 minutes and can be operated in either automatic or manual mode. Water flow within the fish lift is adjusted by a series of manually controlled gates and valves. The system is designed to pass a range of attraction flow at the entrance gate of between 240 to 400 cfs. Flow velocity is maintained at approximately 1 to 1.5 fps in the exit flume, 1 to 1.5 fps over the hopper, 2 to 4 fps in the entrance channel, and 4 to 6 fps at the fishway entrance.

   There is one upstream eelway located on the west side of the ungated spillway section of the dam. The eelway consists of an aluminum ramp divided into three sections: (1) a 13-foot-long section that rises along the dam face at an angle of 62 degrees, (2) an 8-foot-long flat resting area, and (3) a 25-foot-long upper section that rises at an angle of 45 degrees. The eelway is lined with a mesh climbing substrate.

b. Downstream: The downstream passage facility consists of a floating angled guidance boom extending from the east shoreline of the dam across the forebay toward the 4-foot-wide by 8-foot-deep gated surface bypass located just upstream of the west side of the powerhouse. The surface bypass discharges into a plunge pool beneath the bascule gate spillway. The surface bypass can pass 320 cfs (4% of station hydraulic capacity). The guidance boom consists of 10-foot-deep steel perforated plates with 5/16-inch openings. Brookfield has modified the plunge

pool to deepen it several times since 2006 to improve fish survival through the facility.

Shawmut

The Shawmut Dam is located on river mile 66 and is the third dam on the mainstem of the river. The existing Project consists of a 23-foot-high, 1,135-foot-long concrete gravity dam topped with three sections of rubber bladders totaling 730 feet in length that inflate to a height of 4.46 feet; a 1,310-acre reservoir extending upstream for approximately 12.3 miles; a forebay; two powerhouses containing eight generating units with a total generating capacity of 8.65 MW; and appurtenant facilities.

1) *Project Dam*: The Shawmut Dam is a concrete gravity type overflow structure with the fixed crest at elevation 108.0 feet. The spillway section is comprised of several sections totaling 1,135 feet in length, with an average height of approximately 24 feet; the total dam is approximately 1,480 feet in length. The spillway section is approximately 19 feet high, has 380 feet of 4-foot-high hinged flashboards serviced by a steel bridge with a gantry crane; a 25-foot-wide sluice with a timber and steel gate having a crest elevation of 104.0 feet; a 730-foot-long section topped with three sections of rubber bladders that inflate to a height of 4.46 feet; and a non-overflow section between the hinged flashboards and the forebay headworks structure. An earthen dike with a concrete core wall is located beyond the west abutment of the headworks structure.

2) *Project Impoundment:* The Shawmut Dam impounds the Kennebec River and has a normal pond elevation of 112.0 feet. The Shawmut impoundment has an estimated volume of 4,960 acre-feet but because the Project operates as a run-of-river[11] facility, the impoundment has no significant usable storage capacity under normal operating conditions. The Shawmut impoundment has a surface area of 1,310 acres at normal full pond elevation and extends approximately 12 miles upstream of the Project dam.

3) *Forebay*: The forebay is located immediately downstream of the headgate structure and is enclosed by the two powerhouse structures. The 1912 powerhouse is located to the east, and the 1982 powerhouse is located to the south of the forebay. A retaining wall, approximately 240 feet in length, is located on the west side of the forebay. A second process water intake for the former Keyes Fibre Company is located in this forebay and is similar to the one installed in the headworks structure. Located at the south end of the forebay between the powerhouses are three gates,

[11] Where outflow generally approximates inflow.

including a 10-foot-high by 7-foot-wide Tainter gate, a 6-foot-high by 6-foot-wide deep gate, and a 4-foot-wide by 22-inch-high sluice gate fitted with three stop logs. Collectively, these three gates provide the primary downstream bypass route(s) for diadromous fish.

4) *Powerhouses*: The 1912 powerhouse structure, water wheel flumes, and intake section are 86 feet wide by 148 feet long and are constructed of reinforced concrete. The walls of the 1912 powerhouse superstructure are built of brick. The building is 35 feet wide by 148 feet long. Approximately one-third of the building is two stories high. Steel columns are embedded in the downstream wall of the powerhouse for support of the bridge crane beam and the steel framing used for the second-story floor. The roof is constructed of reinforced concrete supported by concrete-encased steel beams. There is an overhead crane for handling equipment. The water wheel flume and intake section have six open flumes, each fitted with two 10.5-foot-high by 14-foot-wide double leaf slide gates and a continuous trash rack with 1.5-inch clear spacing. There are six turbines and six generators located in the 1912 powerhouse.

   Turbines in the 1912 powerhouse are each horizontal, four-runner, Francis-type turbines rated at 1,200 horsepower (hp) each; five of the six generators are rated at 750 kilowatts (kW) each, the sixth is rated at 900 kW. The 1982 powerhouse substructure and superstructure are approximately 59 feet long by 43 feet wide and are constructed of reinforced concrete. The building is approximately 28 feet high from roof to generator floor, and the substructure extends down to a maximum depth of approximately 20 feet below the generator floor in the tailrace draft area. The roof is reinforced concrete supported by steel beams. An equipment service hatch is located on the roof. An overhead bridge crane is used to service powerhouse equipment. The intake section is constructed of reinforced concrete containing two openings fitted with vertical headgates, approximately 12 feet high by 12 feet wide with trash racks with 3.5-inch clear spacing, that are operated by hydraulic cylinders. The trash racks are serviced by a track-mounted, hydraulically operated trash rack rake with trash removal capabilities.

   The 1982 powerhouse contains two horizontal tube-type turbines, each rated at approximately 2,880 hp, and two generators rated at 2,000 kW each. The total installed capacity of the Project, limited by the generator nameplates for each unit, is 8,650 kW. The Project-related transmission facilities include three step-up transformers located in a Central Maine Power Company substation adjacent to but outside of the Project Boundary. Generator leads between the powerhouses and the point of interconnection within the local utility substation are approximately 250 feet from the 1912 powerhouse.

5) *Headworks and Intake*: The headworks and intake structure are integral to the Project dam. The forebay intake section contains 11 headgates and two filler gates. Five of the headgates are installed in openings that are 10 feet by 15.5 feet, and six are installed in openings that are 10 feet by 12.5 feet. The two filler gates measure 4 feet by 6 feet. The headgates are fitted with trash racks. In the 1912 powerhouse, the intake section has six open flumes, each fitted with two 10.5-foot-by-14-foot double leave slide gates and a continuous trash rack that extends from elevation 115.0 feet to elevation 88.0 feet. The clear spacing of the racks in front of units 1-6 is 1.5 inches. The trash racks screening units 7 and 8 intakes (in the 1982 powerhouse) extend from elevation 115.25 feet to 88.0 feet and have clear spacing of 3.5 inches. The westerly non-overflow section contains a 2-foot-high by 2-foot-wide steel gate, which was formerly used as an intake for process water for the now-demolished Keyes Fibre Company mill, formerly located adjacent to the Project. A retaining wall connects the west end of the non-overflow section to a concrete cut-off wall, which serves as a core wall for the earthen dike.

6) *Tailrace:* The Project tailraces are excavated riverbed located downstream of the powerhouses. The normal tailwater elevation of the stations is approximately 88.0 feet. Water is released from the 1982 powerhouse into a 300-foot-long tailrace approximately 45 feet wide and 12 feet deep. The tailrace of the 1912 powerhouse is approximately 140 feet wide and 12 feet deep and extends approximately 175 feet downstream. The two powerhouse tailraces are separated by an island and retaining wall.

7) *Fish Passage Facilities*

   a. Upstream: There are no existing upstream fish passage facilities for anadromous fish at the project. There are two upstream eelways installed at and near the dam that are seasonally operated from June 15 to September 15. One is located between the west end of the hinged flashboard section and the Unit 1 tailrace, and the other is located between the two powerhouses.

   b. Downstream: Downstream fish passage for diadromous fish species is primarily provided by releasing flow through three different gates located in the forebay between the two powerhouses: (1) a 22-inch-high by 4-foot-wide sluice gate; (2) a 10- foot-high by 7-foot-wide Tainter gate; and (3) a 6-foot-high by 6-foot-wide deep gate (located under the Tainter gate). The sluice gate is located adjacent to the 1912 Powerhouse. The Tainter and deep gates are located next to the sluice gate and the 1982 Powerhouse.

Fish and flows exit the three gates into two plunge pools. The Tainter and deep gates discharge to a plunge pool that is an excavated area of the river channel about 4 feet deep, 10 feet wide, and 8 feet long. The sluice gate discharges to a boxed plunge pool that is 3 feet deep and about 10 feet wide and 10 feet long. The boxed plunge pool flows into the excavated plunge pool below the Tainter and deep gates.

Weston

The Weston Project is located at river mile 81.5 and is the fourth hydroelectric development on the mainstem of the Kennebec River. The Weston Project includes two dams, an impoundment, one powerhouse, generator leads for power transmission, and several recreation facilities near the dams. The two dams are constructed on the north and south channels of the Kennebec River, where the river is divided by Weston Island.

1) *Project Dam*: North Channel Dam is a concrete gravity and buttress dam with a maximum height of 38 feet and a crest elevation of 156.0 feet msl. The dam is a broad V-shaped structure and extends about 520 feet from the north bank of the Kennebec River in a southwesterly direction to Weston Island. From north to south, the dam consists of four sections: (1) a 22.5-foot-long concrete non-overflow section (with a top elevation of 167.2 feet); (2) a 244-foot-long stanchion section (with five stanchion gates); (3) a 160.5-foot-long pneumatic gate (Obermeyer gate) section; and (4) a 93-foot-long Tainter gate section located adjacent to the island, with two steel Tainter gates. The stanchion section has five 10.5-foot-high stanchion bays set on sills at elevation 145.5 feet separated by 3- and 4-foot-wide concrete piers. The pneumatic gates are split into two sections, with lengths of about 82 feet and 79 feet, and consist of inflatable bladders with 7.5-foot-high steel panels and a permanent crest elevation of 149.0 feet. The Tainter gate section includes two steel Tainter gates, each 28 feet wide by 16 feet high, with sills at an elevation of 140.0 feet. Brookfield refers to each of the Tainter and inflatable bladder gates as the “left” and “right” gates when looking downstream.

   South Channel Dam is a concrete gravity and buttress dam that is about 392 feet long and 51 feet high, with a crest elevation of 156.0 feet. The dam extends between abutment walls on Weston Island and the south bank of the Kennebec River, and consists of five sections: (1) a 33- foot-long concrete spillway (with a permanent crest elevation of 154.0 feet, topped by 2-foot- high stoplogs); (2) a 24-foot-long log sluice section; (3) an 188-foot-long stanchion section with five stanchion bays; (4) a 22-foot-long concrete non-overflow section; and (5) a powerhouse section that is approximately 125 feet long. A 14-foot-high Tainter gate controls flows through the

log sluice, which extends 69.5 feet downstream and is used to provide downstream fish passage.

2) *Project Impoundment*: The Weston Project creates a 930-acre-feet impoundment that extends 12.4 miles upstream.

3) *Forebay and Powerhouses:* The powerhouse and intake section of the North Channel Dam, located adjacent to the north abutment and integral to South Channel Dam, includes the headworks and four intake bays, one for each of the four vertical Francis turbine generator units. Each intake bay houses three reinforced concrete gates that can isolate flow to the individual turbines. The units have a total maximum operating capacity of approximately 5,500 cfs and a total installed capacity of 14.178 MW. The intakes are fitted with full-depth trash racks with 4.0-inch clear bar spacing.

   The powerhouse returns flow to the Kennebec River immediately downstream of South Channel Dam, creating an approximately 750-foot-long bypassed reach between North Channel Dam and the powerhouse tailrace.

4) Fish Passage Facilities

   a. Upstream: There are currently no upstream anadromous fish passage facilities at the Weston Project. Brookfield operates one permanent upstream eelway, which is located near the western end of the stanchion gates on South Channel Dam. It consists of two sections of aluminum trough ramp connected by one turn pool, with the exit and associated discharge pipe to the impoundment attached to the top of a stanchion gate. The aluminum trough is 24 inches wide with 5-inch high walls.

   b. Downstream: Brookfield provides downstream passage through the South Channel Dam log sluice and associated 70-foot-long concrete flume that discharges into a plunge pool beneath the dam. The Tainter gate that regulates flow through the sluice is capable of discharging up to 2,500 cfs (approximately 45% of station unit flow) but is typically operated for fish passage to provide 8% of station unit flow (440 cfs) from April 1 to June 15 for smolts, 6% of station unit flow (330 cfs) from September 15 to October 31 for 8 hours at night for eels, and 6% from November 1 to December 31 for kelt passage.

      Fish are guided to the log sluice by a 300-foot-long floating guidance boom that extends from Weston Island across the forebay in front of the turbine intakes to its

terminus at the log sluice. The boom consists of 10-foot-deep metal punch plate panels with 5/16-inch openings.

Brookfield does not currently operate any of the North Channel Dam facilities for dedicated fish passage, but additional non-turbine passage routes are available when flow is spilled through the Tainter gates, pneumatic gates, and stanchion gates during high flows.

D. Existing Project Operations

Lockwood

The Project is operated in a run-of-river mode with a normal full pool elevation of 52.16 feet msl when the spillway flashboards are in place, and approximately 49.91 feet msl (1 foot below the spillway crest) when the flashboards are being replaced. The project is operated to provide an instantaneous minimum flow of 2,114 cfs or inflow, whichever is less, below the powerhouses to maintain downstream aquatic habitat in the river. Under current operations, Brookfield operates the fish sluice at a flow of 340 cfs from April 1 to December 31. For upstream passage, Brookfield operates the fish lift with an attraction water flow of 170 cfs from May 1 to October 31. Brookfield is also required to release a 50-cfs minimum flow into the bypassed reach, which is provided by releasing 25 cfs through the submerged orifices in the flashboards and 25 cfs through spillway leakage. Flows in excess of bypassed reach minimum flows and fishway operating flows are passed through both powerhouses up to their maximum operating capacities of 5,420 cfs. Additional flow above these levels is passed over the east and west spillway sections. The Lockwood Project generates about 41,082 megawatt-hours (MWh) of energy per year

Hydro-Kennebec

The Project is operated in a run-of-river mode. Brookfield typically maintains the impoundment near the top of the flashboards at the normal pool level of 81 feet. Brookfield currently spills 320 cfs through the surface bypass for downstream fish passage from April 1 to December 31. Once downstream bypass flow requirements are met, Brookfield diverts flow up to the 7,922-cfs maximum hydraulic capacity of the turbines through the powerhouse. Additional flow above these levels is spilled through the Bascule gates and flashboard spillway section. The Hydro-Kennebec Project generates about 88,500 MWh of energy per year.

Shawmut

The Project is operated in a run-of-river mode, and the impoundment water level is generally maintained within 1 foot of normal full pond elevation of 112.0 feet. Operated in this manner, the Project has no appreciable storage or flood control capacity. Total Project outflow varies, based on the use of generating units, gates, and spillway mechanisms, including flashboards and rubber dam sections, to manage impoundment water levels as prescribed by run-of-river operations. The rubber bladder sections can only be fully inflated or fully deflated; each of the three sections can pass up to approximately 7,000 cfs when deflated at elevation 112.0 feet. The top elevation of the rubber bladders is 112.5 feet, allowing 0.5 feet of freeboard above the normal impoundment elevation. The Project is operated remotely with a Supervisory Control and Data Acquisition System link to Brookfield White Pine Hydro's National System Control Center in Marlborough, Massachusetts. A local crew is available as necessary to conduct routine maintenance and operations at the Shawmut station. The dam is inspected by White Pine Hydro Engineering and Operations staff during an annual two-week shutdown, and as needed. During both scheduled and unscheduled maintenance and unit shutdowns, the Project continues to pass inflows downstream through operation of remaining generating units, through the spillway sluice, or through spill achieved by deflating one or more of the rubber bladders, as necessary.

Weston

The Project is operated in a run-of-river mode, maintaining the impoundment water surface elevation within 1 foot of the normal full pond elevation during normal operations. A minimum flow requirement of the current license requires Brookfield to maintain a minimum flow of 1,947 cfs or inflow, whichever is less, as measured in the project tailrace immediately downstream of South Channel Dam.

Brookfield operates the downstream fish passage facilities from April 1 to June 15 and September 15 to December 31 as described above. When flows exceed powerhouse capacity and fish passage flows, Brookfield spills excess flow over the spillways. The Weston Project generates about 89,453 MWh of energy per year.

E. Project Proposals[12]

The Department will evaluate the following proposals related to fish passage measures in the applications. These measures include all measures directly proposed by the Applicant

[12] Proposals related to any construction contemplated in the FEIS are not included here because they would be contemplated in the MWDCA permitting process.

as well as those required in the Staff Alternative with Mandatory Conditions from the FEIS. No new power development structures or generating facilities are proposed in these applications. No new power development structures or generating facilities are proposed in these applications.

Lockwood

- To provide volitional upstream passage at the Lockwood Project, construct and operate a new vertical slot fishway with an auxiliary water supply (AWS) spillway in the Lockwood bypassed reach. The fishway would be constructed on the east side of the river at the head of the bypassed reach and consist of a concrete, vertical slot fishway. The fishway would also include a new permanent access road to enable operation and maintenance of the fishway.
- Continue to operate the existing fish lift from May 1 to October 31 as a trap and haul facility in coordination with Maine DMR until completion and permanent operation of all new upstream fishways at all four projects. Once all new upstream anadromous fishways are constructed at all four projects and have been tested for salmon passage effectiveness, consult with the agencies on how to operate the Lockwood fish lift for the remainder of the license term.
- Continue to operate upstream eelways from June 15 to September 15 for eel passage.
- To protect downstream migrating salmon smolts, shut down the turbines for 12 hours at night for 4-5 weeks (28-35 days) during the spring to cover 97% of the smolt outmigration (typically beginning the last week of April). The specific start date and duration of the shutdowns in any given year would be determined in consultation with NMFS and Maine DMR.
- Operate the new volitional fishway AWS spillway at a flow of 220 cfs from May 1 to October 31 for downstream fish passage.
- Continue to operate and maintain the existing forebay guidance boom to direct downstream migrating fish to the fish bypass sluice.
- Continue to operate the fish bypass sluice at a flow equal to 6% of Station Unit Flow (i.e., 340 cfs) from April 1 to December 31, as river conditions allow, for downstream fish passage.
- Continue to operate the deep canal drain gate (herein referred to as the “forebay deep gate”) next to Unit 1 at an opening of 1.5 feet, to pass approximately 300 cfs, from September 15 to October 31 for 8 hours per night for eel passage.
- Within 2 years of Commission authorization, install a 2-inch trash rack overlay on Unit 7 to prevent turbine entrainment of salmon kelts, and install a uniform acceleration weir at both the fish bypass sluice and forebay surface sluice.

- Consult with Interior, NMFS, and Maine DMR and relocate "if necessary" the existing upstream eelway.
- Implement the Sturgeon Handling Plan to facilitate safe handling of Atlantic or shortnose sturgeon that may be encountered during fish lift operations or in the event of stranding during the replacement of spillway flashboards. Update the plan in consultation with the agencies, if needed, following completion of all new fish passage facilities.
- Update the Fish Passage Operation and Maintenance (O&M) Plan to include procedures for operating all new and modified upstream and downstream fish passage facilities.

Hydro-Kennebec

- Until completion of all new upstream anadromous fishways at the other three projects, continue to operate the existing Hydro-Kennebec fish lift as directed by Maine DMR. This would likely include using camera observations of the fish lift entrance to periodically turn on the facility to collect any salmon that may have passed over the Lockwood spillway during high flows.
- Continue to operate upstream eelways from June 15 to September 15 for eel passage
- To protect downstream migrating smolts, shut down the turbines for 12 hours at night for 4-5 weeks (28-35 days) during the spring to cover 97% of the smolt outmigration (typically beginning the last week of April). The specific start date and duration of the shutdowns in any given year would be determined in consultation with NMFS and Maine DMR.
- Within 2 years of Commission approval, modify the guidance boom and downstream bypass by: (1) extending the guidance boom to close the existing gap between the end of the boom and the surface bypass entrance, (2) increasing the size of the bypass to accommodate 5% of Station Unit Flow (i.e., about 400 cfs), (3) installing a uniform acceleration weir at the bypass entrance, (4) relocating the bypass entrance about 20 feet upstream of its current location near the powerhouse intake to straighten the flume and remove the existing 90 degree turn, and (5) smoothing the bypass flume by removing internal weirs.
- Continue to operate the surface bypass from April 1 to December 31 but increase flow through the bypass to 5% of Station Unit Flow (about 400 cfs).
- Within 2 years of Commission approval, install 2-inch spaced trash rack overlays on the powerhouse intakes to protect kelts.
- Operate the fish lift AWS spillway at a flow of at least 3% of Station Unit Flow (about 240 cfs) from May 1 to October 31 to provide an additional safe downstream passage route during the upstream fish passage season.
- Survey the ledges beneath the spillway for perched pools and modify the ledges as necessary to provide opportunities for fish egress from the pools.

- Update the Fish Passage O&M Plan to include procedures for operating all new and modified upstream and downstream fish passage facilities.

Shawmut

- Continue to operate the project in run-of-river mode with impoundment drawdowns limited to no more than 1 foot to protect aquatic resources.
- Implement the Operations Monitoring Plan filed with the license application to monitor compliance with project operation requirements.
- Construct a new upstream anadromous fish lift with an integrated AWS spillway adjacent to the 1912 Powerhouse to provide swim-through passage past the dam, and a new concrete upstream fish passage flume to provide volitional passage from the 1982 Powerhouse tailrace across an island to the 1912 Powerhouse tailrace so fish can access the new fish lift entrance.
- Operate the upstream anadromous fishways from May 1 to November 10 each year.
- Achieve an adult salmon upstream passage effectiveness standard of 96% within 48 hours of a fish approaching the Shawmut Project.
- Achieve an adult alosine[13] upstream passage effectiveness standard of at least 70% within 48 hours of a fish approaching the Shawmut Project.
- Install an approximately 330-foot-long, 10-foot-deep fish guidance boom upstream of the forebay to direct downstream migrating fish towards the new AWS spillway.
- Operate the fish lift AWS spillway with a flow of 340 cfs from April 15 to December 31 for downstream fish passage.
- Install an approximately 210-foot-long, 10-foot-deep fish guidance boom in the forebay upstream of the 1982 Powerhouse to direct downstream migrating fish that enter the forebay away from the turbines and toward the Tainter and surface sluice gates.
- During the interim period until a new license is issued, continue to lower four sections of hinged flashboards to pass 560 cfs from May 1 to May 31 to provide an additional non-turbine passage route for Atlantic salmon smolts.
- Install trash rack overlays on the intakes for Units 1-6 with 1-inch bar spacing to minimize turbine entrainment of salmon smolts.
- Install trash rack overlays on the intakes for Units 7-8 with 2-inch bar spacing to prevent turbine entrainment of salmon kelts.
- Shut down Units 7 and 8 for 12 hours at night for 4-5 weeks (28-35 days) during the spring to cover 97% of the smolt outmigration (typically beginning the last week of April). The specific start date and duration of the shutdowns in any given year would be determined in consultation with NMFS.
- Resurface the concrete on the hinged flashboard and log sluice spillway sections to improve downstream fish passage survival by smoothing the existing rough surfaces.

[13] Alosines include American shad, blueback herring, and alewife.

- Prioritize spill through the project's spillway sections by operating the eastern-most spillway section as last on first off to minimize potential for downstream migrating fish to strike shallow bedrock beneath the spillway, and to maximize spill attraction toward the new fish lift.
- Extend the concrete spillway for the forebay Tainter and deep gates by about 80 feet to reroute the discharge location of both gates to a new deep plunge pool in the 1982 Powerhouse tailrace.
- After the new fish lift and guidance booms are constructed and tested and the Tainter and deep gate spillway extensions are completed, prioritize operation of the generating units in the 1912 Powerhouse such that Unit 1 is the first on and last off, followed consecutively by Units 2 through 6, from April 1 to December 31 to improve downstream passage survival and increase attraction to the new fish lift entrance.
- Continue to operate the existing forebay surface sluice gate at maximum capacity to pass up to 35 cfs from April 1 to December 31 to provide a continuous surface bypass route in the forebay for downstream migrating fish.
- Install a uniform acceleration weir at the entrance to the forebay Tainter gate to improve attraction and downstream passage survival.
- Continue to spill 600 cfs through the forebay Tainter gate from April 1 to June 15 to provide a safe passage route for Atlantic salmon smolts.
- Continue to provide a total of 6% of Station Unit Flow (about 400 cfs at maximum generation) through the combined discharge of the forebay Tainter and surface sluice gates from November 1 to December 31 to provide a safe passage route for kelts.
- Achieve a smolt downstream survival rate of 97% at the Shawmut Project within 24 hours of a fish approaching the project.
- Achieve an alosine downstream survival rate of 97% within 24 hours of a fish approaching the Shawmut Project.
- After completion and initial operation of the new upstream anadromous fishways, conduct one or two years of siting studies to verify areas where eels congregate below the dam, and then construct up to two volitional eelways.
- Conduct one year of passage effectiveness studies after completion of any required new upstream eelways.
- Operate upstream eelways from June 1 to September 15 each year for eel passage.
- During the interim period between license issuance and construction and initial operation of all new downstream fish passage facilities and measures, shut down all units for 8 hours at night and pass 425 cfs through the forebay deep gate from August 15 to October 31 for downstream eel passage.
- Once all proposed new downstream fish passage facilities and measures have been completed and put into operation, conduct balloon tag and radio telemetry studies to determine eel passage routes and survival rates, and then implement any downstream eel passage measures required by Interior.

- Should Interior require any new downstream eel passage measures, conduct two years of downstream eel effectiveness studies to evaluate eel passage survival rates.
- Develop study plans for the fishway effectiveness testing studies for Atlantic salmon upstream and downstream passage.
- Update the Fish Passage O&M Plan filed with the December 13, 2019, fish lift design drawings, to include procedures for operating all new and modified upstream and downstream fish passage facilities.
- Continue to pass large woody debris that accumulates at the project downstream to enhance aquatic habitat in the Kennebec River.
- Implement the Recreation Facilities Management Plan filed with the license application, which includes provisions for continued maintenance and management of the Hinckley Boat Launch and Shawmut Canoe Portage.
- Implement the Historic Properties Management Plan filed with the license application to protect and preserve cultural resources, which includes conducting Phase II surveys at four pre-contact archaeological sites and the Noble's Ferry West cultural site to determine eligibility for listing on the National Register.

Weston

- Construct a new upstream anadromous fish lift between the South Channel Dam log sluice and the powerhouse.
- Continue to operate and maintain the floating guidance boom for downstream fish passage from April 1 through December 31, as river conditions allow.
- Operate the South Channel Dam log sluice for downstream fish passage as follows:
    - From April 1 to June 15: as ice conditions allow, provide a minimum of 8% of Station Unit Flow for smolt passage.
    - From June 16 to September 14: after the fish lift is constructed and put into operation, or in the event that Maine DMR stocks alosines upstream of the Weston Project, provide a minimum of 6% of Station Unit Flow for alosine passage.
    - From September 15 to October 31: provide a minimum of 6% of Station Unit Flow for 8 hours per night for downstream eel passage.
    - From November 1 to December 31: provide a minimum of 6% of Station Unit Flow, as ice conditions allow for kelt passage.
- Modify the South Channel Dam log sluice to increase passage survival by resurfacing the flume, sealing gaps, and constructing a lip at the downstream end of the sluice to dissipate energy. Additional modifications could be proposed after consultation with NMFS, FWS, and Maine DMR.
- To reduce the potential for downstream migrating fish to strike the bedrock ledges beneath North Channel Dam, within two years of Commission approval, automate the

North Channel Dam left Tainter gate and operate the North Channel Dam spillways according to the following interim priorities: (1) right Obermeyer section (up to a max capacity of 4,450 cfs); (2) left Obermeyer section (up to a max capacity of 4,450 cfs); (3) Center Stanchion top gates (up to a max capacity of 715 cfs); (4) left Tainter gate (up to a maximum capacity of 5,000 cfs); (5) right Tainter gate (up to a maximum capacity of 5,000 cfs); and (6) North Channel Stanchion top gates (up to a maximum capacity of 5,005 cfs).

- Operate the fish lift AWS spillway with a flow of 304 cfs to provide a dedicated downstream fish passage route.
- Continue to operate upstream eelways from June 15 to September 15 for eel passage.
- Within 2 years of Commission approval, install new trash rack overlays with 2-inch clear bar spacing on the powerhouse intake to protect downstream migrating kelts.
- Within one year of Commission approval, conduct a balloon tag study to confirm the proposed interim gate prioritization measures maximize spill survival for salmon smolts.
- Develop a fish passage O&M plan with procedures for operating all upstream and downstream fish passage facilities.

Lockwood, Hydro-Kennebec, and Weston

- Attempt to achieve a target adult salmon upstream passage effectiveness standard of 96% within 48 hours of a fish approaching each project, in order to achieve a cumulative upstream effectiveness standard of 84.9% within 192 hours at all four projects.
- Once completed and put into permanent operation, operate all anadromous upstream fishways from May 1 to October 31.
- Attempt to achieve a target smolt downstream passage effectiveness standard of 97% within 24 hours of a fish approaching each project, in order to achieve a cumulative downstream effectiveness standard of 88.5% and a cumulative residence time of 96 hours at all four projects.
- Ensure that up to 250,000 hatchery smolts are stocked upstream of the Weston Project for up to six years to provide a return of 200 adult salmon for use in fishway effectiveness testing at the four projects.

Lockwood, Hydro-Kennebec, Shawmut, and Weston

- Once all new fishways at the four projects are constructed and put into operation for one year, conduct up to two years of qualitative passage effectiveness studies using up to 20 adult salmon to evaluate the performance of the new fishways.
- Once all new fishways are constructed and put into operation at all four projects and sufficient numbers of returning adult salmon are available (i.e., about 200 fish of Kennebec origin), conduct a quantitative adult salmon upstream passage study for at least

one year to evaluate the cumulative upstream passage effectiveness of the fish passage facilities at the four projects.

- Once the quantitative upstream passage effectiveness study is completed and has demonstrated that the projects are achieving the Atlantic salmon upstream passage effectiveness standards, conduct one additional year of testing every 10 years to verify that the projects are continuing to achieve passage standards and incidental take limits in the NMFS BO.
- Once all new proposed downstream fishways are constructed, conduct up to three years of studies to determine whether the projects are meeting smolt downstream passage effectiveness standards.
- Once the downstream passage studies are complete and have demonstrated that the projects are achieving the smolt downstream passage effectiveness standards, conduct one additional year of testing every 10 years to verify that the projects are continuing to achieve the smolt passage standards and incidental take limits in the NMFS BO.
- Develop adaptive management measures, if needed, to improve upstream and downstream passage effectiveness to achieve performance standards.

Additional Measures Recommended from the FEIS Staff Alternative with Mandatory Conditions

Lockwood

- Extend the potential duration of spring turbine shutdowns for smolt passage up to 54 days to ensure shutdowns occur when at least 97% of the smolt run is migrating (instead of 28-35 days as proposed).
- Extend the proposed operation of the forebay deep gate at night for eel passage by an additional 31 days to encompass the entire eel outmigration from August 15 to October 31 (instead of September 15 to October 31 as proposed).
- Begin operation of upstream eelways on June 1 to align with the upstream migration period for eels in the Kennebec River (instead of June 15 as proposed).
- Modify the Lockwood Fish Passage O&M Plan as follows: (1) include procedures for consulting with NMFS and Maine DMR in setting the annual turbine shutdown schedule for smolts; (2) include a provision for notifying the Commission of the shutdown schedule, for administrative purposes, by filing a copy of the shutdown schedule after the annual smolt passage season; (3) include procedures for monitoring and reporting compliance with all fish passage operation measures; and (4) remove the fish stranding measures in section 5 of the plan.
- Continue to operate the Lockwood fish lift after completion of the new vertical slot fishway (instead of consulting with the agencies and potentially discontinuing its operation as proposed).
- After all new upstream and downstream fishways are constructed and testing shows that they are meeting salmon passage standards, develop a plan for Commission approval

with any proposals and agency recommendations for long-term operation of the fish lift as a swim-through or a trap and haul facility.

Hydro-Kennebec

- Extend the potential duration of spring turbine shutdowns for smolt passage up to 54 days to ensure they occur when at least 97% of the smolt run is migrating (instead of 28-35 days as proposed).
- Revise the Fish Passage O&M Plan to include: (1) procedures for consulting with NMFS and Maine DMR in setting the annual turbine shutdown schedule for smolts; (2) a provision for notifying the Commission of the shutdown schedule, for administrative purposes, by filing a copy of the shutdown schedule after the annual smolt passage season; and (3) procedures for monitoring and reporting compliance with all fish passage operation measures.
- Begin operation of upstream eelways on June 1 to align with the upstream migration period for eels in the Kennebec River (instead of June 15 as proposed).
- Shut down all turbines for 8 hours at night from August 15 to October 31 to protect downstream-migrating eels (instead of no shutdowns as proposed).

Shawmut

- Extend the potential duration of spring turbine shutdowns for smolt passage up to 54 days to ensure they occur when at least 97% of the smolt run is migrating (instead of 28-35 days as proposed).
- Operate the forebay Tainter gate at a flow equal to 5% of Station Unit Flow (about 200 cfs) from June 16 to October 31 for downstream alosine passage (instead of shutting it down during this period as proposed).
- Revise the Fish Passage O&M Plan to include: (1) procedures for consulting with NMFS and Maine DMR in setting the annual turbine shutdown schedule for smolts, and (2) a provision for notifying the Commission of the schedule, for administrative purposes, by filing a copy of the schedule after the annual smolt passage season.
- Revise the Operations Monitoring Plan to include: a detailed description of how the licensee would monitor compliance with the operating requirements of the license, procedures for maintaining and calibrating all monitoring equipment, and revised reporting procedures that include reporting requirements for all deviations from the operational requirements of the license.
- After construction of the new upstream anadromous fishways and an initial “one-year shakedown” operation period, conduct one year of siting studies to verify that eels continue to congregate near the location of existing upstream eelways (instead of up to two years of siting studies as proposed).

- Conduct one year of monitoring of the size of juvenile eels using any new upstream eelways to verify that the eelway substrate is the appropriate size to pass all sizes of juvenile eels at the project and prepare a report with any proposals and agency recommendations to modify the substrate based on the monitoring results (instead of no eel size testing of eelways as proposed).
- Shut down Units 7-8 at night and spill 425 cfs through the forebay deep gate from August 15 to October 31 for downstream eel passage throughout the term of the new license (rather than shutting down all units during the interim period between license issuance and the completion of all new fish passage facilities, conducting additional post-licensing balloon and radio tag studies of downstream eel survival, implementing and new fish passage measures required by Interior, and then testing the effectiveness of the new measures).
- Revise the RFMP to designate the Hinckley Boat Launch and Shawmut Canoe Portage as project facilities and include a description of the methods that would be used to monitor recreational use every ten years, how monitoring results would be shared with resource agencies, and a schedule for conducting monitoring and filing results with the Commission for approval.

Weston

- Extend the operation of the new upstream fish lift to November 10 for Atlantic salmon passage (instead of October 31 as proposed).
- Begin operation of upstream eelways on June 1 to align with the upstream migration period for eels in the Kennebec River (instead of June 15 as proposed).
- Prepare a report, for Commission approval, that includes the results of the proposed spillway balloon tag study and any proposals or agency recommendations for long-term spillway operations to maximize smolt survival.
- Include in the proposed fish passage O&M plan procedures for monitoring and reporting compliance with all fish passage operation measures.

Lockwood, Hydro-Kennebec, Shawmut, and Weston

- Operate all upstream anadromous fishways 24 hours per day from May 1 to June 30 for sea lamprey passage.
- Include in the fish passage O&M plan for each project: (1) an updated operating schedule for all fish passage facilities that aligns with the mandatory fishway prescriptions for Shawmut, and Brookfield's updated Proposed Actions for all four projects as set forth in its September 21, 2022 filing; (2) specific procedures for annually consulting with Maine DMR, FWS, and NMFS in setting the fish lift operating hours and lift cycle frequency at each project; (3) a provision for notifying the Commission of the operating hours and lift cycle frequency at each project, for administrative purposes, by filing a copy of the

schedule prior to the annual passage season; and (4) procedures for operating fishways during emergencies and project outages.

- Develop a fish stranding and rescue plan for the four projects that includes: (1) a schedule and procedures for monitoring, handling, and rescuing listed fish from the ledges beneath the spillways; (2) criteria for deciding if and when modifications to the ledges would be required; and (3) provisions to notify the Commission of the monitoring results and any proposals for Commission approval to modify the ledges or discontinue monitoring based on the monitoring results. • Implement the construction BMPs listed in Maine DEP's WQC for construction of the Lockwood fishway access road, for all authorized project construction activities involving land disturbances at the Weston Project.
- Provide 30%, 60%, and 90% fish passage facility design drawings to Maine DMR, FWS, and NMFS for review and comment.
- Develop an adaptive management and monitoring plan that includes: (1) procedures for fishway effectiveness testing, (2) a description of a hatchery salmon stocking program to use in effectiveness testing, and (3) a framework and schedule for identifying and selecting adaptive management measures if Brookfield fails to achieve salmon passage effectiveness standards at any of the projects.
- Avoid any tree-cutting and trimming from April 15 through October 31 to protect the Northern long-eared bat, unless the trees represent a public safety hazard.
- Minimize effects on the public from blasting by including the following provisions in any blasting plan prepared for fishway construction: (1) protocols for increased outreach, scheduling, and providing advanced notification of blasting to communities at the Lockwood Project,181 including residents and the school nearby; (2) identification of a project point of contact for community members to direct questions, comments, and concerns throughout the licensing process; (3) measures to limit dust and control fly rock, and (4) limiting blasting to between the hours of 9 a.m. and 3 p.m. Monday through Saturday, and no blasting on holidays.
- Limit construction activities to the hours of 7 a.m. to 7 p.m. Monday through Saturday to prevent elevated noise levels at night and on Sundays.

II. JURISDICTION

The proposed continued operation of the Shawmut Project and changes to operation of the Lockwood, Hydro-Kennebec, and Weston Projects resulting from implementation of the Kennebec Species Protection Plan qualify as an "activity…which may result in [a] discharge into the navigable waters [of the United States]" under Section 401 of the CWA. 33 U.S.C. § 1341(a). Section 401 requires that any applicant for a federal license or permit to conduct such an activity must obtain a certification that the discharge will comply with applicable State water quality standards. *Id.* State law authorizes the Department to issue a WQC pursuant to Section 401 of the CWA when the continued

operation of a project will maintain the standards of classification for the affected water bodies, including the State's antidegradation policy. 38 M.R.S. § 464(4)(F)(3).

State WQC for the Lockwood Project was last issued by the Department on August 26, 2004. State WQC for the Hydro Kennebec Project was last issued on June 6, 1986, and modified on February 24, 1988, and August 4, 1998. State WQC for the Weston Project was last issued on November 17, 1992, and modified on February 26, 1996, and August 4, 1998. State WQC for the Shawmut Project was last issued by the Department on November 17, 1992, and modified on August 4, 1998. The Department issued a denial without prejudice of Brookfield's WQC application on October 12, 2022.

Under a 1996 Executive Order of the Governor of the State of Maine, the Department is designated as the certifying agency for issuance of Section 401 WQC for all activities in the State not subject to Land Use Planning Commission permitting and review. [14] Therefore, the Department is the certifying agency for the Projects.

The Lockwood, Hydro Kennebec, Shawmut, and Weston Projects are licensed by FERC as hydropower projects under the Federal Power Act (FERC Project Nos. 2574, 2611, 2322 & 2325). Relicensing for the Shawmut Project and license amendments for the Lockwood, Hydro Kennebec, and Weston Projects are currently pending with FERC.

On September 12, 2024, FERC requested that the Applicant provide any correspondence with the Department regarding the need for WQCs at the Lockwood, Hydro Kennebec, and Weston Projects. The letter stated, "[g]iven the proposed changes associated with he construction and operation of the fish passage facilities and the potential change in project discharge, a WQC for each of the projects may be required for the Amendments." On October 16, 2024, the Department sent a letter in response to FERC, stating that the Department anticipated a cumulative WQC for the Lockwood, Hydro Kennebec, Shawmut, and Weston Projects to address the activities evaluated in the cumulative Environmental Impact Statement.

The original FERC license for the Shawmut Project was issued on March 5, 1964;[15] the most recent FERC license was issued January 5, 1981, for a term of 40 years, expiring on January 31, 2021. Brookfield has filed an Application for New License with FERC to continue to operate the project for another 40 years. That application is currently pending before FERC.

[14] Executive Order No. 3 FY 96/97.
[15] The original FERC license was issued on March 5, 1964, with a retroactive effective date of June 1, 1954.

III. APPLICABLE STATE WATER QUALITY STANDARDS

A. Lockwood, Hydro Kennebec, and Weston Projects

1. Classification

The Kennebec River where the Lockwood and Hydro Kennebec Projects are located is designated as both Class C and Class B. From the Shawmut Dam downstream to its confluence with Messalonskee Stream, excluding all impoundments, the waters of the river are Class B. 38 M.R.S. § 467(4)(A)(10-A). Waters impounded by the Hydro-Kennebec Dam and the Lockwood Dam in Waterville-Winslow are Class C. 38 M.R.S. § 467(4)(A)(10-A)(a).

The Kennebec River where the Weston Project is located is designated as Class B. 38 M.R.S. § 467(4)(A)(9).

2. Designated Uses

The Applicant must demonstrate that the applications for the Lockwood and Hydro Kennebec Projects meet Class C above the dams in the impoundments and Class B in the Kennebec River below the dams for the standards and designated uses as described below:

> Class B waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as habitat for fish and other aquatic life. The habitat must be characterized as unimpaired. 38 M.R.S. § 465(3)(A).

> Class C waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, Section 403; navigation; and as a habitat for fish and other aquatic life. 38 M.R.S. § 465(4)(A).

The Applicant must demonstrate that the application for the Weston Project meets Class B water classification standards and designated uses for the impoundment and Kennebec River below the dam as described below:

> Class B waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as habitat for fish and other aquatic life. The habitat must be characterized as unimpaired. 38 M.R.S. § 465(3)(A).

3. Numeric Standards

The license amendments for the Lockwood, Hydro-Kennebec, and Weston Projects are not anticipated to impact numeric water quality standards, and therefore no information regarding numeric standards will be considered in this certification.

4. Narrative Standards

The Applicant must demonstrate that its applications for the Lockwood and Hydro Kennebec Projects meet the following Class C narrative criteria above the dams in the impoundments and Class B narrative criteria in the Kennebec River below the dams:

> Discharges to Class C waters may cause some changes to aquatic life, except that the receiving waters must be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community. 38 M.R.S. § 465(4)(C).
>
> Discharges to Class B waters may not cause adverse impact to aquatic life in that the receiving waters must be of sufficient quality to support all aquatic species indigenous to the receiving water without detrimental changes in the resident biological community. 38 M.R.S. § 465(3)(C).

Hydropower facilities managed under riverine classifications under 38 M.R.S. § 465 are additionally subject to 38 M.R.S. § 464(10) in

> recognition of the fact that some changes to aquatic life and habitat have occurred due to the existing impoundments of these projects. Under § 464(10), Class B riverine impoundments are generally deemed to meet classification standards if the aquatic life and habitat in those impounded waters achieve Class C aquatic life criteria found at 38 M.R.S. § 465(4)(C), provided that no changes can be made to improve such habitat that does not significantly affect existing energy generation capability. 38 M.R.S. § 465(4)(10).

The Applicant must demonstrate that the application for the Weston Project meets the following Class B narrative criteria above the dams in the impoundment and in the Kennebec River below the dam:

> Discharges to Class B waters may not cause adverse impact to aquatic life in that the receiving waters must be of sufficient quality to support all aquatic species indigenous to the receiving water without detrimental changes in the resident biological community. 38 M.R.S. § 465(3)(C).

Hydropower facilities managed under riverine classifications under 38 M.R.S. § 465 are additionally subject to 38 M.R.S. § 464(10) in recognition of the fact that some changes to aquatic life and habitat have occurred due to the existing impoundments of these projects. Under § 464(10), Class B riverine impoundments are generally deemed to meet classification standards if the aquatic life and habitat in those impounded waters achieve Class C aquatic life criteria found at 38 M.R.S. § 465(4)(C), provided that no changes can be made to improve such habitat that does not significantly affect existing energy generation capability. 38 M.R.S. § 465(4)(10).

5. Antidegradation

The Department may only approve WQC if the standards of classification of the water body and the requirements of the State's anti-degradation policy are met. The Department may approve WQC for a project affecting a water body in which the standards of classification are not met if the project does not cause or contribute to the failure of the water body to meet the standards of classification. 38 M.R.S. § 464 (4)(F)(3).

B. Shawmut Project

1. Classification

The Kennebec River where the Project is located is designated as both Class C and Class B. Traveling downstream, one Class B classification extends from the Route 201A bridge in Anson-Madison to the Fairfield-Skowhegan boundary, including all impoundments. 38 M.R.S. § 467(4)(A)(9). The upper portion of the Shawmut impoundment extends into this Class B section of the river. Then, from the Fairfield-Skowhegan boundary to the Shawmut Dam, a section of the river that is entirely a riverine impoundment, the waters are Class C. 38 M.R.S. § 467(4)(A)(10). Finally, from the Shawmut Dam downstream to its confluence with Messalonskee Stream, excluding all impoundments, the waters of the river are Class B. 38 M.R.S. § 467(4)(A)(10-A).

2. Designated Uses

The Applicant must demonstrate that the Kennebec River, including the Shawmut impoundment and the section of the river below the Shawmut Dam, meets the applicable designated uses. The Class B and Class C waters of the Kennebec River in the vicinity of the Shawmut Project must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as habitat for fish and other aquatic life. 38 M.R.S. § 465(3)(A); 38 M.R.S. § 465(4)(A). Additionally, habitat in Class B waters must be characterized as unimpaired. 38 M.R.S. § 465(3)(A).

3. Numeric Standards

The Applicant must demonstrate that the Kennebec River above and below the Shawmut Project meets the following numeric criteria:

> The dissolved oxygen content of Class B waters may not be less than 7 parts per million or 75% of saturation, whichever is higher, except that for the period from October 1st to May 14th, in order to ensure spawning and egg incubation of indigenous fish species, the 7-day mean dissolved oxygen concentration may not be less than 9.5 parts per million and the

one-day minimum dissolved oxygen concentration may not be less than 8.0 parts per million in identified fish spawning areas. Between April 15th and October 31st, the number of Escherichia coli bacteria in these waters may not exceed a geometric mean of 64 CFU or MPN per 100 milliliters over a 90-day interval or 236 CFU or MPN per 100 milliliters in more than 10% of the samples in any 90-day interval. 38 M.R.S. § 465(3)(B).

The dissolved oxygen content of Class C water may not be less than 5 parts per million or 60% of saturation, whichever is higher, except that in identified salmonid spawning areas where water quality is sufficient to ensure spawning, egg incubation and survival of early life stages, that water quality sufficient for these purposes must be maintained. In order to provide additional protection for the growth of indigenous fish, the following standards apply. 38 M.R.S. § 465(4)(B)

a. The 30-day average dissolved oxygen criterion of a Class C water is 6.5 parts per million using a temperature of 22 degrees centigrade or the ambient temperature of the water body, whichever is less, if:
    i. A license or water quality certificate other than a general permit was issued prior to March 16, 2004 for the Class C water and was not based on a 6.5 parts per million 30-day average dissolved oxygen criterion; or
    ii. A discharge or a hydropower project was in existence on March 16, 2005 and required but did not have a license or water quality certificate other than a general permit for the Class C water.

    This criterion for the water body applies to licenses and water quality certificates issued on or after March 16, 2004.
b. In Class C waters not governed by subparagraph (1), dissolved oxygen may not be less than 6.5 parts per million as a 30-day average based upon a temperature of 24 degrees centigrade or the ambient temperature of the water body, whichever is less. This criterion for the water body applies to licenses and water quality certificates issued on or after March 16, 2004.

4. Narrative Standards

The Applicant must demonstrate that the Kennebec River above and below the Shawmut Project meets the following narrative Class B criteria:

Discharges to Class B waters may not cause adverse impact to aquatic life in that the receiving waters must be of sufficient quality to support all aquatic species indigenous to the receiving water without detrimental changes in the resident biological community. 38 M.R.S. § 465(3)(C).

Hydropower facilities managed under riverine classifications under 38 M.R.S. § 465 are additionally subject to 38 M.R.S. § 464(10) in recognition of the fact that some changes to aquatic life and habitat have occurred due to the existing impoundments of these projects. Under § 464(10), Class B riverine impoundments are generally deemed to meet classification standards if the aquatic life and habitat in those impounded waters achieve Class C aquatic life criteria found at 38 M.R.S. § 465(4)(C), provided that no changes can be made to improve such habitat that does not significantly affect existing energy generation capability. 38 M.R.S. § 465(4)(10).

5. Antidegradation

The Department may only approve WQC if the standards of classification of the water body and the requirements of the State's anti-degradation policy are met. The Department may approve WQC for a project affecting a water body in which the standards of classification are not met if the project does not cause or contribute to the failure of the water body to meet the standards of classification. 38 M.R.S. § 464 (4)(F)(3).

C. Department Rules

Attainment of water quality standards is assessed through application of the following Department Rules:

1) 06-096 Chapter 579: Classification Attainment Evaluation Using Biological Criteria for Rivers and Streams.

Criteria to quantify aquatic life standards for Classes AA, A, B, and C waters are defined in this chapter. The benthic macroinvertebrate community is used as a surrogate to determine conformance with statutory aquatic life standards, related statutory definitions, and statutory provisions for the implementation of biological water quality criteria that are provided in Maine's standards for classification of fresh surface waters. Methods described in this chapter are used to make decisions about classification attainment.

2) 06-096 Chapter 580: Regulations Relating to Sampling Procedures and Analytical Procedures.

This rule establishes standards whereby all sampling and analysis is performed according to accepted technical procedures for chemical and biological analysis.

3) 06-096 Chapter 581: Regulations Relating to Water quality Evaluations.

This rule, among other things, provides for the maintenance of water classifications by computing the assimilative capacity of the waters to break down waste and provides for the maintenance of zones of passage for free-swimming and drifting organisms.

IV. DEPARTMENT ANALYSIS

This certification evaluates the application for relicensing of the Shawmut Project; accordingly, all water quality sections are addressed below for the Shawmut Project. In contrast, the Lockwood, Hydro Kennebec, and Weston Project license amendments pertain to the implementation of the Kennebec Species Protection Plan and are therefore assessed solely for compliance with applicable aquatic habitat and aquatic life criteria for fish passage.

A. Aquatic Habitat and Aquatic Life (38 M.R.S. § 465(3)(A), (C); § 465(4)(A), (C))

The Applicant must demonstrate that the Shawmut impoundment and the Kennebec River below the dam is suitable for the designated use of habitat for fish and other aquatic life. Conformance with the aquatic habitat designated use is determined by methods described in the Department's *Hydropower Project Flow and Water Level Policy*, dated February 4, 2002 (Water Level Policy). Under this policy guidance, the Department operates under the rebuttable presumption that a flow that provides wetted conditions in a weighted average of 3/4ths of the cross-sectional area of the affected river or stream, as measured from bank full conditions, or a water level that provides wetted conditions for 3/4ths of the littoral zone[16] of a lake or pond, as measured from full pond conditions, is

[16] The "littoral zone" of lakes and lake-like water bodies is defined in limnology as the portion of a lake where light penetration allows plant growth on the bottom. The littoral zone extends from the shoreline to the maximum depth where plants on the bottom receive enough sunlight for photosynthesis. This depth, known as the euphotic zone, is commonly estimated as the depth that receives approximately 1% of incident light (Cole, 1979) (or 78? See below). While depth of the zone varies with many factors, it can be estimated as a multiple of the Secchi disk transparency (SDT). Based on Tyler (1968), for more than 20 years the Department has delineated the littoral zone using a depth two times the SDT for purposes of determining attainment of Maine's Water Quality Standards.
Cole, GA. (1978) *Textbook of Limnology*, 2nd Ed. 165, St. Louis, MO.

needed to meet aquatic life and habitat standards. On a case-by-case basis, the Department may approve alternative flows or water levels under circumstances defined in the Water Level Policy, where the alternative flows or water levels can be shown to meet all applicable water quality standards.

The Applicant also must demonstrate that the Kennebec River is of sufficient quality to support all species of fish indigenous to the receiving waters and to maintain the structure and function of the resident biological community in accordance with applicable narrative and numeric aquatic life standards. The resident biological community means aquatic life expected to exist in a habitat that is free from the influence of the discharge. 38 M.R.S. § 466(10). The habitat below the Lower Kennebec Dams must also be characterized as unimpaired.

The resident biological community may be established by accepted biomonitoring techniques. 38 M.R.S. § 466(10). Accepted biomonitoring techniques with respect to rivers and streams are established in Department rule, 06-096 C.M.R. ch. 579, *Classification Attainment Evaluation Using Biological Criteria for Rivers and Streams* (effective May 27, 2003) (Chapter 579). Criteria to quantify aquatic life standards for Class AA, A, B, and C waters use the benthic macroinvertebrate community as a surrogate to determine classification attainment. Chapter 579 addresses how benthic macroinvertebrate samples must be collected and the process for analyzing these samples using the linear discriminant model to evaluate whether the sampled river or stream is in attainment. The selection of sampling sites, as well as data collection and processing, must be in conformance with the Department's Methods for Biological Sampling and Analysis of Maine's Rivers and Streams. 06-096 C.M.R. ch. 579, § 3(A).

To ensure the Kennebec River is of sufficient quality to support all species of fish indigenous to the receiving waters and to maintain the structure and function of the resident biological community, the Applicant must also demonstrate that the relicensing of the Shawmut Project and implementation of the Kennebec Species Protection Plan at the Lockwood, Hydro Kennebec, and Weston Projects provides for safe, timely, and effective fish passage consistent with applicable aquatic habitat and life standards.

1) Aquatic Habitat and Aquatic Life – Shawmut Riverine Impoundment (38 M.R.S. § 465(3)(A), (C); 38 M.R.S. § 465(4)(A), (C); 38 M.R.S. § 464(10))

    a. Existing Habitat and Resources

Tyler, JE. (1968) *The Secchi disk, Limnology and Oceanography* 13(1): 1-6.

The Shawmut riverine impoundment extends approximately 12 miles upstream of the Project Dam and has a surface area of 1,320 acres at a normal full pond elevation of 112.0 feet. The Project is operated as a run-of-river facility and the impoundment is managed to maintain water level elevations within one foot of the normal full pond elevation during normal operations. Minor, temporary changes to downstream flow occur as a result of the opening or closing of gates or lowering of the rubber bladder section(s) or flashboards to manage variable river flows as needed to maintain the impoundment water level, for Project maintenance, or for resource protection measures such as nightly shutdowns during downstream passage of American eels. The Applicant submitted historic flow and reservoir level data as evidence that normal Project operations do not result in impoundment water level fluctuations that dewater the littoral zone. A desktop analysis of hourly impoundment elevation variations below the normal full pond impoundment level between January 2010 and December 2015 showed that deviations occur infrequently; deviations of 0.5 foot or more occurred approximately 4% of the time and deviations of 1 foot or more occurred 1% of the time during that six-year period.

The Department finds that the run-of-river operations provide a relatively stable head pond elevation while passing inflows. Such operations protect existing littoral habitats from changes related to water level fluctuations and maintain connectivity to tributaries. Three small tributaries (Wesserunsett, Martin, and Carrabassett streams) discharge into the mainstem river upstream of the Shawmut Dam. Riverbanks are steep-sided and bordered by rolling hills near Skowhegan, flattening into broad floodplains on the east bank with a few steep slopes on the west bank as the river flows south to the village of Shawmut. The river averages 750 feet wide, with an average depth of approximately 20 feet. The Shawmut impoundment is approximately 1,800 feet wide and approximately 30 feet deep near the Project Dam. Shorelines contain typical shoreline littoral habitats including mud flats, tributary deltas, islands, and submerged aquatic vegetation beds. Substrates in the upper end of the impoundment are primarily large gravels and cobbles with some interspersed fine sediment; the middle and lower reaches are deeper and contain more fine-grained substrates including sands, silts, and clay.

b. Studies

A Tributary Access Study was conducted by the Applicant to evaluate the connectivity between the mainstem of the Kennebec River and tributary streams when impounded water levels are lowered to elevation 108.0 feet (permanent spillway crest elevation) for maintenance work on the dam. A bathymetric survey was conducted using a boat-mounted Lowrance Elite 7 depth sounder and global positioning system (GPS) at full head pond conditions to collect depths along longitudinal transects from the mouth of

each stream extending upstream to the transition from low-gradient backwater or flatwater to free-flowing riverine reaches. At the intersection of the riverine reaches and in shallow locations, additional water depths were collected with a stadia survey rod. A second survey was conducted at head pond elevation 110.9 feet, representing normal operations within one foot of full pond, and a third survey conducted at water elevation 109.1, representing water elevations during maintenance work. Based on the results of the Tributary Access Study, the Department finds that fish access to tributary habitat is not affected by normal operations and no velocity barriers were identified that would prevent fish from accessing the streams. Water depth just upstream of the Carrabassett Stream inlet was determined to be less than a foot at the lowest head pond elevation surveyed, but the Applicant reports that adjacent areas provided deeper channels for fish to access the free-flowing tributaries.

The Applicant completed an Impoundment Trophic State Study in 2016 in accordance with the Department's *Sampling Protocol for Hydropower Studies* (2014) to determine the extent to which Project operations may affect the littoral zone and to assess the ability of the riverine impoundments to support habitat for fish and other aquatic life. The Applicant completed a reconnaissance-level bathymetry survey prior to collecting the first lake trophic sample to identify the deepest, safely accessible spot in the Shawmut impoundment. That spot was approximately 9 meters (m) deep, located approximately 230 m upstream of the dam.

Secchi disk transparency (SDT), dissolved oxygen (DO), temperature, and water chemistry data were collected twice monthly from June through October 2016. The depth of the lake trophic core samples varied between 6 m and 9 m depending on the depth of the epilimnion, which was determined by the water temperature and DO profile; most samples were collected to a depth of 8 m.

Sample parameters included SDT, water temperature, and DO profiles at 1-meter intervals, and epilimnetic core[17] samples of total phosphorous, Chlorophyll-*a*, color, pH, and total alkalinity. Additional nutrient and dissolved metal samples were collected during the late summer sampling event on August 15, 2019. The additional late summer sample parameters included nitrate, dissolved organic carbon (DOC), total iron, total dissolved aluminum, total calcium, total magnesium, total sodium, total potassium, specific conductance, chloride, and sulfate. The late season sample was collected from an integrated epilimnetic core because the water column was not thermally stratified.

[17] The epilimnetic zone is determined by establishing a temperature profile at 1-meter increments to define the epilimnion as the upper layer where the change in temperature per meter of depth is less than 1 degree Celsius.

Total phosphorus in the Shawmut impoundment ranged from 0.011 milligrams per liter (mg/L) to 0.021 mg/L, with an average of 0.016 mg/L. Color ranged from 18 platinum cobalt units (PCU) to 36 PCU, with an average of 29.3 PCU. Chlorophyll-*a* ranged from 0.0016 mg/L to 0.0090 mg/L, with an average of 0.0034 mg/L. Chlorophyll-a was above the proposed state standard of 0.008 mg/L in the sample collected on September 22, 2016; excluding this sample, the maximum chlorophyll-a was 0.0049 mg/L and the average was 0.0028 mg/L. The SDT at the deep spot in the Shawmut impoundment ranged from 2.6 meters to 4.4 meters, with an average of 3.8 meters. Using the average Chlorophyll-*a* concentration for the entire sampling period (0.0034 mg/L), the Trophic State Index (TSI) for the Shawmut impoundment is 43, which is categorized as mesotrophic.

The Applicant measured DO concentrations twice each month between June 6, 2016, and October 18, 2016, in the Shawmut impoundment as part of its Trophic State Study. River flows ranged from 1,360 cfs to 8,980 cfs during the study period and were below the median daily value throughout most of the study period. The average air temperature was approximately 17.8ºC to 21.1ºC, approximately 1 ºC to 4 º C above normal. Water temperatures ranged from 18.0 ºC to 28.4 ºC near the surface and averaged 13.9 º C throughout the water column. DO concentrations ranged from 1.4 mg/L to 9.7 mg/L. Low DO measurements collected near the bottom of the impoundment on June 21, June 30, and July 27, 2016, represented stratified conditions. DO concentrations measured in the impoundment above the point of stratification ranged from 7.07 mg/L to 9.71 mg/L. On September 8, 2016, a single measurement of 6.8 mg/L was collected at a depth of 8 m in unstratified waters in the impoundment, demonstrating that all the water samples met Class C criteria for DO and met Class B water quality standards for DO most of the time in the Class C portion of the impoundment. DO percent saturation was found to be greater than 75%, except below the point of stratification in stratified waters. The Department's Division of Environmental Analysis (DEA) reviewed data submitted by the Applicant and determined that a single DO excursion occurred below the impoundment's thermocline on June 30, 2016, when there was sufficient thermal refuge in waters above the thermocline (temperature < 24 ºC). Further, DEA determined that the Shawmut project did not cause or contribute to the DO excursions.

c. Discussion and Findings

The Department finds that Project operations maintain relatively stable water levels with minimal impoundment fluctuation from full pond conditions, subject only to natural variations related to precipitation events. The Applicant demonstrated this by providing discharge and impoundment water level data. Therefore, the Project maintains 75% of the littoral zone in wetted conditions as measured from full pond, protecting habitat in the littoral zone.

Based on the sampling results and information contained in the WQC application, the Project impoundment meets applicable Class A water quality standards and is free of culturally induced algal blooms. Trophic data indicate that the waters are in the mesotrophic range. See Section 4(B) below for further discussion of DO.

Except for fish passage, which is discussed separately below in Section 4(A)(3), based on the evidence provided by the Applicant, the Department, applying its best professional judgment through application of its Water Level Policy, determines that the riverine impoundment meets the applicable aquatic life and habitat criteria.

2) Aquatic Habitat and Aquatic Life – Shawmut Project Outlet Stream (M.R.S. § 465(3)(A), (C))

To meet Class B aquatic life standards in the riverine outlet waters, the Applicant must demonstrate three things. First, the Applicant must show that the benthic macroinvertebrate community attains aquatic life standards contained in the Department's Chapter 579 rule. The benthic macroinvertebrate community is an indicator of the general state of aquatic life for the purpose of demonstrating attainment of outlet stream aquatic life classification standards.

Second, the Applicant must show that the flow of water in the Kennebec River is sufficient to support the designated use of habitat for fish and other aquatic life and that the habitat is characterized as unimpaired. The Department generally presumes, absent evidence to the contrary, that flow providing wetted conditions for at least 75% of the cross-sectional area of the affected river or stream, as measured from bankfull conditions, is necessary to meet aquatic life and habitat standards. The Applicant can demonstrate attainment of these standards by providing evidence that 75% of the cross-section of the outlet stream is wetted at all times. This rebuttable presumption, as developed through the exercise of the Department's professional experience, expertise, and judgment is also reflected in the Department's Water Level Policy.

Third, because aquatic species indigenous to the Kennebec River include diadromous fish, the Applicant must demonstrate that the water flowing through and over the Lower Kennebec Dams, which discharge into the Kennebec River, support indigenous species and do not cause adverse impacts to aquatic life. This requires showing that discharge from the dams supports safe, timely, and effective fish passage, which is necessary to avoiding detrimental changes in the resident biological community. This standard is discussed below in Section 4(A)(3).

a. Existing Habitat and Resources

The Lower Kennebec River in the Shawmut Project area supports runs of diadromous fish species, including American shad, alewife, blueback herring, Atlantic salmon, and American eel. Atlantic sturgeon and shortnose sturgeon occur in the Lower Kennebec River but not within the Shawmut Project boundary.

The tailwater area below the Shawmut Dam is approximately 1,000 feet wide. The river in this area is shallow, with several bedrock shoals, cobble, and boulder beds, and riffle habitat. The normal tailwater elevation is 88.0 feet. There is no appreciable bypass reach; the generating units are essentially in line with the dam.

b. Studies

The Applicant completed a Benthic Macroinvertebrate Study[18] between August 11 and September 7, 2016, to assess whether current in-stream flow releases affect attainment of aquatic life criteria in the Kennebec River downstream of the Project dam. The study deployed three rock baskets at two sampling locations in the Kennebec River downstream of the Project dam in accordance with the Department's sampling protocol. Department staff analyzed resulting data using the Department's linear discriminant model and found that one site met aquatic life criteria for Class A and the second site met aquatic life criteria for Class B. Therefore, the Kennebec River downstream of the Shawmut Dam meets Class B aquatic life criteria. Additionally, the Applicant submitted Project water level and flow data that indicate that the Project operates in run-of-river mode.

c. Applicant's Proposal

The Applicant proposes to continue to operate the Project in run-of-river mode.

[18] The field and laboratory procedures in this study were conducted using the Department's *Methods for Biological Sampling and Analysis of Maine's Inland Waters* (Davies and Tsomides, revised 2014).

d. Discussion and Findings

The study conducted by the Applicant demonstrates, and the Department finds, that the existing Project flow regime maintains and supports habitat for aquatic species in the Kennebec River downstream of the Project dam.

The Department finds that the sample sites submitted for the Benthic Macroinvertebrate Study meet Class B standards for aquatic life. The Applicant demonstrated through the Benthic Macroinvertebrate Study, and the Department determined using its linear discriminant model, that the benthic community downstream of the Project meets Class B aquatic life criteria.

Based on the water level and flow data provided by the Applicant demonstrating that the Project is operated in run-of-river mode, the Department finds that the Project maintains at least 75% stream wetted width, which provides wetted conditions sufficient to meet aquatic habitat criteria in the Kennebec River. Except for fish passage, which is discussed separately below in Section 4(A)(3), based on the evidence provided by the Applicant, the Department, applying Chapter 579 and its best professional judgment through application of its Water Level Policy, determines that the area downstream of the Project dam meets the applicable aquatic life and habitat criteria.

The Department, therefore, determines that flows provided by current and proposed Project operations provide sufficient water quality and sufficient water quantity to support the Class B designated use of habitat for fish and other aquatic life downstream of the Project.

3) Aquatic Habitat – Fish Passage (38 M.R.S. § 465(3)(A), (C); 38 M.R.S. § 465(4)(A), (C))

The Lockwood, Hydro Kennebec, Shawmut, and Weston Projects are run-of-river projects, with all the water of the Kennebec River flowing through or over the dams and discharging to the river. For each Project, the habitat below (or downstream of) the dams must be characterized as unimpaired. By influencing the flow of the water, the dams and their discharge impact the ability of fish to pass the section of river where the dams are located. By influencing fish passage, the dams and their discharge affect the resident biological community in the Kennebec River.

For the Applicant to satisfy applicable State water quality standards, the Applicant must demonstrate that the water flowing through and over the Shawmut Dam, which discharges into the Kennebec River, supports indigenous species, does not cause adverse

impacts to aquatic life, and does not adversely affect the characterization of the habitat below the dam as unimpaired. The Applicant must also demonstrate that implementation of the Kennebec Species Protection Plan at the Lockwood, Hydro Kennebec, and Weston Projects supports indigenous species, does not cause adverse impacts to aquatic life, and does not adversely affect the characterization of the habitat above and below the Weston Project, and below the Lockwood and Hydro Kennebec Dams, as unimpaired.

To demonstrate compliance with these applicable State water quality standards, the Applicant must show that Projects' discharge supports safe, timely, and effective upstream and downstream fish passage. Safe, timely, and effective fish passage is necessary to achieve Class B and Class C standards by ensuring the receiving waters are of sufficient quality to support all species of fish indigenous to the receiving waters and to maintain the structure and function of the resident biological community. 38 M.R.S. § 465(3)(C), (4)(C).

While the Kennebec Species Protection Plan is designed to address requirements for species under the Endangered Species Act, namely, Atlantic salmon, Atlantic sturgeon, and shortnose sturgeon in the Project areas, implementation of fish passage affects all diadromous species at each of these four Projects. Therefore, this section will examine whether the proposals in the Kennebec Species Protection Plan, which are incorporated in the Shawmut relicensing application and the license amendment applications for the other three projects, meet State water quality standards.

The Department received agency review comments on the application materials from DMR and DIFW. DMR emphasized that aquatic habitat upstream of the Lower Kennebec Dams contains almost 100% of Atlantic salmon spawning and rearing habitat in the Kennebec River Basin(?), over 50% of spawning and rearing habitat for American shad and blueback herring, and significant habitat for the other indigenous diadromous species. DMR's comments provide information that the passage effectiveness standards proposed for Atlantic salmon would not be achieved by the Applicant's proposals for improvements to upstream and downstream fish passage, and that the Applicant's proposals will not provide effective fish passage to all indigenous diadromous fish species and life stages without additional measures. These comments are incorporated herein.

DIFW commented on the risk of Aquatic Invasive Species (AIS) entering the watershed with the installation of volitional passage at the Lower Kennebec Dams. These comments are incorporated herein.

To ensure that the State's interest with respect to achieving safe, timely, and effective fish passage consistent with State water quality standards is represented and that the Department has the full benefit of the fisheries expertise of the State with respect to diadromous species in the Kennebec River Basin, the Department carefully considered the comments from DMR and DIFW when evaluating whether fish passage measures are sufficient to address adverse impacts to aquatic life. While NMFS and USFWS provided comments in their Biological Opinion and Section 18 Fishway Prescription, as well as various other comments on the FERC record for the Lower Kennebec Dams, federal agencies do not have the same management goals as the State. Federal agencies do not apply State water quality standards in their recommendations and comments. Evaluating whether a discharge will comply with applicable State water quality standards is a responsibility that lies solely with the Department and that is best informed by the expertise of the state resource agencies with deep knowledge of Maine's diadromous species.

The Department received 332 public comments on the application materials related to fish passage at the Lower Kennebec Dams. One citizen provided information on invasive carp in the Lower Kennebec River. Three hundred and twenty-nine citizens requested that the Department consider denying the WQC applications or requiring stronger measures for fish passage. The Department also received a combined comment from the Kennebec Coalition,[19] Conservation Law Foundation, the Penobscot Nation, and the Houlton Band of Maliseet Indians (the "Conservation Groups and Tribes") in opposition to certification for the Lower Kennebec Dams.

a. Existing Habitat and Resources

The Lower Kennebec River in the Project areas supports the following diadromous species: American shad, blueback herring, alewives, Atlantic salmon, American eel, and sea lamprey. The Lower Kennebec River below the Lockwood Dam also supports Atlantic sturgeon, shortnose sturgeon, and striped bass. Rainbow trout and brook trout are other migratory species observed in the Kennebec River.

i. Atlantic salmon

Historically, the Atlantic salmon fishery in the Kennebec River extended to Caratunk Falls, located approximately 42 river miles upstream of the Weston Project. Historical upstream barriers to Atlantic salmon were Grand Falls on the Dead River and the falls

[19] The Kennebec Coalition consists of the Atlantic Salmon Federation (including the Maine Council of the Atlantic Salmon Federation), Maine Rivers, the Natural Resources Council of Maine, Trout Unlimited, and the Kennebec Valley Chapter of Trout Unlimited.

immediately above the Kennebec River Gorge, now the site of Harris Station, also known as the Indian Pond Hydroelectric Project (FERC No. 2142). NMFS listed the Gulf of Maine Distinct Population Segment (GOM DPS) of Atlantic salmon in the Kennebec River as federally endangered in 2009. The Kennebec River has the most habitat units[20] in the Merrymeeting Bay Salmon Habitat Recovery Unit (SHRU) with 93,369 of those habitat units upstream of Lockwood Dam.[21] Nearly all the high-quality habitat in the Merrymeeting Bay SHRU is in the Kennebec River, specifically in the Sandy River, Carrabassett River, and upper Kennebec River. To reach this habitat, Atlantic salmon need to successfully ascend the Lower Kennebec Dams in a timely manner.[22]

Currently, Atlantic salmon captured at the Lockwood trap and truck facility are transported to the Sandy River by DMR. NMFS reports that approximately two-thirds of the necessary rearing habitat for Atlantic salmon occurs in the Sandy River, located upstream of the Shawmut Dam. The Sandy River is where nearly all stocking of Atlantic salmon occurs in the Kennebec River watershed and where all adult pre-spawn salmon trapped at the Lockwood Dam are transported.

Based on the NMFS and USFWS Recovery Plan (2019), the minimum goal for Atlantic salmon is to provide safe, timely, and effective upstream and downstream passage in order to achieve a minimum annual return of 500 naturally-reared adults to historic spawning/rearing habitat in the Kennebec River for Endangered Species Act downlisting and a minimum annual return of 2,000 naturally-reared adults to historic spawning/rearing habitat in the Kennebec River for delisting.[23] To reach spawning/rearing habitat in the Sandy River, Carrabassett River, and mainstem Kennebec River, all returning adults must annually pass upstream at the Lockwood, Hydro Kennebec, Shawmut, and Weston project dams.

ii. American shad

American shad historically were able to access 2,508 hectares of riverine spawning and rearing habitat above the head-of-tide in Augusta. Adults ascended the mainstem Kennebec River as far upstream as Norridgewock Falls, current location of the Abenaki (P-2364) and Anson (P-2365) hydroelectric projects, migrated into lower parts of the Sandy River, and ascended to the confluence of the East and West Branch of the Sebasticook River. Most of this habitat (59.6% or 1,495 hectares) lies above the Lockwood Dam. American shad are currently transported from the Lockwood trap and

[20] One habitat unit equals 100 square meters.
[21] NMFS BO at 60.
[22] *Id*.
[23] USFWS and NMFS Recovery Plan for the Gulf of Maine Distinct Population Segment of Atlantic salmon (Salmo salar), 2019, pg. 74; DMR Comments on Lower Kennebec Dams WQC Applications at 4.

truck facility for release into the Shawmut impoundment and in the Kennebec River downstream of the Shawmut Dam. Lockwood Dam impediments to migration at the dams have the potential to restrict access to habitat, decrease the efficacy of spawners, and reduce the probability of post-spawn survival.[24]

The minimum goal for American shad is to provide safe, timely, and effective upstream and downstream passage in order to achieve a minimum annual return of 1,018,0003 wild adults to the mouth of the Kennebec River; a minimum annual return of 509,000 adults above Augusta; a minimum of 303,500 adults annually passing upstream at the Lockwood and Hydro Kennebec Project dams; a minimum of 260,500 adults annually passing upstream at the Shawmut Project dam; and a minimum of 156,600 adults annually passing upstream at the Weston Project dam.[25]

iii. Blueback herring

The historic upstream migration limit for blueback herring in the Kennebec River was Norridgewock Falls. Most of this habitat (59.6% or 1,495 hectares) lies above the Lockwood Dam. There are 1,495 hectares of spawning/rearing habitat in the Kennebec River above the Lockwood Dam.[26] Blueback herring are currently transported from the Lockwood trap and truck facility for release into the Shawmut impoundment and in the Kennebec River downstream of the Shawmut Dam.

The minimum goal for blueback herring is to provide safe, timely, and effective upstream and downstream passage in order to achieve a minimum annual return of 6,000,0004 wild adults to the mouth of the Kennebec River; a minimum annual return of 3,000,000 adults above Augusta; a minimum of 1,788,000 adults annually passing upstream at the Lockwood and Hydro Kennebec Project dams; a minimum of 1,535,000 adults annually passing upstream at the Shawmut Project dam; and a minimum of 922,400 adults passing upstream at the Weston Project dam.[27]

iv. Alewife

The historic upstream migration limit for alewives in the Kennebec River was Norridgewock Falls. Above the Shawmut and Weston Projects in the Kennebec River there are 1,047 hectares of historic spawning and rearing habitat for alewives.

[24] DMR Comments on Lower Kennebec Dams WQC Applications at 4.
[25] *Id*.
[26] DMR Comments on the Lower Kennebec Dams WQC Applications at 8.
[27] *Id*. at 4-5.

Alewives are currently transported from the Lockwood trap and truck facility for release into the Shawmut impoundment and in the Kennebec River downstream of the Shawmut Dam.

The minimum goal for alewife is to provide safe, timely, and effective upstream and downstream passage to achieve a minimum annual return of 5,785,000 adults above Augusta; a minimum of 608,200 adults annually passing at the Lockwood, Hydro Kennebec, and Shawmut project dams; and a minimum of 473,500 adults annually passing upstream at the Weston Project dam.[28]

v. American eel

Juvenile and adult American eel are present in the Project areas. USFWS submitted a prescription for fishways for the Shawmut relicensing.[29] The prescription addresses upstream and downstream American eel passage. Specifically, the prescription requires the Applicant to: (1) provide interim downstream passage protection measures for American eel (i.e., nighttime turbine shutdowns); (2) construct any necessary upstream fish passage facilities for American eel as determined by USFWS following juvenile eel location studies; (3) construct any necessary downstream fish passage facilities for American eel as determined by USFWS following downstream passage studies; (4) develop a fishway operations and maintenance plan; and (5) test the effectiveness of any new upstream and downstream American eel passage facilities required by items 2 and 3 above. USFWS noted that the Applicant's proposals for the Lower Kennebec Dams provide an adequate framework for addressing upstream eel passage but made recommendations to improve downstream eel passage.[30]

The minimum goal for American eel is to provide safe, timely, and effective upstream and downstream passage throughout the historically accessible habitat up to Norridgewock Falls.[31]

vi. Sea lamprey

Sea lamprey are known to be present in the Kennebec River, although their abundance and distribution is not well known. Sea lamprey are co-evolved with other anadromous fish, including Atlantic salmon, and benefit the endangered fish by improving spawning habitat for salmon redds by their own nest-building habits, which flush compacted silt and sediment from the riverbed. In addition, sea lamprey deliver marine nutrients to

[28] *Id*. at 5.
[29] FERC e-library Accession # 20211112-5250.
[30] *See* USFWS Comments on the DEIS. FERC e-library Accession # 20240603-5215.
[31] DMR Comments on the Lower Kennebec Dams WQC Applications at 5.

inland waters because they die shortly after spawning, providing forage for a variety of birds, fish, and macroinvertebrates. DMR reports that most of the habitat for sea lamprey in the Kennebec River Basin is located upstream of the Lockwood Project.[32] Annual fish passage reports indicate that an average of 19 sea lamprey per year were collected at the Lockwood Dam from 2014 to 2023.[33] Lockwood does not currently operate at night, when sea lamprey are known to migrate.

The minimum goal for sea lamprey is to provide safe, timely, and effective upstream and downstream passage throughout the historically accessible habitat.[34]

b. Studies

The Applicant conducted a baseline fish assemblage study in 2019 to characterize the occurrence, distribution, and relative abundance of fish species within the Shawmut Project area. The 2019 survey involved two primary sampling locations: the Shawmut impoundment and the Shawmut tailwater downstream to a point approximately 4,000 feet below the dam.

The Shawmut impoundment fish assemblage was surveyed September 16-18, 2019. Effort consisted of a total of 15 300-meter boat electrofish transects placed using a stratified-random design such that the upper, mid, and lower third of the impounded area received equal sampling effort. A total of 798 fish representing thirteen species were collected from the fifteen sampling locations in the Shawmut impoundment. The fish assemblage was dominated largely by yellow perch (51.4%), largemouth bass (12.3%), golden shiner (10.4%), and alewife (5%).

Fish community data was collected from three 300-meter electrofish transects placed within the 4,000-foot section of the Kennebec River located immediately downstream of Shawmut Dam during a single-day sampling event on October 11, 2019. A total of 51 fish representing seven species were collected from three sampling locations within the downstream reach. The most abundant species in the fish assemblage were fallfish (54.9%), smallmouth bass (13.7%), American eel (9.8%) and white sucker (9.8%).

In May and June 2016, the Applicant conducted a study of adult river herring behavior immediately below the Shawmut Dam to evaluate the fish's use of Project tailwater areas to aid in the design of the proposed upstream fish passage facility. During the study, 150 radio-tagged alewives were released approximately 3.4 miles downstream of Shawmut

[32] DMR Response to the Ready for Environmental Analysis (REA) at 8. FERC e-library Accession # 20200828-5199.
[33] FEIS at 69.
[34] DMR Comments on the Lower Kennebec Dams WQC Applications at 5.

and their movements were monitored between the release point and the Shawmut Dam. The study showed that 79% of the tagged fish moved upstream and were detected in one or more of the monitored tailrace zones, most frequently in the area downstream of the hinged flashboard spillway section of the dam, and spent the most time in the area of the forebay Trainor gate located between the two powerhouses. Tagged fish were found less frequently in the Units 1-6 tailwater area. The results of this study assisted development of the upstream fish lift design.

The existing Lockwood fish lift's passage effectiveness for Atlantic salmon was tested in 2016, 2017, 2018 and 2019. Results found that the fish lift is 67% effective at passing Atlantic salmon upstream.[35]

The Applicant also conducted a radio-telemetry study of downstream smolt passage to determine the preferred passage routes and to estimate whole station survival.[36] The study included the release of tagged smolts at Shawmut during 2013, 2014, and 2015. Study results showed that the downstream bypass was used 38.7% of the time, followed by passage over the spillway (21.4%), through the 1982 powerhouse (21.1%), and through the 1912 powerhouse (11.6%). The hinged-board spill route—only used during the final release of 2014 and in the 2015 study year after the Applicant determined that downstream smolt passage did not achieve proposed survival rates—passed smolts through three sections of opened hinged flashboards adjacent to the power canal and was shown to be used just 5.2% of the time. Survival for smolts using the downstream bypass passage route was 97.4% and those passing over the spillway achieved 100% survival. Smolts passing through the hinged boards spill saw 86.7% survival, and those passing through the turbines achieved 92.1% survival through the 1912 powerhouse and 93.1% survival though the 1982 powerhouse. Whole station survival for the Project was determined to be 93.5%.[37,38] NMFS estimates the cumulative mortality of smolts along their downstream migration route through the Lower Kennebec dams is 46.8%.[39] NMFS notes that dam passage, particularly through the turbines, can cause disorientation, loss of equilibrium, scale loss, and physical injury that can ultimately contribute to secondary impacts, including higher disease rates or increased predation. The effects on

[35] FEIS at 53-54.
[36] Whole station survival is the combination of survival statistics for each passage route, determined through study of various downstream passage routes.
[37] Whole station survival values reported by Brookfield are based on all passage routes, including turbine passage, and represent the three-year average at each project location based on the subset of smolts released immediately upstream of each dam and adjusted for background mortality using passage success of the concurrent subset of smolts released immediately downstream of each dam.
[38] Baseline whole station survival estimates for radio-tagged smolts were 96.3% in 2013, 93.6% in 2014, and 90.6% in 2015.
[39] NMFS BO at 139.

downstream migration of shad, blueback herring, alewife, sea lamprey, and adult Atlantic salmon at the Shawmut Dam have not been studied.

In 2007, the Applicant conducted a radio-telemetry study of out-migrating adult American eels. The study showed that 93% of radio-tagged silver eels released upstream of the Shawmut Project passed via turbine Units 7 and 8 (located in the 1982 powerhouse), and that use of the downstream bypass by eels was low, at between 0 to 8%. Immediate survival of silver eels was estimated to be 69%. The Applicant conducted a second radio-telemetry study in 2008 to evaluate the effectiveness of the deep gate located between the two powerhouses at various flows while altering nighttime operations of turbine Units 1-6 and shutting down nighttime use of turbine Units 7 and 8. The study determined that opening the deep gate 2.5 feet at a flow of approximately 425 cfs and shutting off Units 7-8 increased use of the downstream bypass system to 83% and resulted in an increase in immediate survival to 92%. As a result of its studies on out-migrating silver eels, the Applicant annually opens the deep gate and turns off Units 7 and 8 during the night for a six-week period between September 15 and November 15 as a means to pass adult eels downstream at the Shawmut Project.

The Applicant also performed a fish passage feasibility study at the Shawmut Project, which was submitted to FERC on July 1, 2019.[40] The purpose of the study was to explore a range of fish passage improvements at the Lower Kennebec Dams as well as energy enhancements to offset any loss of generation due to fish passage improvements. The study evaluated fish passage improvements only at the Lockwood, Shawmut, and Weston Projects. Options including dam removal, nature-like fishways with and without generation, and maintaining the status quo with current proposals were considered.

c. Passage Effectiveness Standards

For upstream passage, the Applicant proposes to operate fishways at the Hydro Kennebec, Shawmut, and Weston Projects. The Applicant proposes to construct a new volitional fishway at the Lockwood Project to be operated alongside the existing fish lift. The new Lockwood volitional fishway would be located at the head of the bypassed reach within the footprint of the existing east spillway section and would consist of (1) an approximately 530-foot-long, 60-foot-wide concrete vertical slot fishway on the east side of the river at the head of the bypassed reach; and (2) an approximately 260-foot-long, 10-foot-wide attraction flow channel. To facilitate fishway construction, the Applicant would remove a portion of the east spillway section and replace it with two 71-foot-wide

[40] FERC e-library Accession # 20190701-5154.

crest gates. It would also construct a 92-foot-long flood wall between the fishway and the shoreline, and construct a permanent access road to the new fishway.

In 2017, Brookfield completed construction of a fish lift at the Hydro-Kennebec Project, but it has yet to be put into permanent operation pending construction of upstream fishways at the Shawmut and Weston projects and an additional upstream fishway in the Lockwood bypassed reach.

At the Shawmut Project, Brookfield proposes to construct new upstream anadromous fishways consisting of a fish lift and integrated spillway adjacent to the 1912 Powerhouse, and a concrete bypass channel through the island separating the two powerhouse tailraces. The fish lift would consist of a 31-foot-long, 15-foot-wide, and 56.5-foot-tall steel tower and hopper structure constructed on an 81-foot-long, 21-foot-wide, and 24-foot-tall concrete and steel entrance flume. The spillway would be about 93 feet long and 16 feet wide at its widest point and would be located adjacent to the fish lift on the non-overflow portion of the dam. The spillway would discharge to a plunge pool adjacent to the fish lift entrance flume. The concrete bypass channel would be about 77 feet long and 10.5 feet wide and would enable fish migrating upstream in the 1982 Powerhouse tailrace to move across the island and into the 1912 Powerhouse tailrace where they could access the new fish lift entrance to be passed over the dam.

The proposed Weston fishway would consist of a fish lift system with an integrated AWS spillway to provide for permanent swim-through fish passage. The fish lift and AWS spillway would be located between the powerhouse and the log sluice on South Channel Dam. The fish lift and AWS spillway would be approximately 30 feet wide and 70 feet high. An approximately 15-foot-long section of South Channel Dam would be removed down to elevation 144 feet to allow for installation of the AWS spillway.

For downstream passage, the Applicant proposes a combination of resurfacing spillways, nighttime shutdowns, changes to spillway operations, and guidance booms. Brookfield proposes 2-inch screens (trash racks) at Lockwood, Hydro Kennebec, Weston, and Units 1-6 at Shawmut, and 1-inch screens at Units 7-8 at Shawmut. The proposed performance standards resulting from those measures are discussed below.

Fishway performance standards are used to assess the performance of a fishway at facilitating timely passage for a given fish species. Herein, the Department will evaluate the Applicant's proposed passage effectiveness standards and comments received regarding passage effectiveness from the resource agencies.

i. Atlantic salmon

For upstream passage of Atlantic salmon, Brookfield proposes a 96% passage effectiveness rate within 48 hours of approaching 200 meters downstream of each dam. This would result in an upstream cumulative passage rate of 84.9% over all four Lower Kennebec Dams, with 192 hours of passage delay within 200 meters below the dams. Brookfield proposes a downstream passage effectiveness rate of 97% for salmon smolts within 24 hours of approaching within 200 meters upstream of each dam, resulting in a cumulative passage effectiveness rate of 88.5% at all four Lower Kennebec Dams, with 96 hours of passage delay within 200 meters above the dams.

Both DMR and NMFS find that the Applicant's proposed upstream passage effectiveness standard (96% within 48 hours) for Atlantic salmon would be sufficient to provide safe, timely, and effective passage. Much of the data relied on by FERC and the Applicant to demonstrate that its proposed measures would effectuate that passage effectiveness standard comes from a comparison to the Milford Project (FERC No. 2534) on the Penobscot River. Studies at the Milford Project showed that its fish lift was 95.5% effective in the first year and 100% effective in the second year at passing salmon that approached within 200 meters of the project.[41]

However, the passage effectiveness standards at Milford failed to meet the Applicant's proposal for delay rates. The average delay in Atlantic salmon passage at the Milford Project was 12 days from 2014 to 2019.[42] A more recent study showed that the delay is an average of 16 to 23 days and resulted in fish losing 11-22% of their initial fat reserves.[43] FERC could not identify any fish lifts that currently meet a 48-hour delay standard.[44] FERC states, "although Brookfield's existing and new fishways should achieve its proposed passage effectiveness standard of 96% at each project, whether it can do so within 48 hours of a fish approaching each project is less certain."[45] Delay in upstream passage reduces survival and spawning success.[46]

The Applicant states that their proposal for downstream passage would result in a cumulative passage effectiveness standard of 88.5%. This passage effectiveness standard estimate, however, does not take indirect mortality into consideration, which includes

[41] FEIS at 54.
[42] FEIS at 66.
[43] Rubenstein, S. R., Peterson, E., Christman, P., & Zydlewski, J. D. (2022). Adult Atlantic salmon (Salmo salar) delayed below dams rapidly deplete energy stores. *Canadian Journal of Fisheries and Aquatic Sciences*, *80*(1), 170-182.
[44] FEIS at 67.
[45] FEIS at 471.
[46] Rubenstein, et al. (2022), *supra* n. 49.

mortality from injury or delay as a result of dam operations.[47] Currently, the mortality rate is 29.9% for smolts passing through the four dams.[48] It is unclear whether the Applicant's proposed improvements to downstream passage will achieve the proposed mortality rate of 11.5%.

DMR recommends that the Lower Kennebec Dams achieve an upstream passage rate of at least 96% within 48 hours for adult Atlantic salmon and a downstream passage rate of at least 97% within 24 hours for Atlantic salmon smolts and kelts.[49] DMR commented that it has serious concerns about the ability of the currently proposed measures to achieve delay standards, but that with more robust measures and continued improvements, the Applicant's proposed standards are possible to achieve.[50]

The Department finds that the Applicant's proposals would not achieve 96% upstream passage effectiveness within 48 hours of approach or 97% downstream passage effectiveness within 24 hours of approach, and therefore would not provide safe, timely, and effective passage for Atlantic salmon. The Department determines that additional measures are necessary to achieve these standards so that the Projects support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community. The Department also finds that effectiveness testing and adaptive management measures are necessary to ensure that passage effectiveness standards are achieved.

ii. American shad

Brookfield proposes a 70% upstream passage effectiveness standard at the Shawmut Project, resulting in a cumulative effectiveness rate of 2%.[51] Brookfield proposes a downstream effectiveness rate of 95% for all alosines at each Project.[52]

While Brookfield's proposed passage effectiveness standards would increase the number of American shad available to pass upstream of the Weston Project by 1,452 fish per year, the Department finds that the Applicant's proposal is not sufficient to meet minimum management goals in the Kennebec River. Information from the FEIS shows that none of the proposed fishways would achieve the 70% upstream passage effectiveness proposed by the Applicant.[53] At Lockwood, the proposed vertical slot

[47] NMFS BO at 126-32, 159.
[48] NMFS BO at 139.
[49] Atlantic salmon spawn upstream of the Lower Kennebec Dams; therefore, on the downstream route, they are in a different phase of their life cycle as smolts.
[50] DMR Comments on WQC Applications at 6.
[51] FEIS at Table 5-9.
[52] FERC FEIS at Table 3-43.
[53] FEIS at 68

fishway would result in an upstream passage effectiveness of 19.2% at the Project overall.[54] Based on a study at the Milford fish lift, FERC estimated that the current proposals would result in an upstream shad passage effectiveness of 30.9% for each of the three other Lower Kennebec Dams, resulting in a cumulative upstream passage effectiveness rate for shad passing through the four dams in sequence of 0.5%.[55] That is, for every 200 adult shad that approach the Lockwood Dam, only 1 would make it past Weston.

Although FERC estimates that downstream passage effectiveness rates could exceed 95% with the Applicant's proposals, that does not consider indirect mortality from injury or delay.[56] Migration delays impact their reproductive success through expenditure of energy and mismatch of environmental conditions.[57]

DMR modeling shows that American shad upstream passage effectiveness must be 85% within 72 hours of approach, and downstream effectiveness must be 95% within 24 hours of approach to meet minimum management goals in the Kennebec River.[58] DMR utilized a life-history model (*anadrofish*[59]) to develop performance standards for American shad at the four hydroelectric projects on the Lower Kennebec River. This tool uses the best available scientific information to model population responses to a range of upstream and downstream passage performance at dams within a river system. These modeling efforts determined that upstream passage needed to meet or exceed 85% (combined with at least 95% downstream passage) to meet DMR's management goal for American shad in the river.

It is feasible to achieve high passage performance for American shad. For example, the average effectiveness of upstream passage at the Safe Harbor Project on the Susquehanna River was 76% from 1997 to 2019 with a single fishway, with many years exceeding 85% passage efficiency.[60] Large numbers of American shad also pass the Columbia River dams each year, suggesting that those fishways may provide efficient American shad passage. DMR expects an 85% upstream passage standard is achievable, particularly with a robust adaptive management plan in place, potential for two fishways at each project, and appropriate water management (i.e., at minimum, 5% of station capacity used as attraction for each fishway and directing spill near fishway entrances to be used as additional attraction).

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[54] FEIS at 55.
[55] FEIS at 55.
[56] FEIS at 82, 84, 92, 94, 103, 108-10.
[57] DMR Comments on WQC Applications at 7.
[58] DMR Comments on WQC Applications at 6.
[59] Available at this link: https://github.com/danStich/anadrofish.
[60] DMR Comments on WQC Applications at 7.

The Department finds that the Applicant's proposal to achieve 70% upstream passage effectiveness for American shad would not provide safe, timely, and effective passage, and that the Applicant's proposals may not achieve the estimated 95% downstream passage effectiveness. The Department determines that additional measures are necessary to achieve DMR's recommended passage effectiveness standards so that the Projects support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community. The Department also finds that effectiveness testing and adaptive management measures are necessary to ensure that passage standards are achieved after fish passage measures are implemented.

iii. Blueback herring

Brookfield proposes a 70% upstream passage effectiveness standard at the Shawmut Project, resulting in a cumulative effectiveness rate of 14.7%.[61] Brookfield proposes a downstream passage effectiveness standard of 95% for all alosines at each Project.[62]

FERC estimates that under Brookfield's proposals 49.4% of river herring[63] would successfully pass upstream at Lockwood, while 65.1% would successfully pass the other three Lower Kennebec Dams, resulting in a cumulative upstream passage effectiveness rate of 13.6% for river herring.[64] FERC estimates that downstream effectiveness could exceed 95% at the Lockwood Project and 90% at all four Lower Kennebec Dams, however, those estimates do not take delays or indirect mortality into account.[65]

Blueback herring require timely access to lakes or slow-moving river habitat to spawn, which may necessitate migration of hundreds of kilometers in the Kennebec River. Migration delays impact their reproductive success through expenditure of energy and mismatch of environmental conditions, as also seen with American shad.[66] Similarly, their iteroparous life history requires safe downstream routes at dams for adults after spawning to allow for repeated spawning migrations in following years.

Brookfield has only proposed a passage effectiveness standard for blueback herring for the Shawmut Project. DMR modeling shows that upstream passage must be 90% within 72 hours at each Project, and downstream passage must be 95% within 24 hours at each

[61] FEIS at Table 5-10.
[62] FEIS at Table 3-43.
[63] River herring include blueback herring and alewife.
[64] FEIS at 56.
[65] FEIS at 82, 83, 92, 94, 103, 108-109.
[66] DMR Comments on WQC Applications at 7.

Project to achieve minimum management goals in the Kennebec River.[67] DMR utilized a model by Dr. Dan Stitch, which is a stochastic, life-history based, simulation model for blueback herring for the Mohawk and Kennebec Rivers.[68]

A 2021 radio telemetry study[69] at the Milford fish lift documented 86.1% passage effectiveness for river herring. Given the lessons learned at Milford since commencement of operations, and increased understanding in the field of fish passage engineering since, DMR expects a 90% upstream passage standard could be achievable, particularly with a robust adaptive management plan in place, potential for two fishways at each project, and appropriate water management (i.e., at minimum, 5% of station capacity used as attraction for each fishway and directing spill near fishway entrances to be used as additional attraction).

The Department finds that the Applicant's proposals to achieve 70% upstream passage effectiveness for Blueback herring at the Shawmut Project only would not provide safe, timely, and effective passage, and that the Applicant's proposals may not achieve the estimated 95% downstream passage effectiveness. The Department determines that additional measures are necessary to achieve minimum management goals in the Kennebec watershed and DMR's recommended passage effectiveness standards so that the Projects support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community. The Department also finds that effectiveness testing and adaptive management measures are necessary to ensure that passage standards are achieved after fish passage measures are implemented.

iv. Alewife

Brookfield proposes a 70% upstream passage effectiveness standard at the Shawmut Project, resulting in a cumulative effectiveness of 14.7%.[70] Brookfield proposes a downstream passage effectiveness of 95% for all alosines at each Project.[71]

FERC estimates that under Brookfield's proposals, 49.4% of river herring[72] would successfully pass upstream at Lockwood, while 65.1% would successfully pass the other three Lower Kennebec Dams, resulting in a cumulative upstream passage effectiveness rate of 13.6% for river herring.[73] FERC estimates that downstream effectiveness could

[67] DMR Comments on WQC Applications at 9.
[68] DMR Comments on WQC Applications at 9.
[69] Accession number # 20220118-5295.
[70] FEIS at 68.
[71] FEIS at Table 3-43.
[72] River herring include blueback herring and alewife.
[73] FEIS at 56.

exceed 95% at the Lockwood Project and 90% at all four Lower Kennebec Dams, however, those estimates do not take delays or indirect mortality into account.[74]

Alewives require timely access to lakes or slow-moving river habitat to spawn, which may necessitate migration of hundreds of kilometers in the Kennebec River. Migration delays impact their reproductive success through expenditure of energy and mismatch of environmental conditions, as seen with American shad.[75] Similarly, their iteroparous life history requires safe downstream routes at dams for adults after spawning to allow for repeated spawning migrations in following years.

DMR modified an existing alewife population model[76] to develop performance standards for alewife at the Lower Kennebec Dams. The model uses the best available scientific information to compare theoretical spawner abundance between scenarios with dam passage effectiveness standard. DMR's modifications added stochasticity[77] in the model through the recruits per acre parameter, given the uncertainty of true carrying capacity estimates for alewife in the Kennebec River. DMR's modeling efforts determined that the upstream passage effectiveness needs to meet or exceed 96% with a downstream passage effectiveness rate of 95% to meet minimum management goals for alewife in the Kennebec River.

The Department finds that the Applicant's proposals to achieve 70% upstream passage effectiveness for alewife would not provide safe, timely, and effective passage, and that the Applicant's proposals may not achieve the estimated 95% downstream passage effectiveness. The Department determines that additional measures are necessary to achieve DMR's recommended passage effectiveness standards so that the Projects support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community. The Department also finds that effectiveness testing and adaptive management measures are necessary to ensure that passage standards are achieved after fish passage measures are implemented.

v. American eel

Brookfield proposes to modify eelways, implement night-time turbine shutdowns, and test the effectiveness of upstream and downstream American eel passage at each Project in accordance with the USFWS fishway prescription.[78] No specific passage standards are proposed by the Applicant. However, FERC estimates that implementation of

[74] FEIS at 82, 83, 92, 94, 103, 108-109.
[75] DMR Comments on WQC Applications at 7.
[76] DMR Comments on WQC Applications at 8.
[77] Stochastity refers to randomness or unpredictability; it contributes to a robust model.
[78] USFWS Letter Affirming Modified Prescription for Fishways.

Brookfield's proposals could result in a downstream passage effectiveness of 88.2% at Lockwood, 97.5% at Hydro Kennebec, 97% at Shawmut, and 89.4% at Weston, resulting in a cumulative survival rate of 74.6% across all four Projects.[79]

USFWS noted that, "while [USFWS] does not currently have a performance standard for eel specific to the Kennebec River [and] performance standards are not strictly necessary to determine whether a project is achieving safe, timely, and effective upstream and downstream passage. . .performance standards have been established in several other river basins and hydropower projects in the region and could serve as models."[80] USFWS provided numerous examples of river-basin or project-specific performance standards for eels throughout New England and the mid-Atlantic regions of the U.S. These include: (1) 95% project survival for eels in the Connecticut River; (2) 85% downstream survival at each mainstem dam on the Susquehanna River; (3) 95% downstream survival for each project on the Merrimack River; and (4) 95% downstream survival for dams on the Naugatuck River in Connecticut.[81] USFWS also notes that numerous FERC-licensed projects require downstream passage standards ranging from 85% to 95% survival for eels (*See* FERC Nos. 2355, 1888, 3472, 2955). FERC used the information provided by USFWS in their analysis of alternatives in the FEIS.

The Anson and Abenaki Projects upstream on the Kennebec River require a 90% passage standard for American eel at permanent passage facilities.[82] Other Maine hydroelectric projects have a 90% upstream passage standard with exit within 24 hours (*See* FERC Nos. 2555, 2556, 2364, 2365, 2611, 2574, 2322, 2325, 5073, 2942, 2984, 2931, 2941, and 2932).

DMR recommends an upstream passage performance standard of 90% and a downstream passage standard of at least 95% within 24 hours for American eel. Until a river specific passage standard is established for the Kennebec River, the Department finds, based on information from USFWS on performance standards in the region, that the Lower Kennebec Dams must each meet a 90% upstream and 95% downstream passage standard for American eel to ensure safe, timely, and effective passage. As demonstrated by USFWS, this standard is consistent with many river systems in the region, including in Maine. In addition, this standard takes into account that there are additional projects on the Upper Kennebec River (Anson and Abenaki) that American eel must pass on their downstream migration to complete their lifecycle.

[79] FEIS at Table 5-7.
[80] USFWS Comments on DEIS at 4.
[81] USFWS Comments on DEIS at 4.
[82] Article 406 of FERC Licenses; FERC e-library Accession #'s 20030729-3001, 20030807-0326.

New or existing and untested upstream eelways need to be tested to ensure that they are constructed, operating, and functioning as intended. There are multiple large-scale changes in discharge proposed at each Project. USFWS minimum attraction water guidance for eel ramps is a mere 50 gallons per minute (~0.11 cfs), thus even miniscule changes in discharge can render previously constructed eelways ineffective.[83] Studies are needed to confirm that an eelway is passing representative size classes of eels compared to those present below a dam. In addition, an independent tag-recapture or passive integrated transponder (PIT) study is necessary to determine the proportion of tagged eels that can successfully find (i.e., approach) and pass the eelway to ensure that it is providing safe, timely, and effective passage.

The Department finds that the Applicant's proposals for American eel would not provide safe, timely, and effective passage. The Department determines that additional measures are necessary to achieve DMR's recommended passage effectiveness standards so that the Projects support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community. The Department also finds that effectiveness testing and adaptive management measures are necessary to ensure that passage standards are achieved after fish passage measures are implemented.

vi. Sea lamprey

Brookfield proposes that all upstream anadromous fishways operate 24 hours per day from May 1 to June 30 for sea lamprey passage.[84]

DMR reports that sea lamprey are capable of reaching small, high-gradient, headwater streams. They spawn in gravel-cobble substrate, and the spawning process results in streambed modification and sediment transport. A life history-based modeling framework does not exist to assist in development of performance standards for sea lamprey. However, information from tagging studies of modern fishways can serve as a proxy for how new fishways on the Kennebec River may perform for sea lamprey. A University of Maine study conducted at the Milford fishway, a modern fish lift on the Penobscot River, is the best approximation of conditions for passage at the Lower Kennebec Dams.[85] During the first year of the study, 41 of 50 (82%) of tagged sea lamprey that approached the project were successfully passed. Given that each of the Lower Kennebec Dams is anticipated to have fish passage that will operate 24 hours per day during the sea lamprey passage season, DMR expects that each facility will be able to achieve 80% upstream passage effectiveness. FERC calculated that it is possible to

[83] USFWS *Fish Passage Engineering Design Criteria,* Northeast Region R5, Hadley, Massachusetts (2019).
[84] FEIS at 70.
[85] Peterson E, R Thors, D Frechette, and JD Zydlewski. 2023. Adult sea lamprey approach and passage at the Milford dam fishway, Penobscot River, Maine, United States. North American Journal of Fisheries Management 43(4): 1052-1065.

achieve up to 98.7% passage at Lockwood, and 82.2% cumulative passage of sea lamprey at the Lower Kennebec Dams, indicating the reasonableness of this standard.[86] The Department also finds that effectiveness testing and adaptive management measures are necessary to ensure that passage standards are achieved after fish passage measures are implemented.

d. Discussion and Findings

The information provided by the Applicant, along with the data analyses and study results discussed above, demonstrates that the Lower Kennebec Dams' existing upstream and downstream fish passage facilities do not provide safe, timely, and effective fish passage; therefore, the discharges to the Kennebec River from the Lockwood, Hydro Kennebec, Shawmut, and Weston Projects cause adverse impacts to aquatic life and detrimental changes in the resident biological community.

The Department finds that the Applicant's proposed measures and standards for fish passage at the Lower Kennebec Dams will not provide effective fish passage to all indigenous diadromous fish species and life stages without additional measures. As currently proposed, the Projects will continue to have significant adverse impacts on indigenous fish species and their habitat. These adverse impacts include, but are not limited to, anticipated low passage efficiency rates at upstream and downstream fishways; mortality and injury to upstream and downstream migrating diadromous fish; significant delays in passage; and cumulative effects of impediments to passage in the Kennebec River. When taken cumulatively, the lack of effective upstream and downstream passage measures could prevent meaningful restoration of any diadromous fish species in and above the Project areas and could prevent the achievement of DMR's management goals for the Kennebec River.

DMR comments that the Applicant's proposals for passage standards are not sufficient to meet minimum management goals in the Kennebec River, and that the Applicant's proposals for fish passage improvements will not meet those required passage standards. DMR recommends measures to achieve those passage standards.

Passage structures are typically (except for American eel) designed to pass multiple types of diadromous species. The Department recognizes that it is challenging to make one structure work for species of different sizes at different life stages. However, the Department has general concerns regarding the design of the upstream passage measures proposed by the Applicant. NMFS stated that fishways rarely achieve passage

[86] FEIS at Tables 3-12 and 3-13.

effectiveness greater than 90% for any species.[87] New upstream passage facilities will be impacted by the current nighttime shutdown measures and associated spill to protect out-migrating smolts. During spill flows, water passes along the spillway and is not concentrated near fishway entrances, which results in false attraction and significant delay of upstream migrants. The timing of these spill flows overlaps with peak river herring upstream migration and has resulted in decreased passage efficiency for river herring.[88] The proposed extension of these nighttime shutdowns to up to 54 days would exacerbate impacts on upstream migrants.

The Department also has general concerns regarding downstream passage. There is not sufficient evidence that the current measures proposed by the Applicant for downstream passage would meet passage effectiveness standards. Discussed in more detail below, the Department has concerns regarding the proposed trash racks at the Lower Kennebec Dams.

It is crucial that passage effectiveness standards are achieved to ensure the Lower Kennebec Dams attain safe, timely, and effective passage that supports all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community. Considering the 40-year license term for the Shawmut Project and the importance of the aquatic habitat in the Kennebec River and above the four Lower Kennebec Dams, the Department concludes that the Project would not provide safe, timely, and effective fish passage if passage standards are not sufficient to meet minimum goals for diadromous species on the Kennebec River. Therefore, the passage standards in Condition 3(A) are required for the indigenous diadromous species at the Lower Kennebec Dams. The Department also concludes that effectiveness testing and adaptive management measures are necessary to ensure those passage standards are met. Effectiveness testing and adaptive management measures specific to each Project are discussed below.

<u>Measures Necessary at all Lower Kennebec Dams to Achieve Required Passage Effectiveness Standards:</u>

i. Design, construct, operate, and maintain a 0.75-inch or less, full-depth, angled or inclined rack structure in the forebay within four years of license amendment approval or relicensing at each project in accordance with USFWS guidelines (2019 or current version).

[87] NMFS BO at 211.
[88] DMR Comments on WQC Applications at Figure 1.

FERC found that the introduction of new 0.75-inch or 1-inch angled screens combined with a surface bypass operating at 5% of station unit flow would reduce entrainment into turbines at the Lower Kennebec Dams.[89] At the Shawmut Project, this change would reduce entrainment of smolts into Units 1-6 from 11.9% to 6.6% and entrainment into Units 7-8 from 21.5% to 6.6%.[90] At the Weston Project, new full-depth angled trash racks with a maximum of 1-inch spacing would reduce entrainment from 31.6% to 6.6%.[91] At the Hydro Kennebec Project, this change would reduce smolt entrainment from 28.1% to 6.6%.[92] At the Lockwood Project, this change would reduce smolt entrainment from 14.9% to 6.6%.[93] However, FERC states that "only the 0.75-inch trash racks would physically exclude any Atlantic salmon smolts or juvenile shad."[94]

Brookfield has proposed or is required to construct or maintain fish guidance boom systems and overlays that are intended to preclude downstream migrating fish from entrainment. However, many anadromous species may pass downstream at depth.

Data provided by Brookfield demonstrates that the guidance booms used at the Lockwood, Hydro-Kennebec, and Weston Projects do not guide 14.3-30.6% of the migrating smolts away from the turbines.[95] Data provided by Brookfield also shows that 32.7% of the downstream migrating smolts were entrained into the turbines at the Shawmut Project and that the instantaneous survival rate was 7% lower when fish went through the turbines compared to spill routes at Shawmut,[96] which does not even take indirect mortality into account.[97]

In their comments on the proposed downstream alternatives for the West Enfield Project (P-2600), USFWS summarized the effectiveness of guidance booms on the Kennebec River, at the Lockwood and Weston projects, and concluded "the boom does not provide safe, timely, and effective passage for [USFWS's] trust species and does not comport with our most up to date design criteria."[98] USFWS noted that inefficiencies associated with guidance booms may be caused by downward velocities that are produced by the

[89] FEIS at 586.
[90] FEIS at 90.
[91] FEIS at 81.
[92] FEIS at 101.
[93] FEIS at 107. These projected entrainment reduction rates are based on 5 years of monitoring at the Stillwater A and Orono A Projects, which showed that a downstream passage facility consisting of 1-inch spaced trash racks with a surface bypass operating at 5% of Station Unit Flow resulted in an average powerhouse entrainment rate of 6.6% for smolts.
[94] FEIS at 586.
[95] SPP Table 5-1.
[96] FLA at Table 4-22.
[97] *See* DMR Comments on WQC Applications at 12.
[98] USFWS Comments on West Enfield Downstream Alternatives, FERC e-library Accession # 20211217-5213.

booms themselves.

In their comments, DMR states that the anticipated guidance structures at the Projects are unlikely to prevent or significantly reduce entrainment of adult river herring, juvenile alosines, and juvenile sea lamprey. Adult river herring are more likely to migrate downstream past the Lower Kennebec Dams during the summer months (July-September) when average flows are not likely to result in spill at the Projects. During this time, most of the river flow in a typical year would go through the turbines. Adult river herring would typically migrate downstream in proportion to the ratio of flow provided at each passage route. With an ineffective boom system and large-spaced trash rack overlays that do not provide further guidance, these fish will fit right through the trash racks and pass through the turbines, resulting in significant injury and mortality. This issue is even more pronounced for smaller juvenile alosines, which have decreased swimming abilities and are even more likely to follow proportional flow paths at the Projects. Thus, under the current proposal, there is minimal to no protection for these fish to prevent them from being entrained in the project turbines. Even fish that cannot pass through the trash rack overlays (i.e., adult American shad) may experience severe impingement due to relatively high intake velocities and no additional guidance to downstream passage routes once they have passed downstream of the guidance booms.

The current proposal would also be ineffective for American eel. American eel typically approach hydroelectric projects in the lower portion of the water column and therefore would not be effectively guided by floating booms, like the Applicant proposes. USFWS recognized in its Fish Passage Design Criteria that floating guidance systems are designed for fish that commonly approach the guidance system near the upper levels of the water column, making such systems less appropriate for eel.. USFWS recommended 0.75-inch clear spaced racks to exclude eels that are roughly 26.7 inches or greater from turbines.[99] The FEIS notes that 0.75-inch racks would exclude nearly all sizes of adult alewife, blueback herring, and most American eel.[100]

Broadly, the current proposal will result in adverse impacts to indigenous diadromous species and will not be conducive to producing self-sustaining runs above these Projects if further measures are not required. USFWS has summarized passage data on guidance booms in a filing.[101] The data in their summary demonstrates that guidance booms do not meet current USFWS design criteria, nor do they provide safe, timely, and effective passage for many species.

[99] USFWS Comments on DEIS at 6.
[100] FEIS at Table O-2.
[101] Accession # 20211217-5213.

FERC's analysis estimated that 0.75-inch, full-depth screening would eliminate turbine entrainment for Atlantic salmon kelts, adult river herring, and American eels, and significantly reduce entrainment for Atlantic salmon smolts and juvenile alosines, compared to the proposed action. FERC found that survival with new full-depth, 0.75-inch angled trash racks, a new surface bypass operating at a flow equal to 5% of Station Unit Flow, and no guidance boom at the Lockwood Project would be 96.8% for smolt, 97.7% for juvenile alosines, and 98% for adult river herring.[102] At the Shawmut Project, survival with the racks and no guidance boom would be 96.2% for smolt, 94.6% for juvenile alosines, and 98% for adult river herring.[103] At the Hydro Kennebec Project, survival with the racks and no guidance boom would be 96.7% for smolt, 97.6% for juvenile alosines, and 98% for adult river herring.[104] At the Weston Project, survival with the racks and no guidance boom would be 97.5% for smolt, 98% for juvenile alosines, and 98% for adult river herring.[105] The only way the effectiveness standard for alewife and blueback herring can be achieved is with the construction of new 0.75-inch, full-depth angled trash racks.[106]

Additionally, FERC demonstrates in Table O-3 in the FEIS that current operations at the Lower Kennebec Dams have high velocities that exceed USFWS design criteria. There are six powerhouses total at the Lower Kennebec Dams. Currently, the bar spacing of the trash racks on each powerhouse intake ranges from 1.5 inches to 4 inches.[107] To protect kelts and adult American shad from turbine entrainment, Brookfield proposes that 5 of the 6 powerhouses would be fitted with trash racks or overlays with 2-inch bar spacing. At the 1912 powerhouse at the Shawmut Project, Brookfield proposes to install a narrower bar spacing of 1-inch to protect salmon smolts and help meet downstream passage effectiveness standards.[108] Brookfield's proposal includes replacing existing racks with closer-spaced overlay racks but maintaining the existing rack dimensional area. By maintaining the dimensional area but decreasing the open area of the rack by reducing the rack spacing, Brookfield's proposal will increase velocities from existing conditions.[109] Table O-4 in the FEIS demonstrates that the introduction of 0.75-inch, full- depth angled trash racks would reduce velocities due to the larger dimensional area of the structure. Therefore, 0.75-inch, full-depth angled racks would reduce impingement and entrainment risk from high approach velocities.

The Department determines that this condition is necessary to ensure the Lower

[102] FEIS at Tables 3-70, 3-73, 3-75.
[103] FEIS at Tables 3-39, 3-44, 3-49.
[104] FEIS at Tables 3-56, 3-63, 3-64.
[105] FEIS at Tables 3-23, 3-27, 3-30.
[106] FEIS at 207.
[107] *See* FEIS Appendix O, at 586.
[108] FEIS at 438.
[109] FEIS at 470, 586.

Kennebec Dams support indigenous species and do not cause adverse impacts to aquatic life.

ii. Develop and implement a plan to conduct yearly counts on each species of fish that enter and pass each project.

Counts are necessary for resource agencies to determine whether each Project is meeting minimum goals for the watershed and to document the introduction of Aquatic Invasive Species (AIS). Currently, AIS are prevented from dispersing further upstream in the Kennebec River by sorting facilities at the Lockwood Project. As volitional passage is established at the Lower Kennebec Dams, AIS ranges have the potential to expand. The Applicant must develop and implement a plan to report on counts at each Project to address these concerns, a plan to be approved by the Department in consultation with DIFW and DMR. The Department determines that this condition is necessary to ensure the Lower Kennebec Dams support indigenous species and do not cause adverse impacts to aquatic life.

Measures Necessary to Achieve Required Passage Effectiveness Standards at the Lockwood Project:

i. Construct, operate, and maintain crest gates in the bypass reach adjacent to the volitional fishway capable of conveying spill flows during nighttime shutdowns required under NMFS's Biological Opinion or a minimum of 20% of station capacity, whichever is greater, within 3 years of license amendment approval.

Due to the complicated nature of the Lockwood Project, the new upstream passage facilities will be impacted by the current nighttime shutdown measures (typically beginning the last week of April and lasting 38-35 days) to protect out-migrating smolts. The nighttime shutdown measures overlap with the peak of the river herring upstream migration and have resulted in decreased passage efficiency of river herring. The potential extension of these nighttime shutdowns to up to 54 days would further impact river herring and American shad upstream passage. These impacts are documented through counts at the Lockwood Project for river herring and American shad, which have both decreased when compared to previous years at Lockwood and to other projects in Maine.[110]

Successful fishways must create hydraulic signals strong enough to attract fish to one or

multiple entrances in the presence of competing flows. The Lockwood Dam is long and has multiple discharge locations that will provide significant false attraction flows during the passage season, specifically, during May, June, and July when the majority of anadromous species are migrating upstream. Water in excess of the station capacity is spilled across the entire spillway. As a result, there will be false attraction at the Project during the majority of the upstream migration season to multiple areas without a fishway to the headpond.

To ensure safe, timely, and effective passage of both river herring and smolts, the Applicant must utilize new crest gates and attraction water channel for the volitional fishway to manage spill flows in a way that will promote attraction to the fishway during the nighttime shutdowns and high flows.[111] By raising flashboards prior to the upstream migration season and utilizing the crest gates to direct flow to pass adjacent to the new volitional fishway in the bypass, Brookfield can improve far- and near-field attraction during the nighttime shutdowns and high flows during the upstream migration season.

The Department determines that this condition is necessary to ensure the Lower Kennebec Dams support indigenous species and do not cause adverse impacts to aquatic life.

ii. Construct a flume to connect the existing fish lift to the headpond within 4 years of license amendment approval.

Currently and into the future, not all fish can be moved at the current fish lift as it is not connected to the headpond and cannot be operated at night when trap and truck operations cannot be carried out safely.

Additionally, the fish lift cannot currently operate 24 hours a day given trucking constraints for sea lamprey and other nocturnal migrants. The FEIS requires Brookfield to operate all upstream anadromous fishways 24 hours per day from May 1 to June 30 for sea lamprey passage. This necessitates the inclusion of the flume connection to the headpond, because relying on trap and truck operations would not result in the safe, timely, and effective passage of sea lamprey. The flume will also assist with a fish capacity issue at the fish lift. The holding capacity of the fishway is limited to three tanks and fish passage is reliant on staff to transport fish upstream. When the tanks are full and staff are not able to transport fish from Lockwood, fish are sluiced back downstream of the project.[112] This limited capacity increases delay and mortality because fish are forced

[111] Accession # 20230320-5179.
[112] Fish are also sluiced back downstream on weekends and holidays if staff are not available.

to attempt to pass the Lockwood project even if they were already successful in finding the fish lift. This can be particularly impactful at high water temperatures. Fishway effectiveness is also reduced if fish cannot pass.

The Department therefore determines that this condition is necessary to ensure the Lower Kennebec Dams support indigenous species and do not cause adverse impacts to aquatic life.

iii. Effectiveness testing and adaptive management measures to ensure that performance standards are achieved for all species.

Performance effectiveness testing and adaptive management measures are necessary to ensure the achievement of performance standards for every indigenous diadromous fish species. Performance standards for fish passage and adherence to them are the best method for the Department to determine that a Project meets safe, timely, and effective fish passage. The Department received recommendations for passage effectiveness testing and adaptive management measures from DMR in their comments on the WQC applications.

For upstream passage, DMR recommended two fishways at each Project, but additional measures may be required to meet performance standards. The Applicant proposes to operate two fishways at the Lockwood Project.

In the conditions below, the Department lists alternatives for the Applicant to consider and implement to improve passage effectiveness standards, if necessary. The specific measures identified seek to provide a suite of solutions that have been effective on similar projects in the Northeast. Beyond new fishways, adaptive management measures can target improvements to the fishway entrance, internal fishway components, or nearfield attraction. Nearfield attraction involves improving the ability of fish to find fishway entrances, which can be accomplished by adding flow to an attraction water system (and/or taking away flow from competing sources) or moving fishway entrances away from turbulent and confusing flows. USFWS *Fish Passage Engineering Design Criteria* recommends that fishways have a minimum of 5% of station capacity dedicated to attraction flow. In general, the higher the percentage of total river flow used for attraction into the fishway, the more effective the facilities will be in providing upstream passage. Many of the lower Kennebec dams have long spillways with multiple spill routes that provide false attraction and contribute to delay. One possible adaptive measure to address this is by constructing an attraction flow channel capable of passing spill flows up to 20% of station capacity in the vicinity of the upstream fishway. This

would improve attraction to the fishway when the project would otherwise be spilling in locations distant to the fishway. Modifications to the spillway including construction of new spillway gates and/or rubber dams could also address attraction concerns.

The Department determines that effectiveness testing and adaptive management measures are the best way to ensure safe, timely, and effective fish passage at the Lockwood Project. The Department therefore finds that these conditions are necessary to ensure the Lower Kennebec Dams support indigenous species and do not cause adverse impacts to aquatic life.

Measures Necessary to Achieve Required Passage Effectiveness Standards at the Hydro Kennebec Project:

i. Effectiveness testing and adaptive management measures to ensure that performance standards are achieved for all species.

Performance effectiveness testing and adaptive management measures are necessary to ensure the achievement of performance standards for every indigenous diadromous fish species to meet minimum goals for diadromous species in the Kennebec watershed. Performance standards for fish passage and adherence to them are the best method for the Department to determine that a Project meets safe, timely, and effective fish passage. The Department received recommendations for passage effectiveness testing and adaptive management measures from DMR in their comments on the WQC applications.

In the conditions below, the Department lists alternatives for the Applicant to consider and implement to improve passage effectiveness standards, if necessary. The specific measures identified seek to provide a suite of solutions that have been effective on similar projects in the Northeast. This approach, and the measures identified, anticipate that performance standards may not be achieved immediately with the proposed construction, and that additional operational and structural modifications (such as increasing attraction flow, installing additional entrances, or constructing new fishways) may be necessary. The Applicant's proposed adaptive management of its upstream fishways include the development and implementation, in consultation with NMFS, of "additional operational or infrastructure measures, as reasonable and practicable, that are likely to meet or exceed the upstream performance standard." The Applicant's proposal does not specify possible adaptive management measures it will implement to achieve proposed upstream passage standards. The Applicant proposes the development of an adaptive management and monitoring plan that includes: (1) procedures for fishway effectiveness testing, (2) a description of a hatchery salmon stocking program to use in effectiveness testing, and (3)

a framework and schedule for identifying and selecting adaptive management measures if Brookfield fails to achieve salmon passage effectiveness standards at any of the Projects.

There is significant evidence that new measures, such as second fishways, will significantly improve performance for fish passage effectiveness and timing. FERC's analysis in the Final EIS stated that cumulative American Shad passage at the four Projects would increase from 0.5% to 6.2% with the addition of secondary fishways in the "Second Fish Lift Alternative" compared to the proposed action.[113] For river herring, the cumulative upstream passage rate through the four projects under the current proposal would equate to about 13.6% but would be 55.7% under the Second Fish Lift Alternative.[114] For sea lamprey, the cumulative upstream passage through the four Projects under the current proposal would equate to about 41.7% but would be 82.2% under the Second Fish Lift Alternative. [115] For Atlantic salmon, the cumulative upstream passage through the four projects under the current proposal would equate to about 93.5% but would be 99.6% under the Second Fish Lift Alternative.[116]

Passage efficiency for Pacific salmonids at eight dams on the Columbia River were regularly among the highest recorded for any migratory species, averaging 96.6%, which the study attributed to a "sustained adaptive management approach to fishway design, maintenance, and improvement" where many of the dams have more than one fishway.[117] Notable large river projects with two fishways proposed or previously constructed in Maine include Lockwood Dam (Kennebec), Milford Dam (Penobscot), and Woodland Dam (St. Croix), demonstrating that it is a reasonable measure to improve performance.

Regarding fish passage timing criteria, fishways on the Columbia River have consistently passed Pacific salmon in less than 48 hours.[118] Many of these dams providing consistent salmon passage have more than one fishway, which likely provides more opportunities for fish to pass and therefore leads to reduced passage delay. If multiple fishways are the reason for higher efficiencies, then it's probable that Brookfield could meet delay standards if a second fishway is built if performance is not met. Discussed above,

[113] FEIS at Table 3-8, 3-9.
[114] FEIS at Table 3-10, 3-11.
[115] FEIS at Table 3-12, 3-13.
[116] FEIS at Table 5-8.
[117] Keefer, M. L., Jepson, M. A., Clabough, T. S., & Caudill, C. C. (2021). *Technical fishway passage structures provide high passage efficiency and effective passage for adult Pacific salmonids at eight large dams.* PLoS One, 16(9), e0256805.
[118] *Stock-Specific Migration Timing of Adult Spring–Summer Chinook Salmon in the Columbia River Basin*, Adult Salmon and Steelhead Migration Studies: 1996-2014, University of Idaho Library Digital Collections.

modeling on the Kennebec River indicates that significant energy reserve loss can be caused by delays.[119]

To reduce the negative impacts of a dam on downstream migrating fish, well-performing downstream passage systems that consider not only current requirements regarding design, dimensioning, and location, but also the site-specific conditions and fish species, must be tested and modified to provide optimal performance. DMR commented that their recommendations are the best scientific and technical solutions common to species in the Northeast that utilize USFWS passage criteria.

The Department determines that effectiveness testing and adaptive management measures are the best way to ensure safe, timely, and effective fish passage at the Hydro Kennebec Project. The Department therefore finds that these conditions are necessary to ensure the Lower Kennebec Dams support indigenous species and do not cause adverse impacts to aquatic life.

Measures Necessary to Achieve Required Passage Effectiveness Standards at the Shawmut Project:

i. Effectiveness testing and adaptive management measures to ensure that performance standards are achieved for all species.

Performance effectiveness testing and adaptive management measures are necessary to ensure the achievement of performance standards for every indigenous diadromous fish species to meet minimum goals for diadromous species in the Kennebec watershed. Performance standards for fish passage and adherence to them are the best method for the Department to determine that a Project meets safe, timely, and effective fish passage. The Department received recommendations for passage effectiveness testing and adaptive management measures from DMR in their comments on the WQC applications.

The Applicant has proposed constructing a single upstream fish lift. Successful fishways must create hydraulic signals strong enough to attract fish to one or multiple entrances in the presence of competing flows (i.e., false attraction). The Shawmut Dam is extremely long and has multiple discharge locations that will provide significant false attraction flows during the passage season. DMR has serious concerns about the design, operation, and location of the fishway and believes the current proposal could result in significant delays and likely poor upstream passage efficiency for multiple species.

[119] Rubenstein, et al., 2022, *supra* n. 49.

DMR commented on concerns about the effectiveness of the proposed fishway in May, June, and July, when the majority of anadromous species are migrating upstream.[120] The maximum station hydraulic capacity of the Shawmut Project is 6,690 cfs, which is exceeded approximately 65% of the time in May, 35% of the time in June, and 20% of the time in July. Water in excess of station capacity is spilled at the sluice gate in the middle of the 1,435-foot long dam, the hinged flashboards on the west side of the dam, or the rubber crest(s) on the eastern half of the dam, providing multiple sources of false attraction. As a result, there will be false attraction at the project during most of the upstream migration season to multiple areas without a fishway to the headpond. A proposed cross channel egress from an identified false attraction zone would not provide passage to the headpond or directly to the lift.

In the conditions below, the Department lists alternatives for the Applicant to consider and implement to improve passage effectiveness standards, if necessary. The specific measures identified seek to provide a suite of solutions that have been effective on similar projects in the Northeast. The Department determines that passage effectiveness and adaptive measures are the best way to ensure safe, timely, and effective fish passage at the Lockwood Project. The Department therefore finds that these conditions are necessary to ensure the Lower Kennebec Dams support indigenous species and do not cause adverse impacts to aquatic life.

<u>Measures Necessary to Achieve Required Passage Effectiveness Standards at the Weston Project:</u>

i. Effectiveness testing and adaptive management measures to ensure that performance standards are achieved for all species.

Performance effectiveness testing and adaptive management measures are necessary to ensure the achievement of performance standards for every indigenous diadromous fish species to meet minimum goals for diadromous species in the Kennebec watershed. Performance standards for fish passage and adherence to them are the best method for the Department to determine that a Project meets safe, timely, and effective fish passage. The Department received recommendations for passage effectiveness testing and adaptive management measures from DMR in their comments on the WQC applications.

In the conditions below, the Department lists alternatives for the Applicant to consider and implement to improve passage effectiveness standards, if necessary. The specific measures identified seek to provide a suite of solutions that have been effective on similar

[120] DMR Comments on WQC Applications Table 3.

projects in the Northeast. This approach and the measures identified, anticipate that performance standards may not be achieved immediately with the proposed construction, and additional operational and structural modifications (such as increasing attraction flow, installing additional entrances, or constructing new fishways) may be necessary. The Applicant's proposed adaptive management of its upstream fishways include the development and implementation, in consultation with NMFS, of "additional operational or infrastructure measures, as reasonable and practicable, that are likely to meet or exceed the upstream performance standard." The Applicant's proposal does not specify possible modifications necessary to achieve its proposed upstream passage standards, including additional fishways. While the FEIS did not require testing of all the species, it does require the development of an adaptive management and monitoring plan that includes: (1) procedures for fishway effectiveness testing, (2) a description of a hatchery salmon stocking program to use in effectiveness testing, and (3) a framework and schedule for identifying and selecting adaptive management measures if the Applicant fails to achieve salmon passage effectiveness standards at any of the Projects.

There is significant evidence that new measures, such as second fishways, will significantly improve performance for fish passage effectiveness and timing. FERC's analysis in the FEIS stated that cumulative American Shad passage at the four Projects would increase from 0.5% to 6.2% with the addition of secondary fishways in the "Second Fish Lift Alternative" compared to the proposed action.[121] For river herring, the cumulative upstream passage rate through the four projects under the current proposal would equate to about 13.6% but would be 55.7% under the Second Fish Lift Alternative.[122] For sea lamprey, the cumulative upstream passage through the four Projects under the current proposal would equate to about 41.7% but would be 82.2% under the Second Fish Lift Alternative. [123] For Atlantic salmon, the cumulative upstream passage through the four Projects under the current proposal would equate to about 93.5% but would be 99.6% under the Second Fish Lift Alternative.[124]

Passage efficiency for Pacific salmonids at eight dams on the Columbia River were regularly among the highest recorded for any migratory species, averaging 96.6%, which the study attributed to a "sustained adaptive management approach to fishway design, maintenance, and improvement" where many of the dams have more than one fishway.[125] Notable large river projects with two fishways proposed or previously constructed in Maine include Lockwood Dam (Kennebec), Milford Dam (Penobscot),

[121] FEIS at Table 3-8, 3-9.
[122] FEIS at Table 3-10, 3-11.
[123] FEIS at Table 3-12, 3-13.
[124] FEIS at Table 5-8.
[125] Keefer, et al., *supra* n. 12.

and Woodland Dam (St. Croix), demonstrating that it is a reasonable measure to improve performance.

Regarding fish passage timing criteria, fishways on the Columbia River have consistently passed Pacific salmon in less than 48 hours.[126] Many of these dams providing consistent salmon passage have more than one fishway, which likely provides more opportunities for fish to pass and therefore leads to reduced passage delay. If multiple fishways are the reason for higher efficiencies, then it's probable that, if performance standards for delay are not met with current proposals, Brookfield could meet delay standards by constructing a second fishway. Discussed above, modeling on the Kennebec River indicates that significant energy reserve loss can be caused by delays.[127]

Successful fishways must create hydraulic signals strong enough to attract fish to one or multiple entrances in the presence of competing flows. The Weston Project presents added complexity due to a second channel within the Project footprint. DMR commented that the current fishway proposal of a single fishway and timeline of four years could be inadequate due to false attraction of fish to the secondary channel.

DMR commented that constructing an additional fishway would enhance upstream fish passage and could be necessary to meet Brookfield and agency goals for all species based on reasonable expectations and experience from other projects. As described in DMR's previous comments and in NMFS's BO, these large river projects have multiple competing flows and associated areas of potential false attraction.

To reduce the negative impacts of a dam on downstream migrating fish, well-performing downstream passage systems that consider not only current requirements regarding design, dimensioning and location, but also the site-specific conditions and fish species, must be tested and modified to provide optimal performance. The proposed measures are the best scientific and technical solutions common to species in the Northeast and utilize USFWS (2019) passage criteria.

The Department determines that effectiveness testing and adaptive management measures are the best way to ensure safe, timely, and effective fish passage at the Lockwood Project. The Department therefore finds that these conditions are necessary to ensure the Lower Kennebec Dams support indigenous species and do not cause adverse impacts to aquatic life.

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[126] *Stock-Specific Migration Timing of Adult Spring–Summer Chinook Salmon in the Columbia River Basin*, supra n. 113.
[127] Rubenstein, et al., 2022, *supra* n. 49.

Provided the Applicant complies with the requirements above and the conditions below, the Department concludes that fish passage at the Lockwood, Hydro Kennebec, Shawmut, and Weston Projects will be safe, timely, and effective and sufficient to avoid detrimental changes in the resident biological community. The water flowing through and over the Lockwood, Hydro Kennebec, Shawmut, and Weston Projects, which discharge into the Kennebec River, will support indigenous species and will not cause adverse impacts to aquatic life.

B. Dissolved Oxygen – Shawmut Project (38 M.R.S. § 465 (3)(B))

For this standard, the Applicant must demonstrate that the DO criteria for the Class B waters below the Shawmut Dam will not be less than 7 parts per million or 75% of saturation, whichever is higher, except that for the period from October 1st to May 14th, in order to ensure spawning and egg incubation of indigenous fish species, the 7-day mean dissolved oxygen concentration may not be less than 9.5 parts per million and the one-day minimum dissolved oxygen concentration may not be less than 8.0 parts per million in identified fish spawning areas.[128]

1. Existing Conditions

The Department finds that the Shawmut Project operates as a run-of-river facility and its impoundment receives waters discharged to the Kennebec River from the upstream Weston Project as well as surface water runoff, ice melt, and water from tributary streams.

2. Studies

The Applicant measured DO concentrations downstream of the Shawmut Dam between June 2, 2016, and August 31, 2016. DO concentrations in the Kennebec River downstream of the Project ranged from 7.7 mg/L to 9.6 mg/L in June, from 7.5 mg/L to 8.9 mg/L in July, and from 6.8 mg/L to 8.5 mg/L in August 2016. DO concentrations fell below the Class B criterion on three dates in August 2016, measuring 6.8 mg/L in the nighttime hours of August 9-11, and rebounding during the daylight hours to levels greater than 7.0 mg/L. DO percent saturation was above 75% throughout the monitoring period. DEA analyzed the slight DO excursions downstream of the dam and determined

[128] No fish spawning areas are identified by the Maine Stream Habitat Viewer in the Shawmut Project waters. Further, DIFW reported that it is unaware of any salmonid spawning habitat within the Project area. DIFW Comments on Shawmut WQC, July 26, 2021.

them to be the result of discharges from a non-Project facility located upstream of the Shawmut Dam or plant respiration. DEA reported that the impoundment data showed only one date when DO dipped below 5 mg/L that was below the thermocline, and that there was sufficient water with a temperature less than or equal to 24ºC such that the impoundment attains Class B.[129]

3. Discussion and Findings

DO data collected by the Applicant indicates, and the Department finds, that water in the Shawmut riverine impoundment and in the portion of the Kennebec River downstream of the Project is sufficiently oxygenated. The Department finds that data collected in the impoundment showed a single DO excursion below the Class B criterion of 7 parts per million but exceeding 5 parts per million in unstratified waters subject to Class C criterion, and that all impoundment DO measurements met the percent saturation standard. The Department further finds that data collected downstream of the Project Dam showed DO excursions during the nights of August 9-11, 2016, and DEA analysis indicates the nighttime excursions are likely the result of plant respiration or related to a non-Project facility located upstream. The Applicant's sampling results demonstrate that the Kennebec River in the Shawmut riverine impoundment and in the section of the river below the Project meets applicable Class B and Class C dissolved oxygen standards during critical water quality conditions. Based on the evidence in the record, the Department concludes that the Project meets DO water quality standards under current and proposed operating conditions.

C. Fishing, Navigation, and Recreational Access and Use – Shawmut Project (38 M.R.S. § 465 (3)(A); 38 M.R.S. § 465 (4)(A))

For this standard, the Applicant must demonstrate that the project waters are suitable for designated uses of recreation in and on the water, fishing, and navigation. It is the Department's longstanding position that a hydropower impoundment may be found suitable for recreation in and on the water if it has a stable or decreasing trophic state and is free of culturally induced algal blooms that impair its use and enjoyment.

[129] DEA Email dated November 2, 2020. DEA's analysis is based on all classes of rivers and streams, including impoundments classified as such, requiring that water quality be suitable for the designated uses of fishing and habitat for fish and other aquatic life and must be of sufficient quality to support all species of fish indigenous to the receiving waters. After consultation with DIFW, the Department concluded that there must be at least a 1-meter-thick layer of habitat to provide a thermal refuge to support cold water fish during low flow warm summer periods. Therefore, where there is cold water (24ºC or less according to Department rule 06-096 C.M.R. ch. 582), there must be at least a 1-meter thick layer of water with a minimum DO for the class.

The Department considers an impoundment to have a stable or declining trophic state unless it exhibits (1) a perceivable and sustained increase in its trophic state as characterized by its trophic state index (TSI) or other appropriate indices, or (2) the onset of algal blooms.[130] The trophic state is the ability of the water to produce algae and other aquatic plants. The trophic state of a body of water is a function of its nutrient content and may be estimated using the TSI, which includes measurements of chlorophyll, phosphorous, or SDT.[131] An algal bloom is defined as a planktonic growth of algae that causes SDT to be less than 2 meters.[132]

1. Existing Facilities and Use

The Kennebec River in the vicinity of the Project provides for boating, fishing, hiking, mountain biking, all-terrain vehicle riding, wildlife watching, snowmobiling, and more. The Ford Halifax State Historical Site, Easton Mountain Ski Area, Two Rivers Campground, and the Skowhegan Riverwalk are in the vicinity of the Project.

Recreation within the Project boundary typically includes motorized and non-motorized boating and fishing. Project lands and waters are generally available for public recreational use. Two formal recreation sites are provided at the Project, including the Hinkley Boat Launch on the west side of the Project impoundment, which includes a single lane concrete boat launch and ADA-compliant concrete dock (along with ADA-compliant parking for one, parking for three vehicles with boat trailers, and parking for five vehicles without trailers); and the Shawmut Canoe Portage located on the west side of the impoundment, consisting of a take-out area (with parking for eight vehicles), a put-in area (with parking for five vehicles), and a quarter-mile-long gravel path. Angler access is provided at the take-out and put-in locations.

Two non-project recreational access sites include the Skowhegan Boat Launch, located approximately 11 miles upstream of the dam along Route 2, and the Skowhegan Wayside Picnic Area. The Skowhegan Boat Launch provides access for motorized and non-motorized boats and for shoreline fishing. It also has a single-lane concrete boat launch and a parking lot with one paved ADA parking space and a gravel parking area with space for two vehicles with trailers and 3-4 vehicles without trailers. The Skowhegan Wayside Picnic Area is located on Route 2 and provides informal shoreline fishing access, nine picnic tables (three with grills), and parking for 23 vehicles. Informal recreation sites include two informal, roadside gravel parking pull-off areas along Route 2 that provide angler access to the impoundment from several informal foot trails. The

[130] 06-096 C.M.R. ch. 581 § 6(C).
[131] 06-096 C.M.R. Chapter 581 § 6(A).
[132] 06-096 C.M.R. Chapter 581 § 6(B).

easternmost informal access site along Route 2, south of Skowhegan, can accommodate approximately three vehicles; the westernmost informal access is also on Route 2, south of Skowhegan, and can accommodate 9-10 vehicles. On the east side of the impoundment, a gravel pull-off is located on River Road, approximately .5 miles downstream of the dam, with access to the shoreline from several informal foot trails and room for four vehicles. Finally, anglers access the east abutment area of Shawmut Dam from several informal 4x4 vehicle tracks and trails across privately owned lands and via a gated road. This area provides access to a rock ledge area downstream of the dam and the shoreline just below the Project tailrace.

The Kennebec River in the vicinity of the Shawmut Project is managed by DIFW as both a cool and cold water fishery. Common resident species include smallmouth bass, largemouth bass, sunfish, and perch.

2. Water Quality Data

As discussed above in Section 4(A), sample results for chlorophyll-*a*, total phosphorous, and SDT indicate that the Shawmut impoundment is mesotrophic.

3. Fishing and Recreation Studies

The Applicant collected recreational use data between June 2016 and May 2017 at each of the Project recreation sites and the informal access areas, including the Hinckley boat launch, Shawmut canoe portage take-out and put-in, Skowhegan boat launch, Skowhegan Route 2 wayside picnic area, Route 2 informal fishing access areas, River Road angler access area, and east abutment informal access area. Use was highest in summer (60.9%), followed by fall (23.8%), spring (10.9%), and winter (4.4%). The most popular recreation site was the Skowhegan Route 2 wayside picnic area, followed by the Skowhegan boat launch, Route 2 west roadside access, Hinckley boat launch, and the canoe portage put-in site. Use of the sites was estimated based on parking area capacity and showed the highest utilization rate occurred at the Skowhegan boat launch, followed by the Hinckley boat launch, both used at approximately 50% of the parking capacity during summer weekends. All other recreation sites were found to have a utilization rate of 15 % or less on average during summer weekends.

The Applicant conducted a radio telemetry study in 2017 to provide information on the movements of stocked brown trout in the Project area. Radio-tagged, hatchery-reared brown trout were released during river flow conditions of approximately 7,500 cfs and a water temperature of approximately 13 ºC. River flow rose sharply on May 26, 2017,

peaking at just over 22,000 cfs at midnight on May 27, 2017. Of the 26 radio-tagged, hatchery-reared individuals that moved downstream of Shawmut, 81 percent of those fish (21 of the 26) did so during the flow pulse occurring immediately following release. This group included 18 of the 19 individuals that also passed downstream of the Hydro Kennebec and Lockwood Projects. The median duration of time following initial detection immediately upstream of Shawmut until detection at Station 6 downstream of Lockwood for that subset of individuals was 12 hours. Radio-tagged, hatchery-reared trout passing downstream of the three Projects spent a limited amount of time in the Shawmut tailrace following downstream passage at that location (median duration = 0.3 hours).

4. Applicant's Proposal

No changes to recreation in and on the water, fishing, or navigation are proposed.

5. Discussion and Findings

The Department finds that regional recreational opportunities include hiking, hunting, mountain biking, all-terrain vehicle riding, wildlife watching, snowmobiling, and skiing, and that the Shawmut impoundment additionally supports and provides for fishing and both motorized and non-motorized boating uses. The Department finds that the Project's formal recreation sites are in good condition and are lightly used, with other non-Project sites seeing heavier use. The Department finds that there is sufficient capacity and access opportunities to Project waters to meet current and future uses.

The Department finds that the Shawmut impoundment has a stable or decreasing trophic state and is free of culturally induced algal blooms that impair its use and enjoyment. Additionally, the Department finds that resident fish are present in the Project area and that DIFW provides, and Project operations support, a sport fishery for resident and stocked salmonids and smallmouth bass above and below the Shawmut Dam. Based on the studies made by the Applicant and other information in the record, the quality of the water in the Project area is sufficient to support a sport fishery. Based on the evidence in the record, the Department determines that the Project operations meet the Class B and C designated uses of recreation in and on the water, fishing, and navigation.

D. Hydroelectric Power Generation – Shawmut Project (38 M.R.S. § 465(3)(A); 38 M.R.S. § 465(4)(A))

For this standard, the Applicant must demonstrate that the Project waters are suitable for the designated use of hydroelectric power generation.

1. Existing Generation

The Department finds that the Project has a total authorized generating capacity of 8.65 MW and is capable of producing a gross average energy output of 51,058 MWh of electricity annually.

2. Energy Utilization

The Project generates renewable power for Maine and the regional power pool administered by ISO New England, the non-profit independent system operator for New England. Currently, output is sold on the open market through bidding into the New England Power Pool market administered by ISO New England. Project power is fed to Central Maine Power's (CMP) transmission system through three General Electric transformers rated 750 kilovolt-ampere (KVA) 3 phase, 60 hertz; three GE transformers rated 1,250 KVA 3 phase, 60 hertz; and one Westinghouse step-up transformer rated 5,000 KVA, 3 phase, 60 hertz. All transformers are located in CMP's substation, adjacent to but outside the Project boundary.

3. Discussion and Findings

The Applicant proposed to continue the current mode of operations at the Project during the term of a new license, providing a dependable source of energy to the public power grid. This renewable power generation helps to offset reliance on non-renewable fossil fuel sources. Based on the evidence on record, the Department determines that the Project operations meet the designated use of hydroelectric power generation.

E. Drinking Water Supply – Shawmut Project (38 M.R.S. § 465(3)(A); 38 M.R.S. § 465(4)(A))

Class B and Class C standards require that water must be of sufficient quality to be used as drinking water after treatment.

1. Discussion and Findings

The Shawmut Project impoundment and the Kennebec River are not used as a drinking water supply. However, water quality data collected for the Trophic State Study in the

Project riverine impoundments and DO data collected downstream of the Project dams indicate that water quality meets State standards, and there are no culturally induced algal blooms. Based on the evidence in the record, the Department finds that the Project meets the designated use of drinking water after disinfection.

F. Industrial Process or Cooling Water Supply – Shawmut Project (38 M.R.S. § 465(3)(A); 38 M.R.S. § 465(4)(A))

Class B and Class C standards require that water must be of sufficient quality to be used as industrial process or cooling water supply.

1. Discussion and Findings

The Applicant reports and the Department finds that the Kennebec River in the Project area is used by Sappi North America, Inc.'s (Sappi) Somerset Operations mill for process water at approximately the mid-point of the project impoundment.[133] Water quality data indicates the water is suitable as an industrial process water supply and a cooling water supply. Based on evidence in the record, the Department finds that the Project meets the designated use of industrial process or cooling water supply.

G. Antidegradation – Shawmut Project (38 M.R.S. § 464(4)(F))

For this standard, the Applicant must demonstrate that the Project waters maintain existing in-stream water uses occurring on or after November 28, 1975. The Department may approve a WQC pursuant to Section 401 of the CWA if the standards of classification of the water body and the State's antidegradation policy are met, or for a project affecting a water body in which the standards are not met, if the Project does not cause or contribute to the failure of the water body to meet the standards of classification.

1. Discussion and Findings

The Department finds that the present Shawmut Hydroelectric Project dam was originally developed for hydroelectric power generation in 1912 and included the dam and 1912 powerhouse. An additional powerhouse was added in 1982 and, in 2008-2009, the pin-supported flashboards were replaced with a 730-foot-long inflatable rubber bladder in three sections, each being 4.46-feet-high when fully inflated. While structures and operations have been modified over time, in-stream uses are generally the same on and

[133] Put something if Sappi comments again.

after November 1975 and include hydropower generation, recreation in and on the water, including fishing and navigation, and providing a supply of process and cooling water.

With respect to the designated use of the Kennebec River as habitat for fish and other aquatic life and the narrative standard as it pertains to fish passage, as explained in Section 4(A)(3) above, provided the Applicant complies with the requirements and conditions of this WQC, the Department finds that the Project operations will meet the requirement of the antidegradation policy.

H. Historic and Cultural Resources

Assessment of historic and cultural resources is not a statutory requirement for WQC. However, the Section 106 of the National Historic Preservation Act requires FERC to account for the impact of hydropower facilities on historic properties. FERC requires the Applicant to prepare a Historic Properties Management Plan as a license condition, and the Maine Historic Preservation Commission (MHPC) reviews the impact of hydropower projects on cultural resources under agreement with the Advisory Council on Historic Preservation. Therefore, inclusion of MHPC review in the WQC is appropriate.

1. Discussion and Findings

The Applicant filed a Historic Architectural Survey Report with FERC, which was reviewed by MHPC. MHPC concluded that the proposed measures to the Project will have no adverse effect upon historic properties. The Department finds that the proposed enhancement, mitigation, and protection measures will have no adverse effect upon historic properties.

V. PUBLIC COMMENTS

The Department initiated a public comment period on the application materials on May 12, 2025. The Department received a total of 427 public comments and 2 agency review comments. Agency review comments were received from DMR and DIFW and are discussed above in Section 4(A)(3). The Department received 332 public comments related to fish passage, discussed above in Section 4(A)(3). The Department received 94 public comments from Sappi employees, requesting that the Department approve the WQC for the Shawmut Project.

On October 9, 2025, the Department issued a draft Order approving water quality certification for the continued operation of the existing Shawmut Hydroelectric Project and the implementation of the Kennebec Species Protection Plan at the Lockwood, Hydro Kennebec, and Weston Hydroelectric Projects. Comments on the draft order were invited from the Applicant, the state resource agencies, and the public. The deadline for comments was 5:00 P.M. on October 16, 2025.

Comments on the draft Order were received from

VI. DEPARTMENT CONCLUSIONS

BASED on the above Findings of Fact and the evidence contained in the application and supporting documents, and subject to the conditions listed below, the Department CONCLUDES that the continued operation of the SHAWMUT HYDROELECTRIC PROJECT and implementation of the Kennebec Species Protection plan at the LOCKWOOD, HYDRO KENNEBEC, and WESTON HYDROELECTRIC PROJECTS, as described above, will result in all waters affected by the project being suitable for all designated uses and meeting all other applicable water quality standards, provided the Applicant complies with the conditions outlined in Section 7 below:

A. The Applicant provided sufficient evidence and the Department finds and determines that, as discussed in Section 4(A)(1) and (2), the Shawmut Project meets the classification standard for aquatic habitat in the Project impoundment and in the outlet waters below the Project dam. The Department concludes that the water discharged from the Shawmut impoundment meets the classification standards for Class B waters. 38 M.R.S. § 465(3)(A).

B. The Applicant provided sufficient evidence, and the Department finds and determines that, as discussed in Section 4(A)(3) above and provided the Applicant complies with Conditions 3(A)-(E) in Section 7 below, Project operations related to fish passage will meet the narrative classification standards related to the designated use of habitat for fish and other aquatic life at the Shawmut Project. The Department also finds, provided that the Applicant complies with Conditions 3(A)-(E) in Section 7 below, that the implementation of the Kennebec Species Protection Plan at the Lockwood, Hydro Kennebec, and Weston Projects will meet the narrative classification standards related to the designated use of habitat for fish and other aquatic life. 38 M.R.S. §§ 465(3)(A), (C).

C. The Applicant provided sufficient evidence and the Department finds and determines that the Shawmut impoundment and waters downstream of the Shawmut Project dam meet the remaining narrative classification standards for Class B and Class C

waters and are determined to be of such quality that these waters are suitable for the designated uses of drinking water after treatment; recreation in and on the water; fishing; agriculture; industrial process and cooling water supply; hydroelectric power generation; and navigation. 38 M.R.S. § 465(3)(A); 38 M.R.S. § 465(4)(A).

D. The Applicant provided sufficient evidence and the Department find and determines that DO concentrations in the Kennebec River below the Shawmut Dam meet applicable numeric Class B and Class C DO standards. 38 M.R.S. § 465(3)(B); 38 M.R.S. § 465(4)(B).

E. The Applicant provided sufficient evidence and the Department finds and determines that existing in-stream uses which have actually occurred on or after November 28, 1975, and the level of water quality necessary to protect those uses, are maintained. The Department concludes that the Shawmut Project complies with the State's antidegradation policy. 38 M.R.S. § 464(4)(F)(3).

VII. DECISION AND ORDER

THEREFORE, the Department APPROVES the water quality certifications of Brookfield White Pine Hydro, Merimil Limited Partnership, and Hydro Kennebec LLC and GRANTS certification pursuant to Section 401(a) of the Clean Water Act, concluding that there is a reasonable assurance that the continued operation of the SHAWMUT HYDROELECTRIC PROJECT and implementation of the Kennebec Species Protection plan at the LOCKWOOD, HYDRO KENNEBEC, and WESTON HYDROELECTRIC PROJECTS, as described above, will not violate applicable water quality standards, SUBJECT TO THE FOLLOWING CONDITIONS:

1) WATER LEVELS - SHAWMUT PROJECT

A. Except as temporarily modified by 1) approved maintenance activities, 2) extreme hydrologic conditions,[134]3) emergency electrical system conditions,[135] or 4) agreement between the Applicant, the Department, and appropriate state and/or

[134] For the purpose of the certification and Order, extreme hydrologic conditions mean the occurrence of events beyond the Licensee's control such as, but not limited to, abnormal precipitation, extreme runoff, flood conditions, ice conditions, drought, or other hydrologic conditions such that operational restrictions and requirements contained herein are impossible to achieve or are inconsistent with the safe operation of the Project.
[135] For the purpose of this certification and Order, emergency electrical system conditions mean operating emergencies beyond the Licensee's control which require changes in flow regimes to eliminate such emergencies which may in some circumstances include, but are not limited to, equipment failure or other temporary abnormal operating conditions, generating unit operations or third-party mandated interruptions under power supply emergencies, and orders from local, state, or federal law enforcement or public safety authorities.

federal agencies, impoundment water levels must be maintained within 1 foot of normal full pond elevation (112.0 feet mean sea level).

B. These conditions regarding water levels are necessary to ensure that the discharge from the Project will comply with water quality requirements, including those found at 38 M.R.S. § 465(3)(A) and § 465(4)(A) and as discussed above at Section 4(A) and (C). The water levels of the impoundment, which are determined by the discharge, affect, among other things, the water quality requirements of the designated uses of fishing; recreation in and on the water; navigation; and habitat for fish and other aquatic life.

2) MINIMUM FLOWS - SHAWMUT PROJECT

A. The Applicant must provide flow releases from the Shawmut Hydroelectric Project in accordance with the Applicant's proposal. Except as temporarily modified by 1) approved maintenance activities, 2) extreme hydrological conditions (see footnote 134), 3) emergency electrical system conditions (see footnote 135), or 4) agreement between the Applicant, the Department, and appropriate state and/or federal agencies, the Applicant must operate the facility as run-of-river, where outflow generally approximates inflow. All required flows shall be the sum of generating flows from the powerhouse and bascule gates/leakage/spillage flows from the dam.

B. These conditions regarding minimum flows are necessary to ensure that the discharge from the Project will comply with water quality requirements, including 38 M.R.S. § 465(3)(A) as discussed above at Section 4(A) and (C). The flow of the discharge from the Project affects, among other things, whether the receiving waters are of sufficient quality to support the designated uses of fishing; recreation in and on the water; navigation; and habitat for fish and other aquatic life.

3) UPSTREAM and DOWNSTREAM FISH PASSAGE

A. LOCKWOOD, HYDRO KENNEBEC, SHAWMUT, AND WESTON PROJECTS

i. The Applicant must achieve an upstream performance standard of at least 96% within 48 hours for adult Atlantic salmon and downstream performance standard of at least 97% within 24 hours for Atlantic salmon smolts and kelts.

ii. The Applicant must achieve an upstream passage performance standard of 85% within 72 hours for American shad and downstream performance standard of at least 95% within 24 hours for American shad.

iii. The Applicant must achieve an upstream passage performance standard of 96% within 72 hours for alewives and downstream performance standard of at least 95% within 24 hours for alewives.

iv. The Applicant must achieve an upstream passage performance standard of 90% within 72 hours for blueback herring and downstream performance standard of at least 95% within 24 hours for blueback herring.

v. The Applicant must achieve an upstream passage performance standard of 80% for sea lamprey.

vi. Adaptive Management to Achieve Performance Standards for American eel[136]

a) The Applicant must achieve a downstream performance standard of 95% for American eel and conduct two years of effectiveness testing to document that standard has been met (2 total testing events).

b) The Applicant must reevaluate the location of upstream eelway(s) to determine if eels continue to congregate near, and are able to enter, the existing eelway(s). This evaluation shall consist of one or more years of nighttime visual observations below Project spillways and other Project works throughout the upstream eel season. No later than 6 months after the initiation of siting studies, the Applicant shall distribute a draft of study results to the Department.

c) The Applicant must achieve an upstream passage performance standard of 90%. The Applicant must create a study plan for effectiveness testing to demonstrate the achievement of the upstream performance standard at each Project. The study plan must demonstrate that the upstream migrating eels that approach the Project can successfully find and ascend the upstream eelway(s). The study must occur in the year following installation or modification to upstream eelway(s), or other environmental changes at the Project. The study must be approved by the Department in consultation with DMR.

vii. The Applicant must design, construct, operate, and maintain a 0.75-inch or less, full-depth, angled or inclined rack structure in the forebay within 4 years of license or license amendment approval in accordance with USFWS Fish Passage Engineering Design Criteria (2019 or later). The structure shall include low-level entrances to a downstream bypass system and provide guidance to a surface bypass location(s).

viii. The Applicant must develop and implement a plan to conduct yearly counts on each species of fish that enter and pass. The plan shall detail the approach

[136] Adaptive management for eel applies to all four projects; adaptive management measures for other species are set forth in a project specific manner in the conditions below.

for counting fish at each Project, the resolution of data for counts, details on other data that will be provided (e.g., operations data), and shall be submitted to the Department prior to commencement of construction of passage measures. The plan must be approved by the Department in consultation with DMR and DIFW, and counts must be carried out in the first passage season in which new passage measures are operated at a given Project.

ix. The Applicant must develop a Fishway Operation and Maintenance Plan (FOMP) for the Lockwood, Hydro Kennebec, Shawmut, and Weston Projects. Brookfield shall submit a FOMP to the Department for approval in consultation with DMR and DIFW, consistent with review by federal agencies. Brookfield shall keep the FOMP updated to reflect any changes in fish passage operations and maintenance.

x. The Applicant shall develop, design, and submit plans for all new fish passage measures to the Department for review and approval in consultation with DMR and DIFW at 30%, 60%, 90%, and final design stages, consistent with review by federal agencies. The Department shall have 30 days to review and comment on any submitted design drawings.

B. LOCKWOOD PROJECT

i. The Applicant must construct, operate, and maintain a volitional fishway with auxiliary water supply spillway in the bypass within 3 years of license amendment approval.

ii. The Applicant must construct, operate, and maintain crest gates in the bypass reach adjacent to the volitional fishway capable of conveying spill flows during required nighttime shutdowns or a minimum of 20% of station capacity, whichever is greater, within 3 years of license amendment approval.

iii. The Applicant shall construct a flume to connect the existing fish lift to the headpond within 4 years of license amendment approval.

iv. The Applicant shall implement the following effectiveness testing to assess survival, injury, and delay in upstream and downstream passage and determine if the Project meets applicable performance standards in the first downstream fish passage season and the second upstream fish passage season following installation of the Conditions in 3(A) and 3(B)(1)-(3) above:

a) Prepare study plans for effectiveness testing for Atlantic salmon, American shad, alewife, blueback herring, American eel, and sea lamprey for review and approval by the Department a minimum of one year before the start of the passage season in which the study will be conducted. With Department approval, studies may be limited to specific species and life stages.

b) Distribute draft study results to the Department for review in consultation with DMR no later than 8 months after the initiation of effectiveness testing.

c) If performance standards have not been achieved, the Applicant must consult with the Department and DMR within 30 days of distribution of the effectiveness testing report to identify areas of deficiency and determine adaptive management measures to implement.

v. The Applicant shall implement the following adaptive management measures:

a) If upstream and/or downstream performance standards have not been achieved but the results are close (within 10% of performance standard criteria for passage efficiency or timing for the tested species), the Applicant can implement operations or structural modifications to address the deficiency with Department approval and in consultation with DMR and retest the facility as described in Condition 3(B)(4).

b) If upstream and/or downstream performance standards have not been achieved and the results are not close (not within 10% of performance standard criteria for passage efficiency or timing for the tested species), the Applicant shall implement one or more of the following measures no later than 3 years after the distribution of the effectiveness testing report, with Department approval:

1. Upstream passage: fishway entrance

i. Construction, modification, and/or addition of entrance(s) to either the fish lift or volitional fishway.

2. Upstream passage: internal fishway

i. Operational or structural modifications of fishway(s), such as lift frequency, baffle modifications, and entrance gate positions.

ii. Adjust flow within the fishway to address hydraulic concern and/or seasonal species-specific passage needs.

iii. Addition or modification of fallback prevention devices such as weirs, baffles, or trap gates.

iv. Reconstruction, replacement, or modification of the attraction water systems at either the fish lift or the volitional fishway, including building an alternative system.

v. Redesign and replace one of the upstream fishways determined to be deficient.

3. Upstream passage: nearfield attraction

i. Construction of additional crest or other spillway gates.

ii. Construction or modification of the tailwater area downstream of the crest gates and river right of the volitional fishway.

iii. Modification to fishway entrance locations.

4. Downstream passage

i. Construction of a new downstream fish bypass facility.

ii. Construction of additional crest gates or other spillway gates and/or other modifications to the spillway.

iii. Modifications to the downstream existing bypass facility.

iv. Installation of a uniform acceleration weir in the entrance to the downstream bypass.

v. Increase the downstream attraction flow of the downstream bypass up to 20% of hydraulic capacity.

5. The Applicant may propose alternative adaptive measures that are subject to review and approval by the Department.

6. The Applicant must repeat adaptive management measures contained in Condition (3)(B)(5) until passage effectiveness standards are achieved.

C. HYDRO KENNEBEC PROJECT

i. The Applicant shall implement the following effectiveness testing to assess survival, injury, and delay in upstream and downstream passage and determine if the Project meets applicable performance standards in the first downstream fish passage season and the second upstream fish passage season following installation of the Conditions in 3(A).

a) Prepare study plans for effectiveness testing for Atlantic salmon, American shad, alewife, blueback herring, American eel, and sea lamprey for review and approval by the Department a minimum of one year before

the start of the passage season in which the study will be conducted. With Department approval, studies may be limited to specific species and life stages.

b) Distribute draft study results to the Department for review in consultation with DMR no later than 8 months after the initiation of effectiveness testing.

c) If performance standards have not been achieved, the Applicant must consult with the Department and DMR within 30 days of distribution of the effectiveness testing report to identify areas of deficiency and determine adaptive management measures to implement.

ii. The Applicant shall implement the following adaptive management measures:

a) If upstream and/or downstream performance standards have not been achieved but the results are close (within 10% of performance standard criteria for passage efficiency or timing for the tested species), the Applicant can implement operations or structural modifications to address the deficiency with Department approval and in consultation with DMR and retest the facility as described in Condition 3(C)(1).

b) If upstream and/or downstream performance standards have not been achieved and the results are not close (not within 10% of performance standard criteria for passage efficiency or timing for the tested species), the Applicant shall implement the following measures no later than 3 years after the distribution of the effectiveness testing report:

1) Upstream passage

i. Design, construct, operate, and maintain a second fishway; and

ii. Construct, operate, and maintain attraction flow channel(s) for one of the fishways that discharge in the vicinity of the fishway entrance(s) and are capable of conveying the amount of required spillflows or a minimum of 20% of station capacity, whichever is greater.

2) Downstream passage

i. Construction of a new downstream fish bypass facility with low level entrances and surface entrance(s);

ii. Construction of additional crest gates or other spillway gates;

iii. Modifications to the existing downstream bypass facility.

c) The Applicant may propose alternative adaptive measures that are subject to review and approval by the Department.

d) The Applicant must repeat adaptive management measures contained in Condition 3(C)(2) until passage effectiveness standards are achieved.

D. SHAWMUT PROJECT

i. The Applicant must construct, operate, and maintain a fish lift with an integrated attraction water supply spillway adjacent to the 1912 Powerhouse and a fish passage flume to provide volitional passage to the Shawmut Project's headpond within 3 years of license issuance.

ii. The Applicant shall implement the following effectiveness testing to assess survival, injury, and delay in upstream and downstream passage and determine if the Project meets applicable performance standards in the first downstream fish passage season and the second upstream fish passage season following installation of the Conditions in 3(A) and 3(D)(1).

a) Prepare study plans for effectiveness testing for Atlantic salmon, American shad, alewife, blueback herring, American eel, and sea lamprey for review and approval by the Department a minimum of one year before the start of the passage season in which the study will be conducted. With Department approval, studies may be limited to specific species and life stages.

b) Distribute draft study results to the Department for review in consultation with DMR no later than 8 months after the initiation of effectiveness testing.

c) If performance standards have not been achieved, the Applicant must consult with the Department and DMR within 30 days of distribution of the effectiveness testing report to identify areas of deficiency and determine adaptive management measures to implement.

iii. The Applicant shall implement the following adaptive management measures:

a) If upstream and/or downstream performance standards have not been achieved but the results are close (within 10% of performance standard criteria for passage efficiency or timing for the tested species), the Applicant can implement operations or structural modifications to address the deficiency with Department approval and in consultation with DMR and retest as described in Condition 3(D)(2).

b) If upstream and/or downstream performance standards have not been achieved and the results are not close (not within 10% of performance standard criteria for passage efficiency or timing for the tested species), the Applicant shall implement one or more of the following measures no later than 3 years after the distribution of the effectiveness testing report:

3) Upstream passage

i. Design, construct, operate, and maintain a second fishway adjacent to the 1982 powerhouse.

ii. Construct, operate, and maintain attraction flow channel(s) for one of the fishways that discharge in the vicinity of the fishway entrance(s) and can convey the amount of required spillflows or a minimum of 20% of station capacity, whichever is greater.

iii. Modifications to the fish lift, including the entrance gate, internal infrastructure, and/or attraction water system.

4) Downstream passage

i. Construction of a new downstream fish bypass facility with low-level entrances and surface entrance(s).

ii. Construction of additional crest gates or other spillway gates.

iii. Modifications to the downstream existing bypass facility.

5) The Applicant may propose alternative adaptive measures that are subject to review and approval by the Department.

6) The Applicant must repeat adaptive management measures contained in Condition 3(D)(3) until passage effectiveness standards are achieved.

E. WESTON PROJECT

i. The Applicant must construct, operate, and maintain a new anadromous fish lift between the South Channel Dam log sluice and the powerhouse within 3 years after license amendment approval.

ii. The Applicant shall implement the following effectiveness testing to assess survival, injury, and delay in upstream and downstream passage and determine if the Project meets applicable performance standards in the first

downstream fish passage season and the second upstream fish passage season following installation of the Conditions in 3(A) and 3(E)(1).

a) Prepare study plans for effectiveness testing for Atlantic salmon, American shad, alewife, blueback herring, American eel, and sea lamprey for review and approval by the Department a minimum of one year before the start of the passage season in which the study will be conducted. With Department approval, studies may be limited to specific species and life stages.

b) Distribute draft study results to the Department for review in consultation with DMR no later than 8 months after the initiation of effectiveness testing.

c) If performance standards have not been achieved, the Applicant must consult with the Department and DMR within 30 days of distribution of the effectiveness testing report to identify areas of deficiency and determine adaptive management measures to implement.

iii. The Applicant shall implement the following adaptive management measures:

a) If upstream and/or downstream performance standards have not been achieved but the results are close (within 10% of performance standard criteria for passage efficiency or timing for the tested species), the Applicant can implement operations or structural modifications to address the deficiency with Department approval and in consultation with DMR and retest the facility as described in Condition 3(E)(2).

b) If upstream and/or downstream performance standards have not been achieved and the results are not close (not within 10% of performance standard criteria for passage efficiency or timing for the tested species), the Applicant shall implement one or more of the following measures no later than 3 years after the distribution of the effectiveness testing report:

1) Upstream passage

i. Design, construct, operate, and maintain a second fishway in the north channel.

ii. Construct, operate, and maintain attraction flow channel(s) for one of the fishways that discharge in the vicinity of the fishway entrance(s) and can convey the amount of required spillflows[137] or a minimum of 20% of station capacity, whichever is greater.

[137] Required by NMFs' BO.

iii. Modifications to the fish lift, including the entrance gate, internal infrastructure, and/or attraction water system.

iv. Modifications to the spillway.

2) Downstream passage

i. Construction of a new downstream fish bypass facility with low-level entrances and surface entrance(s) at the north channel dam. The surface entrance(s) shall include uniform acceleration weirs.

ii. Construction of a new downstream bypass at the south channel dam adjacent to the log sluice with surface and low-level entrances and the capability of passing a minimum of 5% of station hydraulic capacity.

iii. Construction of additional crest gates or other spillway gates.

iv. Modifications to the downstream existing bypass facility.

v. Construction of a plunge pool and/or prioritize spill to areas with sufficient depth and away from rock outcrops or concrete that meet USFWS design criteria (2019 or current version).

c) The Applicant may propose alternative adaptive measures that are subject to review and approval by the Department.

d) The Applicant must repeat adaptive management measures contained in Condition 3(E)(3) until passage effectiveness standards are achieved.

4) RECREATIONAL ACCESS AND USE – SHAWMUT PROJECT

A. The Applicant must continue to provide formal and informal access to the Project waters upstream and downstream of the Project dam for the purpose of recreation in and on the water, for fishing, and for navigation to the extent possible, for the term of a New License.

B. This condition is necessary to ensure that the discharge from the Project will comply with water quality requirements, including 38 M.R.S. § 465(3)(A) and § 465(4)(A), as discussed above at Section 4(A) and (C). Because the discharge affects, among other things, the water level of the impoundment and the flow downstream of the dam, it necessarily affects the water quality requirements of

the designated uses of fishing, recreation in and on the water, and navigation, among others.

5) WATER QUALITY – SHAWMUT PROJECT

Upon any future determination by the Department that operation of the Shawmut Project, as approved by the certification and as conditioned by FERC for the Project, may be causing or contributing to a decline in water quality or non-attainment of water quality standards, the Department reserves the right to, in its discretion and upon notice to the Applicant and opportunity for hearing in accordance with its regulations, reopen this certification to consider requiring modifications to the certification or additional conditions as may be deemed necessary by the Department to ensure that the Project does not cause or contribute to any decline in water quality or non-attainment of water quality standards.

6) STANDARD CONDITIONS

The Applicant must comply with all Standard Conditions attached to the certification, with such compliance to be determined by the Department.

7) LIMITS OF APPROVAL

This approval is limited to and includes the proposals and plans contained in the application and supporting documents submitted and affirmed to the Department by the Applicant. Any variations from the plans and proposals contained in said documents are subject to the review and approval of the Department prior to implementation.

8) COMPLIANCE WITH ALL APPLICABLE LAWS

The Applicant must secure and appropriately comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and Orders required for the operation of the Project, in accordance with the terms and conditions of the certification, as determined by the Department.

9) EFFECTIVE DATE

This water quality certification will be effective concurrent with the effective date of the New License issued by FERC for the Project.

10) SEVERABILITY

In the event any provision, or part thereof, of this certification is declared to be unlawful by a reviewing court, the remainder of the certification will remain in full force and effect and will be construed and enforced in all respects as if such unlawful provision, or part thereof, had been omitted, unless otherwise ordered by the court.

DONE AND DATED AT AUGUSTA, MAINE, THIS ___ DAY OF _____, 2025.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:_____
For: Melanie Loyzim, Commissioner

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

LP/L3153433AN/93705
LP/L1124433QN/93704
LP/L1975133JN/93257
LP/L1747233LN/93706

STANDARD CONDITIONS

1. Noncompliance. Should the project be found, at any time, not to be in compliance with any of the conditions of this approval or should the permittee construct or operate this project in any way other than specified in the application or supporting documents, as modified by the conditions of this approval, then the terms of this approval will be considered to have been violated.

2. Inspection and Compliance. Authorized representatives of the Commissioner or the Attorney General must be granted access to the premises of the permittee at any reasonable time for the purpose of inspecting the operation of the project and assuring compliance with the conditions of this approval.

3. Assignment of Transfer of Approval. This approval will expire upon the assignment or transfer of the property covered by this approval unless written consent to transfer this approval is obtained from the Commissioner. To obtain approval of transfer, the permittee must notify the Commissioner 30 days prior to assignment or transfer of property which is subject to this approval. Pending Commissioner determination on the application for a transfer or assignment of ownership of this approval, the person(s) to whom such property is assigned or transferred must abide by all of the terms and conditions of this approval. To obtain the or Commissioner's approval of transfer, the proposed assignee or transferee must demonstrate the financial capacity and technical ability to (1) comply with all terms and conditions of this approval and (2) satisfy all other applicable statutory criteria.

   A "transfer" is defined as the sale or lease of property which is the subject of this approval or the sale of 50 percent or more of the stock of or interest in a corporation or a change in a general partner of a partnership which owns the property subject to this approval.

DEP INFORMATION SHEET

Appeals to the Board of Environmental Protection

Dated: November 2024

Contact: Clerk.BEP@maine.gov
(207) 314-1458

SUMMARY

This document provides information regarding a person's rights and obligations in filing an administrative or judicial appeal of: (1) a final license decision made by the Commissioner of the Department of Environmental Protection ("DEP"); or (2) an insurance claim-related decision ("Clean-up and Response Fund decision") made by the Commissioner or the Office of State Fire Marshal pursuant to 38 M.R.S. § 568-A.

Except as explained below, there are two methods available to an aggrieved person seeking to appeal a license decision made by the Commissioner or a Clean-up and Response Fund decision: (1) an administrative appeal before the Board of Environmental Protection ("Board"); or (2) a judicial appeal before Maine's Superior Court. An aggrieved person seeking review of a license decision or Clean-up and Response Fund decision made by the Board may seek judicial review in Maine's Superior Court.

An appeal of a license decision made by the DEP Commissioner or the Board regarding an application for an expedited wind energy development (35-A M.R.S. § 3451(4)), a general permit for an offshore wind energy demonstration project (38 M.R.S. § 480-HH(1)), or a general permit for a tidal energy demonstration project (38 M.R.S. § 636-A) must be taken to the Supreme Judicial Court sitting as the Law Court.

I. ADMINISTRATIVE APPEALS TO THE BOARD

LEGAL REFERENCES

A person filing an appeal with the Board should review the applicable rules and statutes, including the DEP's Chapter 2 rule, *Processing of Applications and Other Administrative Matters* (06-096 C.M.R. ch. 2); Organization and Powers, 38 M.R.S. §§ 341-D(4) and 346; and the Maine Administrative Procedure Act, 5 M.R.S. § 11001.

DEADLINE TO SUBMIT AN APPEAL TO THE BOARD

Within 30 calendar days of the date of: (1) a final license decision of the Commissioner; or (2) a Clean-up and Response Fund decision, an aggrieved person may appeal to the Board for review of that decision. "Aggrieved person" means any person whom the Board determines may suffer a particularized injury as a result of a Commissioner's license decision or a Clean-up and Response Fund decision. A complete appeal must be received by the Board no later than 5:00 p.m. on the 30th calendar day of the decision being appealed. With limited exception, untimely appeals will be dismissed.

HOW TO SUBMIT AN APPEAL TO THE BOARD

An appeal to the Board may be submitted via postal mail or electronic mail and must contain all signatures and required appeal contents. An electronic filing must contain the scanned original signature of the appellant(s). The appeal documents must be sent to the following address.

Chair, Board of Environmental Protection
c/o Board Clerk
17 State House Station
Augusta, ME 04333-0017
Clerk.BEP@maine.gov

The DEP may also request the submittal of the original signed paper appeal documents when the appeal is filed electronically. The risk of material not being received in a timely manner is on the sender, regardless of the method used.

At the time an appeal is filed with the Board, the appellant must send a copy of the appeal to: (1) the Commissioner of the DEP (Maine Department of Environmental Protection, 17 State House Station, Augusta, Maine 04333-0017); (2) the licensee, if the appellant is not the licensee; and (3) if a hearing was held on the application, any intervenors in that hearing proceeding. For appeals of Clean-up and Response Fund decisions made by the State Fire Marshal, the appellant must also send a copy of the appeal to the State Fire Marshal. **Please contact the Board Clerk at clerk.bep@maine.gov or DEP staff at 207-287-7688 with questions or for contact information regarding a specific license or Clean-up and Response Fund decision.**

REQUIRED APPEAL CONTENTS

A written appeal must contain the information specified in Chapter 2, section 23(B) or section 24(B), as applicable, at the time the appeal is submitted. **Please carefully review these sections of Chapter 2**, which is available online at https://www.maine.gov/sos/cec/rules/06/chaps06.htm, or contact the Board Clerk to obtain a copy of the rule. Failure to comply with the content of appeal requirements may result in the appeal being dismissed pursuant to Chapter 2, section 23(C) or section 24(C).

OTHER CONSIDERATIONS IN APPEALING A DECISION TO THE BOARD

1. *Be familiar with the administrative record.* Generally, the record on which the Board decides an appeal is limited to the record prepared by the agency in its review of the application, any supplemental evidence admitted to the record by the Board Chair and, if a hearing is held on the appeal, additional evidence admitted during the hearing. A person who seeks to appeal a decision to the Board is encouraged to contact the DEP (or State Fire Marshal for Clean-up and Response Fund decisions made by that agency) to inspect the record before filing an appeal.

2. *Be familiar with the applicable rules and laws.* An appellant is required to identify the licensing criterion or standard the appellant believes was not satisfied in issuing the decision, the bases of the objections or challenges, and the remedy sought. Prior to filing an appeal, review the decision being appealed to identify the rules and laws that are applicable to the decision. An appellant may contact the DEP or Board staff with any questions regarding the applicable rules and laws or the appeal procedure generally.

3. *The filing of an appeal does not operate as a stay to any decision.* If a license has been granted and it has been appealed, the license normally remains in effect pending the processing of the appeal. Unless a separate stay of the decision is requested and granted (*see* Chapter 2, section 23(M)), the licensee may proceed with an approved project pending the outcome of the appeal. Any activity initiated in accordance with the approved license during the pendency of the appeal comes with the risk of not knowing the outcome of the appeal, including the possibility that the decision may be reversed or modified by the Board.

4. *Alternative dispute resolution.* If the appeal participants agree to use mediation or another form of alternative dispute resolution ("ADR") to resolve the appeal and so notify the Board, the Board will not hear the matter until the conclusion of that effort, provided the participants engaged in the alternative dispute resolution demonstrate satisfactory progress toward resolving the issues. *See* Chapter 2, section 23(H) or contact the Board Executive Analyst (contact information below) for more information on the ADR provision.

WHAT TO EXPECT ONCE YOU FILE A TIMELY APPEAL WITH THE BOARD

The Board will acknowledge receipt of each appeal and develop a service list of appeal participants and any interested persons for use in the appeal proceeding. Electronic mail (e-mail) is the preferred method of communication during an appeal proceeding; however, the Board reserves the right to require paper copies of all filings. Once the Board Chair rules on the admissibility of all proposed supplemental evidence, the licensee (if the licensee is not the appellant) may respond to the merits of the appeal. Instructions specific to each appeal will be provided in correspondence from the Board Executive Analyst or Board Chair. Generally, once all filings in an appeal proceeding are complete, the DEP staff will assemble a packet of materials for the Board (Board packet), including a staff recommendation in the form of a proposed Board Order. Once available, appeal participants will receive a copy of the Board packet and an agenda with the meeting location and start time. Once finalized, the meeting agenda will be posted on the Board's webpage https://www.maine.gov/dep/bep/index.html. Appeals will be considered based on the administrative record on appeal and oral argument at a regular meeting of the Board. *See* Chapter 2, Section 23(I). The Board may affirm all or part of the decision under appeal; affirm all or part of the decision under appeal with modifications, or new or additional conditions; order a hearing to be held as expeditiously as possible; reverse the decision under appeal; or remand the decision to the Commissioner or State Fire Marshal, as applicable, for further proceedings.

II. JUDICIAL APPEALS

The filing of an appeal with the Board is not a prerequisite for the filing of a judicial appeal. Maine law generally allows aggrieved persons to appeal final license decisions to Maine's Superior Court (*see* 38 M.R.S. § 346(1); Chapter 2; 5 M.R.S. § 11001; and M.R. Civ. P. 80C). A judicial appeal by a party to the underlying proceeding must be filed with the Superior Court within 30 days of receipt of notice of the Board's or the Commissioner's decision. For any other aggrieved person, an appeal must be filed within 40 days of the date the decision was rendered. An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. *See* 38 M.R.S. § 346(4), the Maine Administrative Procedure Act, statutes governing a particular license decision, and the Maine Rules of Civil Procedure for substantive and procedural details applicable to judicial appeals.

ADDITIONAL INFORMATION

If you have questions or need additional information on the appeal procedure, for administrative appeals contact the Board Clerk at clerk.bep@maine.gov or 207-287-2811 or the Board Executive Analyst at bill.hinkel@maine.gov or 207-314-1458, or for judicial appeals contact the court clerk's office in which the appeal will be filed.

Note: This information sheet, in conjunction with a review of the statutory and rule provisions referred to herein, is provided to help a person to understand their rights and obligations in filing an administrative or judicial appeal, and to comply with notice requirements of the Maine Administrative Procedure Act, 5 M.R.S. § 9061. This information sheet is not intended to supplant the parties' obligations to review and comply with all statutes and rules applicable to an appeal and insofar as there is any inconsistency between the information in this document and the applicable statutes and rules, the relevant statutes and rules apply.