LOW-IMPACT HYDROPOWER POWER INSTITUTE RECERTIFICATION APPLICATION

LIHI CERTIFICATE #118

WEBSTER-PEMBROKE HYDROELECTRIC PROJECT

(FERC NO. 3185 *EXEMPT*)

Prepared for:

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RECERTIFICATION APPLICATION

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(FERC NO. 3185 *EXEMPT*)

1.0 FACILITY DESCRIPTION

The Webster-Pembroke Hydroelectric Project (Project) is located on the Suncook River, approximately one-half mile upstream of the China Mill Dam (RM 0.45) in the towns of Pembroke and Allenstown, Merrimack County, New Hampshire, upstream of the confluence of the Suncook and Merrimack Rivers at river mile (RM) 0.65 (Pembroke Dam) and approximately RM 1.0 (Webster Dam) (Figure 1-1). The Suncook River is 35.7 miles long from its headwaters at the outlet of Crystal Lake to its confluence with the Merrimack River (Figure 1-2). The Suncook River is the town boundary, at the Project, between Pembroke and Allenstown.

The Suncook River, located in central New Hampshire, flows from a northeast to southwest direction, with a total contributing drainage area of 270 square miles. It is a tributary of the Merrimack River (Figure 1-2), which flows to the Gulf of Maine. Shortly before reaching the Merrimack River, the Suncook River drops 70 feet in 0.5 miles – a natural waterpower site that led to the growth of the village of Suncook.

The Project exemption is held by Pembroke Hydro Associates Limited Partnership (Pembroke Hydro LP or Exemptee). The Federal Energy Regulatory Commission (FERC) issued an Order granting exemption from licensing for a small hydroelectric project of 5 MW or less (FERC No. 3185) on February 24, 1983 (Appendix D). Since the Project is FERC exempt, the Project does not have a license, nor a Clean Water Act Section 401 Water Quality Certificate (WQC). The Project is operated as a run-of-river facility and is required to maintain an instantaneous minimum flow release of 25 cfs, or inflow, if less.[1]

[1] The Order granting exemption from licensing for a small hydroelectric project of 5 MW or less (FERC No. 3185) issued in 1938 set the instantaneous minimum flow release to 10 cfs, however, the Memorandum of Agreement

The FERC exemption initially identified an installed capacity of 2.6 MW. The FERC issued an Order Amending Exemption on January 9, 1991, (see Appendix D) changing the total authorized capacity of the facility to 2,750 KW, from 2,600 KW. FERC noted the increase would not result in any adverse environmental effects.

The Project consists of two dams, the Webster Dam, a concrete gravity dam, as the primary impoundment, and the Pembroke Dam, a stone masonry dam located on the bypass section of the Suncook River, receiving the minimum flow release and any spillage from the Webster Dam. The Pembroke Dam is located 1,800 feet (ft.) downstream of the Webster Dam, and the powerhouse currently abuts the Pembroke Dam, approximately 30 ft. downstream of the Main Street Bridge. The Pembroke project consists of utilizing the total hydrostatic head available between the headwater of the Webster Dam, with 4 ft. of pneumatic rubber bladder gates (elevation 277.3 NGVD), and the tailwater of the Pembroke Dam (elevation 226 NGVD) which utilizes a gross head of about 51 ft. Flows are diverted through the existing Webster Canal, through a 460-foot, 8-foot diameter 3/8" welded steel penstock to a full Kaplan Turbine, located in the Pembroke Powerhouse which is immediately downstream of the Pembroke Dam. The reservoir at Webster (known as the Suncook River Reservoir or the Irish Pond Reservoir) has a volume of 147 acre-feet, and a total surface area of 26 acres. Approximately 4.5 acres are occupied by non-reservoir facilities, including the canal, penstock and powerhouse. The reservoir at Pembroke dam has a reservoir storage of 34 acre-feet, and is within the bypassed reach zone of the Project.

The Pembroke and Webster dams were originally constructed in 1860 and 1917, respectively, for the purposes of harnessing hydromechanical (and later hydroelectric) power to produce cloth. In 1868 the China Mill Dam was constructed 600 ft. downstream for the same purpose. In the early 1900s, the Pembroke and Webster facilities were closed, and the hydroelectric equipment removed. The mill buildings were eventually converted into apartments. In 1982, competing applications to redevelop the hydroelectric potential were filed with the FERC and the Pembroke Hydro Corporation was issued the FERC license exemption. On June 28, 2013, wholly owned indirect subsidiaries of Eagle Creek Renewable Energy, LLC (Eagle Creek) acquired all of the

(MOA) between Eagle Creek and the USFWS superseded the FERC Exemption Order, and set the minimum flow release to 25 cfs.

general and limited partnership interests in Pembroke Hydro Associates Limited Partnership from Algonquin Power Fund (America) Inc. and Algonquin Power Fund (America) Holdco Inc.

The closest upstream dam of the Project, the Pittsfield Mill Dam (FERC No.14755), is located approximately 16 miles upstream, while the China Mill Dam is located 0.5 miles downstream. There are more than a dozen dam sites along the Suncook River, built for local industrial uses over time, though it is unclear how many of them are active.

A FERC e-library search was conducted from 2015 – 2020 for the project to determine any areas of non-compliance, and none were discovered.

In August 2014, the United States Fish and Wildlife Service (USFWS) and Eagle Creek (collectively "the Parties") entered into a Memorandum of Agreement (MOA), the purpose of which was to establish a plan and schedule to address fish passage and minimum flows at Eagle Creek's hydroelectric projects in New Hampshire, including the Webster-Pembroke Project.

The MOA was executed with a 5-year term and an option for the Parties to extend the term by mutual agreement. Over the 5-year term, the USFWS and Eagle Creek worked cooperatively to address fish passage and minimum flow issues at the sites. In July 2019, the Parties agreed to an interim extension of the MOA through March 2020 to allow the Parties to conduct site reviews of downstream fish passage facilities and minimum flows with the purpose of extending the MOA for an additional term based on discussions resulting from the site reviews. The revised July 11, 2019 agreement is available as Appendix C. Eagle Creek and the USFWS, along with NHFG, continue discussions to the extend the MOA, with the most recent meeting held in early February 2020.

In the spirit of the MOA, Eagle Creek worked in cooperation with the USFWS and New Hampshire Fish and Game (NHFG) to review Project minimum flows and review downstream fish passage and protection measures at certain sites. The MOA included specific provisions for the Webster-Pembroke Project, as outlined below:

- In 2016, based on consultation and agreement with the USFWS, the Pembroke Hydro LP installed a plunge pool and discharge on the downstream side of the wastegate adjacent to the trashracks at the end of the canal, similar to the arrangement used in years past to accommodate downstream herring passage (see further detail in Section 3.4).

- The Project would also be required to provide downstream eel passage measures within 48 months of notification from NHFG and/or USFWS.
- Based on field testing and observations with the USFWS and NHFG, on July 29, 2015, the minimum flow was changed from a FERC license required 10 cfs to 25 cfs, and no further modifications were required pending additional assessment of flow to be completed in November 2016 with the use of the 8 x 8 drain gate, and the repaired Obermeyer gate. This second assessment was completed in September 2017 due to drought conditions. The agencies confirmed that 25 cfs was acceptable, but want to review the flow in the bypass after the partial removal of the Pembroke dam is completed (see Section 3.7.1 for a further description of the Partial Dam Removal Project). Additionally, during the downstream migration season, an additional 5 cfs is released through the waste gate in a modified stoplog section bay at the downstream end of the canal near the unit intake.

The MOA also includes provisions for the development of an Operations and Flow Monitoring Plan, and a Fishway Operations and Maintenance Plan. The Operations and Flow Monitoring Plan was developed based upon a mutually agreeable schedule that allowed downstream fish passage facilities at certain New Hampshire Projects to first be placed into service. It was prepared and submitted to USFWS and approved in 2017. It was then updated in December 2018. Eagle Creek recently received comments from agencies on the Plan in September 2019. The Operations and Flow Monitoring Plan will be updated based on further discussion with the agencies as Eagle Creek works with the USFWS to extend this MOA. Based on current conversations with the USFWS, these two Plans will be combined, revised, and sent to USFWS for review. All activities under the MOA are coordinated and approved by the USFWS. Pembroke Hydro LP has confirmed they are following the requirements of the MOA.

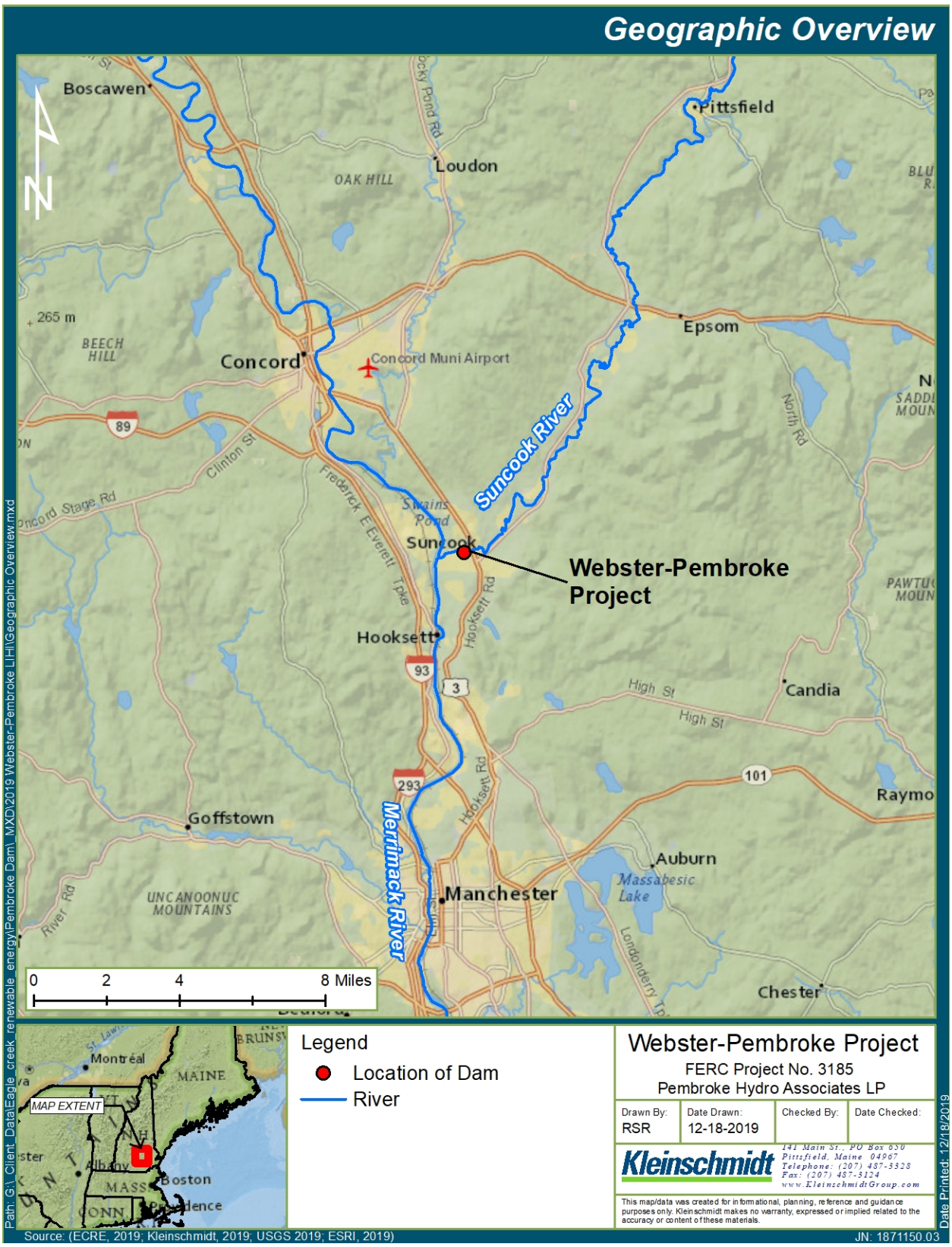

FIGURE 1-1 GEOGRAPHIC OVERVIEW OF PROJECT AREA

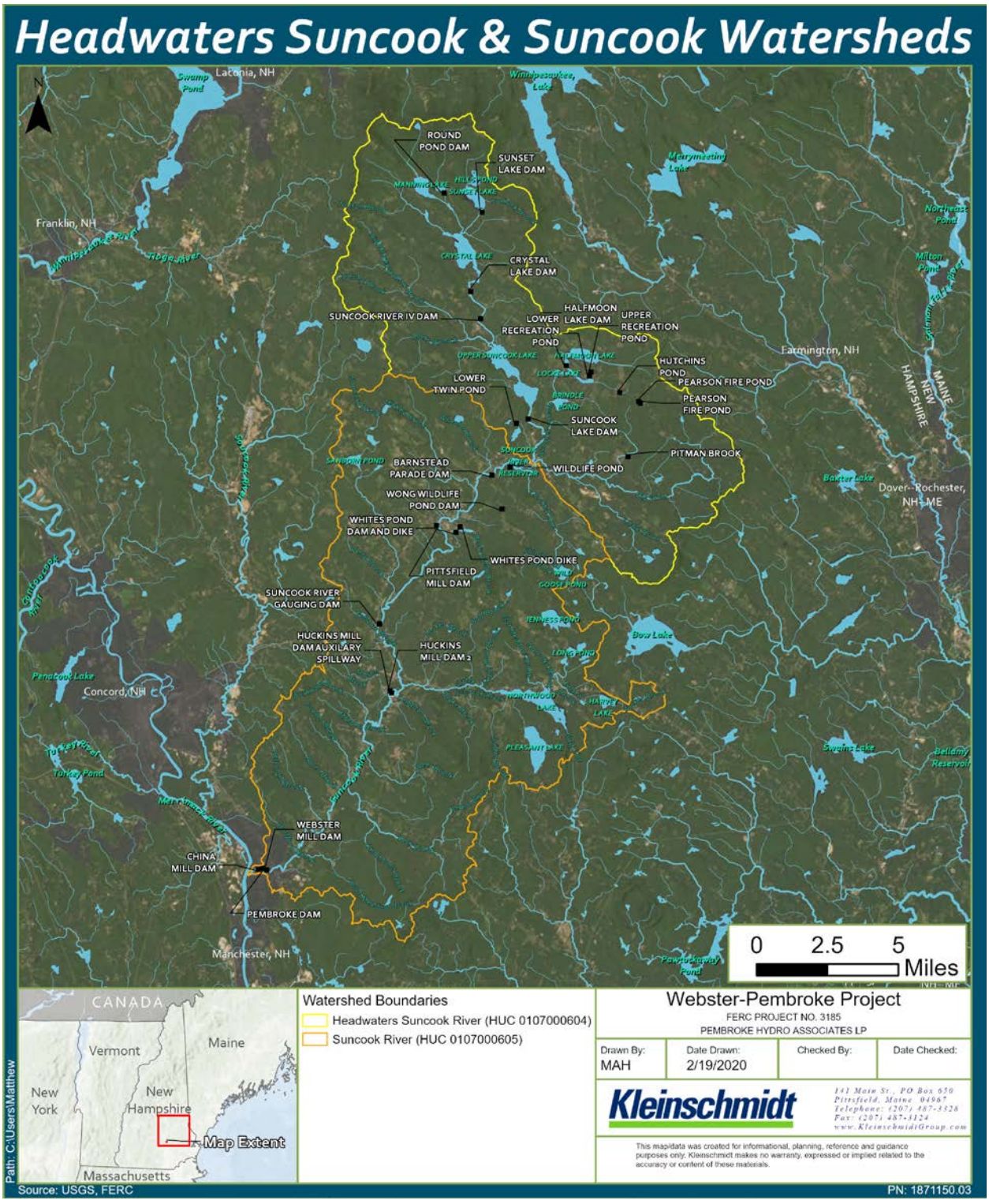

FIGURE 1-2 SUNCOOK RIVER WATERSHED

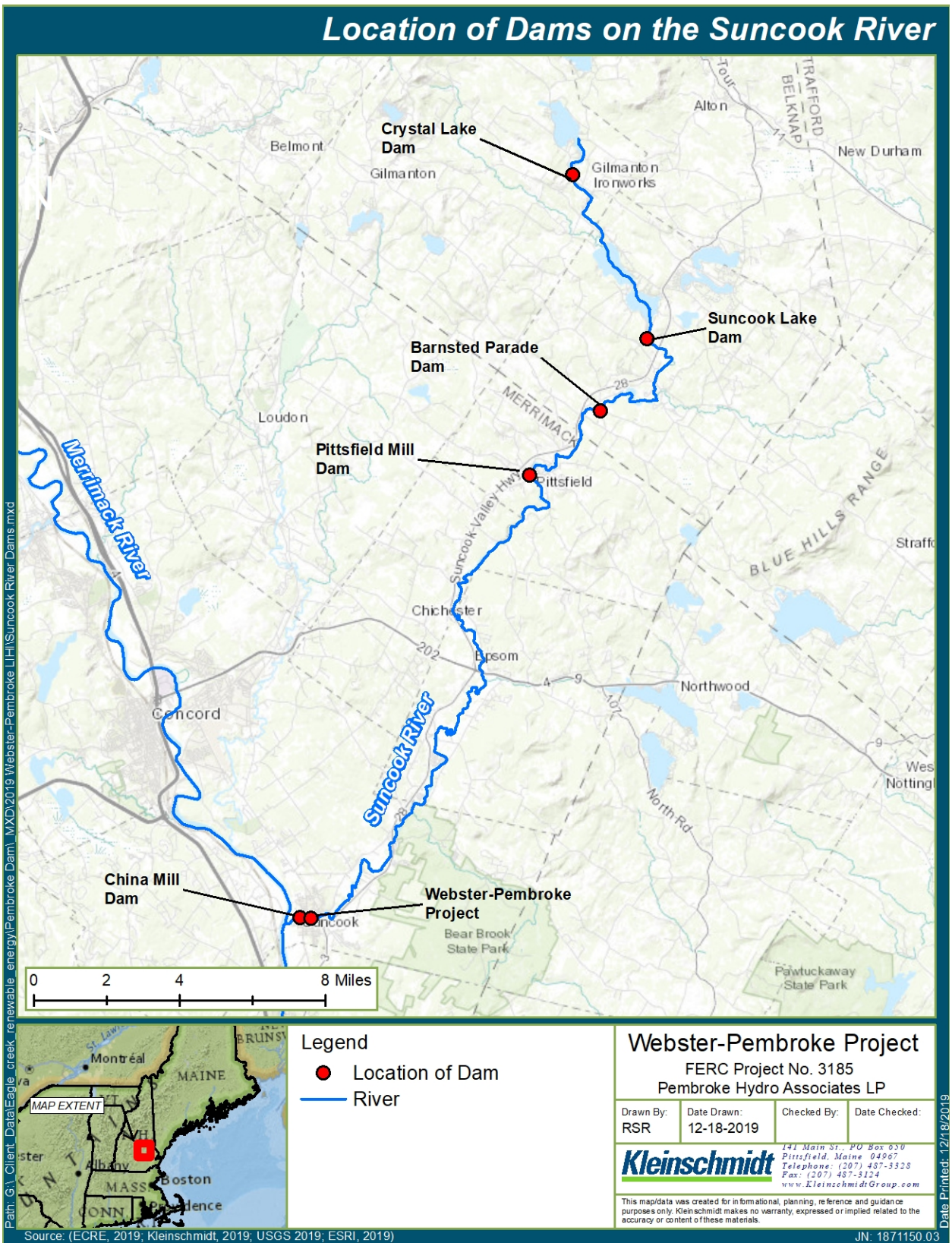

FIGURE 1-3 UPSTREAM AND DOWNSTREAM DAMS ON THE SUNCOOK RIVER

1.1 FACILITY DESCRIPTION INFORMATION FOR THE WEBSTER-PEMBROKE HYDROELECTRIC PROJECT (LIHI CERTIFICATE #118)

INFORMATION TYPE	VARIABLE DESCRIPTION	FACILITY DESCRIPTION
Name of the Facility		Webster-Pembroke Hydroelectric Project (FERC Project No. 3185 or Pembroke) referred to as the Project throughout this application.
Location	River name (U.S. Geologic Survey [USGS] proper name)	Suncook River
	River Mile:	RM 0.65 (Pembroke dam) and RM 1.0 (Webster dam) on the Suncook River
	River Basin:	Suncook River Watershed Basin
	Nearest town, county, and state:	Pembroke and Allenstown, Merrimack County, New Hampshire
	River Mile of Dam above next major river:	Other dams on the Suncook River: Upstream: • Pittsfield Mill Dam near RM 21, • Barnstead Parade Dam near RM 25, • Suncook Lake Dam near RM 29.7, and • Crystal Lake Dam near RM 34. China Mill Dam is located downstream of the Project near RM 0.45. According to the NH Dam Removal and River Restoration Program, no dams on the Suncook River are slated for fish passage projects.[2]
	Geographic latitude:	43° 7'46.16"N
	Geographic longitude:	-71°27'1.50"W

[2] https://www.des.nh.gov/organization/divisions/water/dam/damremoval/projects.htm

INFORMATION TYPE	VARIABLE DESCRIPTION	FACILITY DESCRIPTION
Facility Owner	Application Contact Names	Ms. Susan Giansante Eagle Creek Renewable Energy, LLC. Robert A. Gates Vice President Pembroke Hydro Associates Limited Partnership 65 Madison Ave, Suite 500 Morristown, NJ 07960
	Facility owner (individual and company names):	Pembroke Hydro Associates Limited Partnership Authorized Representative: Robert A. Gates
	Representative in LIHI certification	Nuria V. Holmes Kleinschmidt Associates 1500 NE Irving Street, Suite 550 Portland, OR 97232
Regulatory Status	FERC Project Number and Issuance and expiration dates	FERC Project No. P-3185 On February 24, 1983 the Project became FERC exempt.
	FERC license type or special classification (e.g., "qualified conduit")	Exempt
	Water Quality Certificate identifier and issuance date, plus source agency name	N/A
	Hyperlinks to key electronic records on FERC e-library website (e.g., most recent Commission Orders, WQC, ESA documents, etc.)	February 24, 1983 Order Granting Exemption from Licensing of a Small Hydroelectric Project of 5 MW or Less (not available on FERC eLibrary) (Appendix D).
Power Plant Characteristics	Date of Initial Operation (past or future for operational applications)	Pembroke was exempt by FERC in 1983, and generation began again in 1985. The facility was originally commissioned in 1860 (Pembroke Dam) and 1917 (Webster Dam).

INFORMATION TYPE	VARIABLE DESCRIPTION	FACILITY DESCRIPTION
	Total name-plate capacity	2.75 MW[3]
	Average annual generation (MWh)	11,601,385 kW (2019) 9,960,590 kW (2018) 8,618,400 kW (2017) 7,231,320 kW (2016) 7,066,550 kW (2015) Average: 8,895,649 kW (8895 MWh)
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	The Project powerhouse contains one Horizontal Kaplan Turbine, with a minimum and maximum hydraulic capacity of 100 cfs and 800 cfs, respectively.
	Modes of operation (run-of-river, peaking, pulsing, seasonal storage, etc.)	Run-of-river[4] – No change since last certification.
	Trashrack clearance and spacing (inches) for each trashrack:	Spacing: 2-inches at the penstock intake at the downstream end of the canal.
	Dates and types of major equipment upgrades	No major equipment upgrades have occurred at the Project since the last certification.
	Dates, purpose, and type of any recent operational changes	As part of the MOA, in 2015, the bypass flow from the waste gate at the dam was increased to 25 cfs (from 10 cfs), and during the downstream fish passage season, an additional 5 cfs is released from the waste gate at the downstream end of the canal near the intake.

[3] The FERC issued an Order Amending Exemption on January 9, 1991, changing the total authorized capacity of the facility to 2,750 KW, from 2,600 KW. FERC noted the increase would not result in any adverse environmental effects.

[4] The LIHI 2nd Edition Handbook characterizes a "run-of-river" facility as one in which the outflow of the facility is within reasonable measurement accuracy (+/- 10%) of the inflow of the facility, measured on an hourly basis.

INFORMATION TYPE	VARIABLE DESCRIPTION	FACILITY DESCRIPTION
	Plans, authorization, and regulatory activities for any facility upgrades	Pembroke Hydro LP proposes to amend the exemption to partially remove a portion of the stacked stone blocks that form the stone masonry Pembroke Dam. On September 20, 2019, FERC determined that this undertaking would adversely affect the Pembroke Dam, which is a contributing feature of the Pembroke Mill, listed in the National Register of Historic Places. Removing the stones is necessary to ensure high flows no longer overtop Pembroke Dam and to ensure renters occupying the bottom level of the building located adjacent to the Pembroke Dam's right abutment are not flooded. FERC and the Exemptee, in consultation with the New Hampshire State Historic Preservation Officer (New Hampshire SHPO), developed a MOA[5] with a plan to mitigate the adverse effect, on the Project. The MOA states that FERC would ensure the proposed mitigation measures are carried out by the Exemptee and in consultation with the New Hampshire SHPO. Pembroke Hydro LP has not completed the partial dam removal. Permits have been acquired, and Pembroke Hydro LP is waiting on FERC to issue the Order for the partial dam removal.
Characteristics of Dam, Diversion of Conduit	Date of construction	1860 (Pembroke Dam) and 1917 (Webster Dam) (Data acquired from FERC Dam Safety Report 2018)[6]
	Dam height	Webster Dam: 20.4 ft. (Total of 13 ft. concrete, plus 4-ft. pneumatic rubber bladder gates. Pembroke Dam: 18 ft.
	Dam width	Webster Dam: 250 ft. long Pembroke Dam: 77 ft. long

[5] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15360086
[6] https://elibrary.ferc.gov/IDMWS/Doc_Family.asp?document_id=14791921 (CEII Protected)

INFORMATION TYPE	VARIABLE DESCRIPTION	FACILITY DESCRIPTION
	Spillway elevation (crest) and hydraulic capacity	Webster Dam: 277.3 ft. NGVD • The crest of the spillway is at elevation 273.0 feet. The Exemptee has installed 4-foot-high pneumatic rubber bladder gates at the crest and along the entire length of the spillway. • The crest gates installed on the Webster spillway are 4-foot-high and 154-foot-long and are equipped with a rubber control bladder that is operated by a pneumatic control system. When flows reach about a ½ foot over the top of the pneumatic rubber bladder gates, they are lowered. Pembroke Dam: 244.feet NGVD • The spillway consists of two sections at approximately right angles. One section is perpendicular to river flow while the other section is parallel to the river flow. Zero Freeboard Hydraulic capacity:[7] • Webster: 11,010 cfs at 280.4 feet NGVD • Pembroke: 1,848 cfs 247.9 feet NGVD (estimated)
	Tailwater (downstream water surface) elevation	226 ft. NGVD at the Pembroke Dam (Furthest downstream dam)
	Length and type of all penstocks and water conveyance structures between reservoir and powerhouse	One (1) 460-foot-long, 8-foot diameter, 3/8" welded steel penstock. The penstock runs from the downstream end of the canal, under Mill Falls Road and passes through the Suncook River into a concrete casing adjacent to the Pembroke dam before entering the powerhouse. The powerhouse is a concrete structure downstream of the Pembroke Dam. The powerhouse is 20 feet wide by 60 feet long. The powerhouse houses the 2.75 MW generating unit.

[7] This is the amount of flow the spillway can pass when the pool elevation is at the crest of the dam.

INFORMATION TYPE	VARIABLE DESCRIPTION	FACILITY DESCRIPTION
	Dates and types of major, generation-related infrastructure improvements	No major, generation-related infrastructure improvements have occurred since the facility was completed in 1985.
	Designated facility purposes	Generation of Power
	Water source	Suncook River – a body of water fed by Crystal Lake and sufficient springs, rainwater, and snowmelt.
	Receiving Water and Location of Discharge	Pembroke discharges water from its powerhouse which abuts the Pembroke dam.
Characteristics of the Reservoir and Watershed	Gross storage volume and surface area at full pool:	Webster dam has a surface area of 147-acre-feet at a normal maximum pool elevation of 277.3 feet NGVD. Pembroke dam has a surface area of 34 acre-feet at normal maximum pool elevation of 244.1 feet NGVD. These values have not changed since the last certification.
	Maximum water surface elevation (ft. MSL)	The Webster and Pembroke dams have a maximum WSEL of 277.3 and 244.1, respectively. These values have not changed since the last certification.
	Maximum and minimum volume and water surface elevations for designated power pool, if available	N/A This is a run of river project; the pond is maintained at 277.3 MSL
	Canal Gatehouse	The canal gatehouse is a concrete structure that is 18-foot-wide by 24-foot-long. There are head gate piers on the upstream side of the gatehouse. The canal gatehouse houses 4 canal intake gates.

INFORMATION TYPE	VARIABLE DESCRIPTION	FACILITY DESCRIPTION
	Power Canal	The power canal is 500-foot-long, 14-foot-deep and 24-foot-wide and constructed of concrete. The canal has an invert of 266.5 feet with the top of the canal concrete walls at elevation 280.4 feet. The terminus of the canal is the penstock intake which is a concrete structure that includes a trash rack and a trash rake. The downstream end of the left canal wall is comprised of a sluice gate and a modified sluice gate used for downstream fish passage.
	Canal Sluiceway	The canal sluiceway is approximately 170-foot-long, approximately 20-foot-wide and runs from the canal sluice gate until it rejoins the Suncook River. The canal sluiceway runs adjacent to a residential property on the right bank. The walls of the canal sluiceway are formed by stone masonry walls.
	Upstream dam(s) by name, ownership, FERC number (if applicable), and river mile	Major dams located on the Suncook River upstream of Pembroke include the following dams all owned by the State of New Hampshire: • Pittsfield Mill Dam near RM 21[8], • Barnstead Parade Dam near RM 25, • Suncook Lake Dam near RM 29.7, and • Crystal Lake Dam near RM 34.
	Downstream dam(s) by name, ownership, FERC number (if applicable), and river mile	There is one dam located on the Suncook River downstream of Pembroke the privately-owned China Mill Dam, located at approximate RM 0.45, and is the last dam before the Suncook's confluence with the Merrimack River (approx. 0.5 miles downstream from Pembroke).

[8] On March 29, 2004, Suncook Leathers, Inc. (Exemptee) filed an application to surrender its exemption from licensing for its existing, non-operational hydropower facilities. The Exemptee requested the surrender because they have determined that the project is no longer profitable to operate. Operation of the project ceased on September 1, 2002. https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=10187665

<table>
<tr><th>INFORMATION TYPE</th><th>VARIABLE DESCRIPTION</th><th>FACILITY DESCRIPTION</th></tr>
<tr><td></td><td>Operating agreements with upstream or downstream reservoirs that affect water availability, if any, and facility operation</td><td>The Project does not operate under any agreements made with upstream or down facilities.</td></tr>
<tr><td></td><td>Area inside FERC project boundary, where appropriate</td><td>Approx. 30 acres</td></tr>
<tr><td rowspan="2">Hydrologic Setting</td><td>Average annual flow at the dam</td><td>The average annual flow as measured at the upstream gage USGS 01089925 SUNCOOK RIVER AT NH 28, NEAR SUNCOOK, NH is 407 cfs (Jan. 2016 to Feb. 2020).</td></tr>
<tr><td>Average monthly flows (cfs)</td><td>Average daily flows by month at the Project (Data from USGS 01089925 SUNCOOK RIVER AT NH 28, NEAR SUNCOOK, NH) in cfs:
<table>
<tr><th>Month</th><th>Min. Daily</th><th>Mean Daily</th><th>Max Daily</th></tr>
<tr><td>January</td><td>174</td><td>531</td><td>2080</td></tr>
<tr><td>February</td><td>176</td><td>547</td><td>2360</td></tr>
<tr><td>March</td><td>224</td><td>582</td><td>1430</td></tr>
<tr><td>April</td><td>182</td><td>790</td><td>2420</td></tr>
<tr><td>May</td><td>81</td><td>444</td><td>1230</td></tr>
<tr><td>June</td><td>26</td><td>234</td><td>1630</td></tr>
<tr><td>July</td><td>15</td><td>88</td><td>509</td></tr>
<tr><td>August</td><td>8</td><td>168</td><td>1350</td></tr>
<tr><td>September</td><td>7</td><td>106</td><td>771</td></tr>
<tr><td>October</td><td>10</td><td>278</td><td>3240</td></tr>
<tr><td>November</td><td>127</td><td>627</td><td>2190</td></tr>
<tr><td>December</td><td>94</td><td>491</td><td>2260</td></tr>
<tr><td>Average:</td><td>94</td><td>407</td><td>1789</td></tr>
</table>
*Time period for data: 2016-01-01 to 2020-02-04</td></tr>
</table>

INFORMATION TYPE	VARIABLE DESCRIPTION	FACILITY DESCRIPTION
	Location and name of relevant stream gauging stations above and below the facility	Upstream approx. 4 miles: USGS Gage 01089925 Suncook River at NH 28, near Suncook, NH Upstream approx. 16 miles: USGS Gage 01089500 Suncook River at North Chichester, NH (Operated in coordination with NHDES) The next downstream gage is the on Merrimack River in Hookset, NH approx. 3 miles downstream: USGS 01090000 Merrimack River at Main Street, Hooksett, NH.
	Watershed area at the dam	259 square miles[9]
Designated Zones of Effect	Number of zones of effect	3
	Upstream and downstream locations by river miles	**Impoundment:** RM 2.65 to RM 1.0 **Bypass Reach**: RM 1.0 to RM 0.72 **Tailrace:** RM 0.72 to RM 0.6
	Type of waterbody (river, impoundment, by-passed reach, etc.)	The waters located within the Impoundment ZOE are classified as "Lake" by the USFWS National Wetlands Inventory (Classification code L1UBHb[10]). The waters within the tailrace are classified as "Riverine" by the USFWS National Wetlands Inventory (Classification code R2UDH[11]) (USFWS 2016). An Information for Planning and Consulting (IPaC) report (Appendix E) was completed for the facility area and detected "riverine" and "freshwater pond" wetlands at the Webster-Pembroke site. These types of wetlands are typically considered outside of the ordinary high-water line.

[9] FERC 2018 Dam Safety Inspection Report
[10] L1UBHb = Lacustrine (L), Limnetic (1), Unconsolidated Bottom (UB), Permanently Flooded (H), Diked/Impounded (h).
[11] R2UBH = Riverine (R), Lower Perennial (2), Unconsolidated Bottom (UB), Permanently Flooded (H)

INFORMATION TYPE	VARIABLE DESCRIPTION	FACILITY DESCRIPTION
	Delimiting structures	Zone of Effect #1: **Impoundment** • The Project currently has an impoundment (Irish Pond) with a volume of 147 acre-feet and a surface area of 26 acres at normal pool elevation of 277.3 feet NGVD. Zone of Effect #2: **Bypass Reach** • The Project's 1,800-foot-long bypass reach extends from the Project's Webster Dam to the Project's powerhouse which abuts the Pembroke Dam. Zone of Effect #3: **Tailrace** • The Project's 300-foot-long tailrace extends from the Project's powerhouse downstream, ending approximately 300 feet before the China Mills Dam impoundment begins.
	Designated uses by state water quality agency	According to NHDES, the Lower Suncook River, specifically in the area of the Webster Mill and Pembroke Dam, is designated as Category 2-G for Drinking Water After Adequate Treatment, and 4A-M for Fish Consumption, due to high levels of mercury.[12] There is insufficient data for Recreation, Aquatic Life, Wildlife, and Boating.
Additional Contact Information:	Names, addresses, phone numbers, and e-mail for local state and federal resource agencies	See Section 4 for the Project Contacts Form.
	Names, addresses, phone numbers, and e-mail for local non-governmental stakeholders	See Section 4 for the Project Contacts Form.
Photographs of the Facility	Photographs of key features of the facility and each of the designated zones of effect	Please see Figure 1-4 for key Project features and Figure 2-1 for Project Zones of Effect. See Appendix A for photographs of key features of the facility.

[12] https://www.des.nh.gov/organization/divisions/water/wmb/rivers/documents/suncook-305b-303d-listings.pdf (Pages 11 and 12)

INFORMATION TYPE	VARIABLE DESCRIPTION	FACILITY DESCRIPTION
	Maps, aerial photos, and/or plan view diagrams of facility area and river basin	

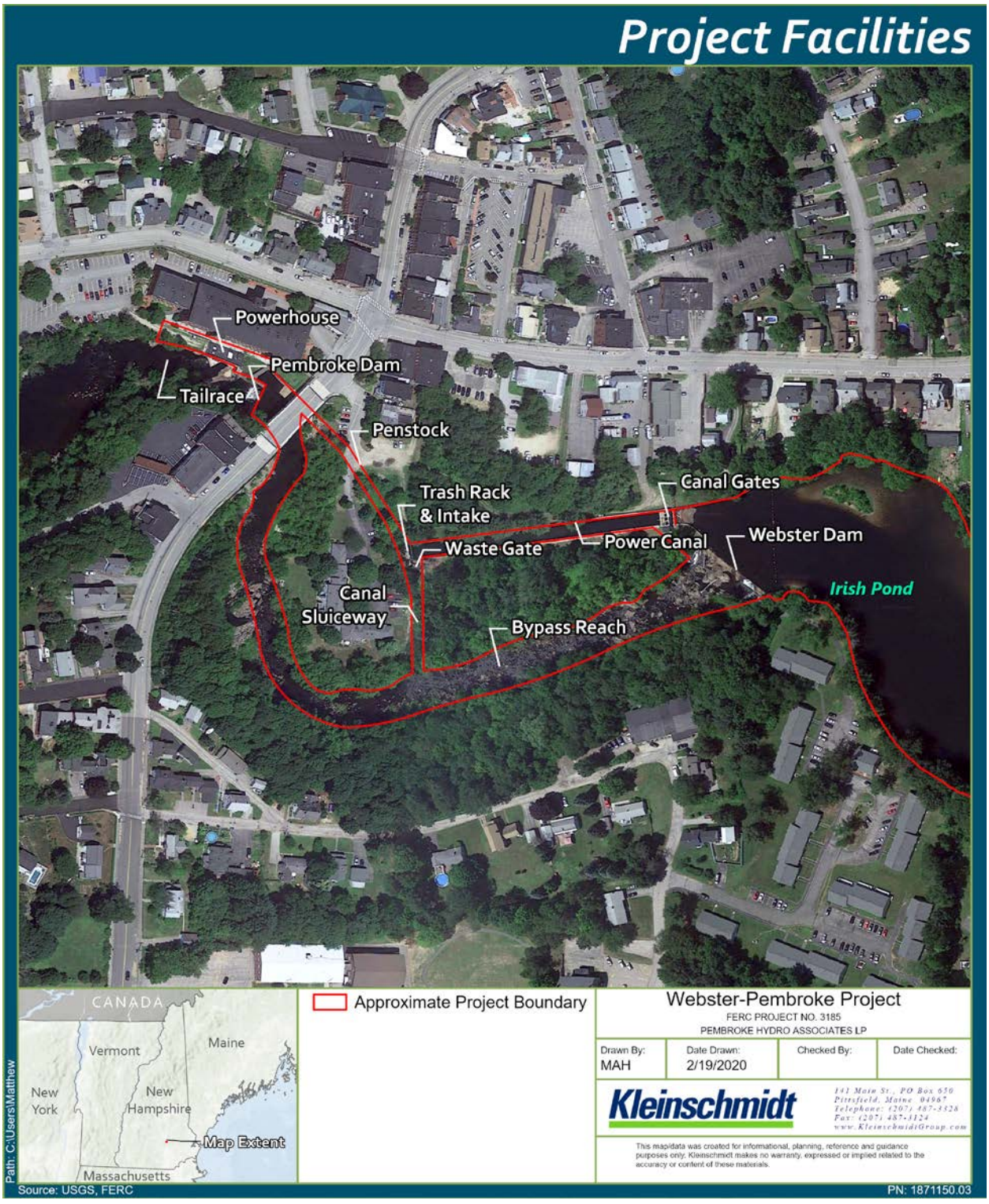

FIGURE 1-4 PROJECT FACILITY DETAILS

2.0 STANDARDS MATRICES

2.1 ZONE OF EFFECT: IMPOUNDMENT ZOE

CRITERION		ALTERNATIVE STANDARDS				
		1	2	3	4	PLUS
A	Ecological Flow Regimes	X				
B	Water Quality	X				
C	Upstream Fish Passage	X				
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection	X				
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources			X		

2.2 ZONE OF EFFECT: BYPASS REACH ZOE

CRITERION		ALTERNATIVE STANDARDS				
		1	2	3	4	Plus
A	Ecological Flow Regimes		X			
B	Water Quality	X				
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection	X				
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources			X		

2.3 ZONE OF EFFECT: TAILRACE ZOE

CRITERION		ALTERNATIVE STANDARDS				
		1	2	3	4	Plus
A	Ecological Flow Regimes		X			
B	Water Quality	X				
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection	X				
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources			X		

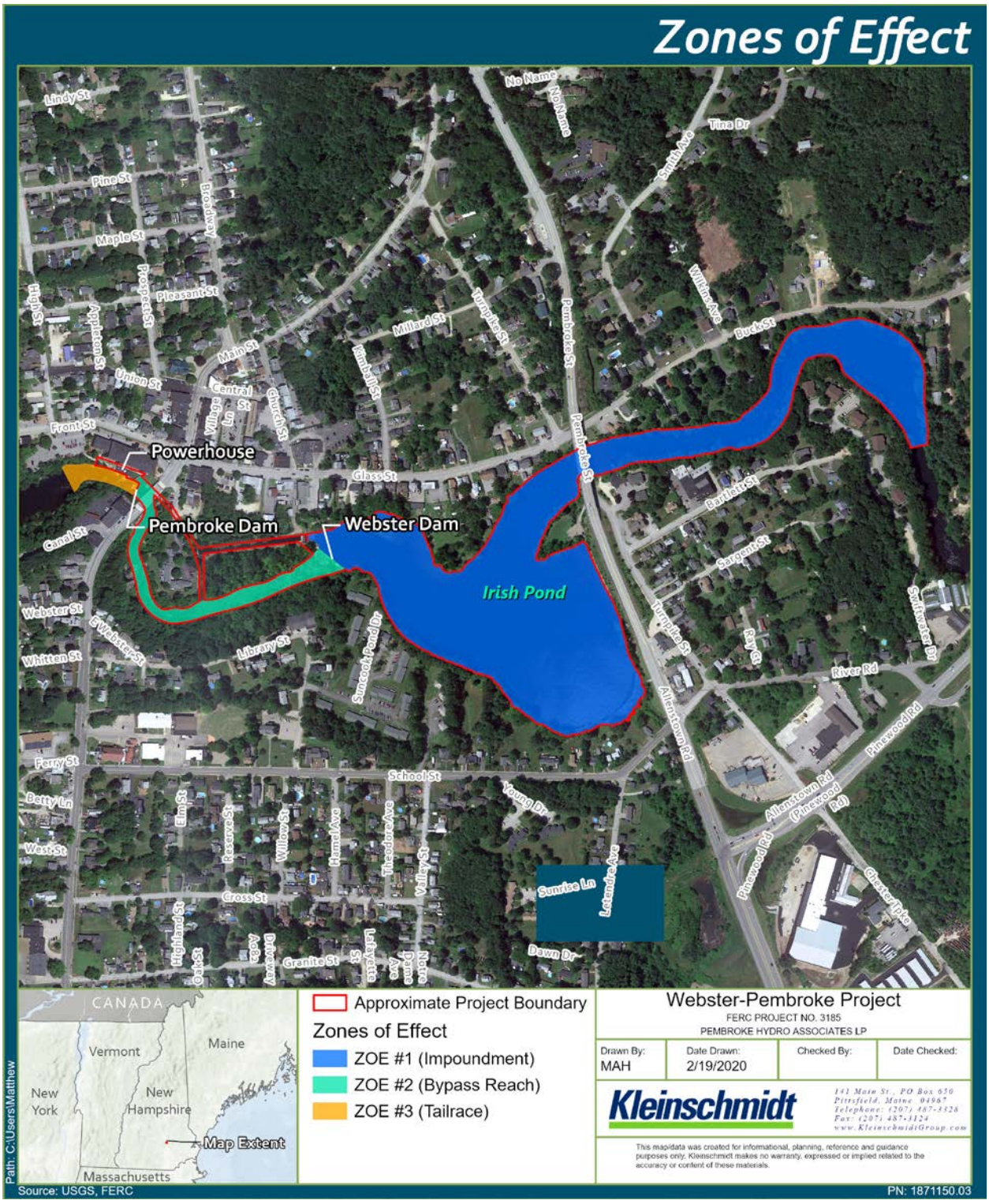

FIGURE 2-1 DESIGNATED ZONES OF EFFECTS FOR THE PROJECT

3.0 SUPPORTING INFORMATION

3.1 ECOLOGICAL FLOW STANDARDS

3.1.1 IMPOUNDMENT

CRITERION	STANDARD	INSTRUCTIONS
A	1	Not Applicable/ De Minimis Effect: • Confirm the location of the powerhouse relative to dam/diversion structures and demonstrate that there are no bypassed reaches at the facility. • For run-of-river facilities, provide details on operations and demonstrate that flows, water levels, and operation are monitored to ensure such an operational mode is maintained. If deviations from required flows have occurred, discuss them and the measures taken to minimize reoccurrence. • In a conduit facility, identify the source waters, location of discharge points, and receiving waters for the conduit system within which the hydropower facility is located. This standard cannot be used for conduits that discharge to a natural waterbody. • For impoundment zones only, explain water management (e.g., fluctuations, ramping, refill rates) and how fish and wildlife habitat within the zone is evaluated and managed. NOTE: this is required information, but it will not be used to determine whether the Ecological Flows criterion has been satisfied. All impoundment zones can apply Criterion A-1 to pass this criterion.

On February 24, 1983, FERC issued an Order Granting Exemption from Licensing for a Small Hydroelectric Project of 5 MW or Less (to the Pembroke Hydro Corporation) and Denying Major License Application (to the Suncook Hydro Corporation) (Exemption Order). No Water Quality Certificate was issued according to the applicant and FERC record. The Project commenced commercial operation in 1985.

The powerhouse is located adjacent to the Pembroke Dam and downstream of the Webster Dam, therefore, a small portion of the Suncook River is bypassed by the project works.

The Project is operated run-of-river. The Project consists of two dams, the Webster Dam, a concrete gravity dam, as the primary impoundment, and the Pembroke Dam, a stone masonry dam located on the bypass section of the Suncook River, receiving the minimum flow release and any spillage from the Webster Dam. The Pembroke Dam is located 1,800 feet (ft.)

downstream of the Webster Dam, and the powerhouse currently abuts the Pembroke Dam, approximately 30 ft. downstream of the Main Street Bridge. The Pembroke project consists of utilizing the total hydrostatic head available between the headwater of the Webster Dam, with 4 ft. of pneumatic rubber bladder gates (elevation 277.3 NGVD), and the tailwater of the Pembroke Dam (elevation 226 NGVD) which utilizes a gross head of about 52 ft.

The reservoir at Webster (known as the Suncook River Reservoir or the Irish Pond Reservoir) has a volume of 147 acre-feet, and a total surface area of 26 acres. Approximately 4.5 acres are occupied by non-reservoir facilities, including the canal, penstock and powerhouse. The reservoir at Pembroke dam has a reservoir storage of 34 acre-feet, and is within the bypassed reach zone of the Project.

Article 2 of the Exemption Order requires compliance with the terms and conditions specified by Federal and State Fish and Wildlife agencies.[13]

The flow recommendation for the site was issued in the exemption on February 24, 1983, and required the facility to maintain an instantaneous minimum flow release of 10 cfs in the bypassed section of the river between the Webster Dam and Pembroke Dam and below the tailrace. Most recently, Eagle Creek entered into a Memorandum of Agreement (MOA) with the USFWS to establish a plan and schedule for addressing fish passage and minimum flow issues at Eagle Creek's hydroelectric projects in New Hampshire. An interim extension of the MOA was executed by both parties on July 11, 2019 extending the term of the current MOA through March 31, 2020 (Appendix D).

- Under this MOA, the Pembroke Project is required, for the protection and enhancement of fish and aquatic habitat, to provide continuous minimum flows in the bypass reach. In July 2015, Eagle Creek, the USFWS and NHFG completed a flow demonstration at the site where it was agreed to increase the FERC license required bypass flow at the Webster Dam from 10 cfs to 25 cfs, pending an additional assessment of the flow in 2016. Due to drought conditions in 2016 and a delay in replacing the drain gate in the dam, the discharge point for the bypass flow, due to high flows in the fall of 2017, the follow up flow demonstration was completed in September 2018 confirming that the previously agreed upon bypass flow of 25 cfs at the dam and 5 cfs released during the downstream migration season from the sluice gate within the stop log sections near the intake at the downstream end of the canal were acceptable. The 2019 interim extension of the MOA between Eagle Creek and the USFWS , as well as the 2018 email from USFWS document acceptance of the change in the bypass flow (see Appendix B). USFWS and NHFG personnel met Eagle Creek on site to observe three different flows (25 cfs, 37 cfs, 50 cfs), which were released into the bypass reach from the newly installed waste gate located at the dam. Qualitative observations were recorded at 25 cfs and 50 cfs (37 cfs was not observed based on input from USFWS). The wetted perimeter and depth did not change significantly. Eagle Creek agreed to continue to release a minimum flow of approximately 25 cfs from the Webster Dam into the bypass reach, or inflow if less, and 5 cfs from the modified waste gate at the downstream end of the canal during the migration season. USFWS further requested a follow up assessment of the

[13] The terms and conditions set forth by these agencies were included in the historic FERC filings (eLibrary), but are unavailable for review online.

bypass once the partial removal of the Pembroke dam is complete. The Exemptee will coordinate with USFWS and NHFG to schedule this site review upon the project's completion.

- Following that site visit, Eagle Creek had erroneously noted that the flow through the canal sluiceway was 20 cfs. This was later corrected via e-mail (see Appendix B).
- Under the terms of the MOA, Eagle Creek was to prepare and file for approval by the USFWS, an Operations and Flow Monitoring Plan for monitoring the run-of-river operation and bypass flows. The Operations and Flow Monitoring Plan was developed based upon a mutually agreeable schedule that allowed downstream fish passage facilities at certain New Hampshire Projects to first be placed into service. The Operations and Flow Monitoring Plan was prepared and submitted to USFWS and approved in 2017. It was then updated in December 2018. Eagle Creek recently received comments from agencies on the Plan in September 2019. The Operations and Flow Monitoring Plan will be updated based on further discussion with the agencies as Eagle Creek works with the USFWS to extend this MOA.

On February 27, 2019, Pembroke Hydro LP submitted a proposal to FERC for a partial removal of the Pembroke Dam. The Pembroke Dam is a stone masonry dam and is located downstream of the Webster Dam. It received minimum flow and spillway releases from the Webster Dam. Although part of the Project, the Pembroke Dam is not a primary water retaining structure and is not required for continued hydroelectric project operations. A low-level waste gate located at the base of the Pembroke Dam was previously removed and remains open at all times. The Webster Dam's minimum flow release passes through this opening, and the Pembroke Dam does not impound water during normal conditions. During high-flow conditions, the flow in the bypass reach can exceed the capacity of the low-level opening and impounded water will rise to spill over the crest of the Pembroke Dam. High-flow conditions in the last decade have caused overtopping of the Pembroke Dam's right abutment (a stone masonry and concrete training wall located along the right bank) (Photo 5-8). Both FERC and the New Hampshire Dam Bureau recommended a partial removal of this dam.

- On May 9, 2019, FERC issued a Notice of Application Accepted for Filing, Soliciting Comments, Motions to Intervene, and Protests for the dam removal.[14] This partial dam removal triggered consultation with the New Hampshire State Historic Preservation Officer, which resulted in a Memorandum of Agreement, as the Pembroke Dam was determined to be a contributing features of the Pembroke Mill, which is listed on the National Register of Historic Places under Section 106 of the National Historic Preservation Act (see more information in Section 3.7).

- On July 9, 2019, Pembroke Hydro LP submitted the Memorandum of Agreement between FERC, the New Hampshire State Historic Preservation Officer, and Eagle Creek, for the partial dam removal (see Appendix F).[15]

- On August 9, 2019, FERC issued the notice of the partial dam removal's adverse effect, and provided the draft MOA to the Advisory Council on Historic Preservation. The

[14] https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=15242072
[15] https://elibrary.ferc.gov/idmws/file_list.asp?document_id=14784438

Commission and the Exemptee, in consultation with the New Hampshire SHPO, developed a plan to mitigate the adverse effect to the historic property and included it in the enclosed draft Memorandum of Agreement (MOA) for the Webster Pembroke Hydroelectric Project.[16] The Commission noted they will ensure that all the measures stipulated in the MOA are executed to resolve adverse effects to the historic property. The Advisory Council was given 15 days to reply or comment. No replies or comments were received.

- With no replies or comments received from the Advisory Council, on September 20, 2019, the New Hampshire SHPO issued the MOA for the partial dam removal for signature.[17]

- On September 27, 2019, Eagle Creek submitted the executed MOA for partial dam removal.[18]

- On October 24, 2019, The Advisory Council submitted their letter requesting a final Memorandum of Agreement developed in consultation with the New Hampshire State Historic Preservation Office.[19]

- Pembroke Hydro LP is still waiting on FERC's amendment for the partial dam removal.

[16] https://elibrary.ferc.gov/idmws/file_list.asp?document_id=14791327
[17] https://elibrary.ferc.gov/idmws/file_list.asp?document_id=14800736
[18] https://elibrary.ferc.gov/idmws/file_list.asp?document_id=14802466
[19] https://elibrary.ferc.gov/idmws/file_list.asp?document_id=14808999

3.1.2 ECOLOGICAL FLOW STANDARDS

3.1.2.1 BYPASS REACH AND TAILRACE

CRITERION	STANDARD	INSTRUCTIONS
A	2	Agency Recommendation: • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. • Explain how the recommendation relates to agency management goals and objectives for fish and wildlife. • Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations).

As noted above, under the 2019 interim extension of the MOA between Eagle Creek and the USFWS, the Exemptee is required, for the protection and enhancement of fish and aquatic habitat, to provide continuous minimum flows of 25 cfs, or inflow if less, in the bypass reaches of the Project. Additionally, during the downstream migration season, an additional 5 cfs is released through the waste gate in a modified stoplog section bay at the downstream end of the canal near the unit intake. See further detail in Impoundment ZOE.

The mean annual flow at the site is 407 cfs (Jan. 2016 to Feb. 2020) with great seasonal variations from an instantaneous high in excess of 13,000 cfs (March 1936) to average daily lows of about 3 cfs.

The operator is typically at the site for several hours each day and confirms run-of-river operations and minimum flow compliance. The headpond of the plant is controlled by the Webster Dam, where water is conveyed into the power canal.

- Under normal conditions, 25 cfs min flow is released from the drain gate (which was replaced in 2018) located at Webster Dam, or inflow, whichever is less, into the bypass reach. The gate is set manually and remains in position.
- During the downstream migration season, an additional 5 cfs is released through the waste gate in a modified stoplog section bay at the downstream end of the canal near the unit intake.
- Under drawdown conditions, minimum flow is maintained through the drain gate located at the dam. The headpond at the dam is never drawn down below the invert of the drain gate.

- Generation is controlled automatically by a PLC to maintain the head pond elevation at the top of the Obermeyer gate, which is affixed to the top of the Webster dam. The unit is manually started, and the PLC adjusts generation based on a head pond level sensor located at the Webster dam to maintain the head pond elevation such that inflow equals outflow.
    - If inflow is less than the hydraulic capacity of the unit (100 cfs), generation is shut off, and inflow passes over the top of the Obermeyer gate.
    - If the unit trips off line, or is taken out of service for maintenance, inflow is passed by the Obermeyer gate.
    - If inflow is greater than the hydraulic capacity of the unit, the Obermeyer gate is manually operated to pass the balance of flow at the Webster dam and maintain a constant head pond level.
- During drawdown conditions, run of river is provided through a combination of generation and the drain gate at the dam and/or the waste gate installed within the existing stop log bay at the downstream end of the canal to maintain the headpond at the dam at the target drawdown level.

3.2 WATER QUALITY STANDARDS

3.2.1 ALL ZOES

CRITERION	STANDARD	INSTRUCTIONS
B	1	Not Applicable / De Minimis Effect: • If facility is located on a Water Quality Limited river reach, provide a link to the state's most recent impaired waters list and indicate the page(s) therein that apply to facility waters. If possible, provide an agency letter stating that the facility is not a cause of such limitation. • Explain the rationale for why the facility does not alter water quality characteristics below, around, and above the facility.

There are no impaired waters on the Suncook River which apply to the facility's waters. Upstream of the facility there are segments of the Suncook River in Epsom, Barnstead, Gilmanton, and Alton, NH which have an NHDES rating of 5-M (considered "Poor") and require a TMDL. There are 4 distinct segments, and all segments are under 2 miles in length.[20]

According to NHDES, the Lower Suncook River, specifically in the area of the Webster Mill and Pembroke Dam, is designated as Category 2-G for Drinking Water After Adequate Treatment, and 4A-M for Fish Consumption, due to high levels of mercury.[21] There is insufficient data for Recreation, Aquatic Life, Wildlife, and Boating.

As noted above, the Project received an exemption from licensing on February 24, 1983 (FERC issued an Order Granting Exemption from Licensing for a Small Hydroelectric Project of 5 MW or Less (to the Pembroke Hydro Corporation) and Denying Major License Application (to the Suncook Hydro Corporation) (Exemption Order)).

- A FERC eLibrary review was conducted to search for all relevant FERC documents, including the 401 Water Quality Certification. The search results noted that FERC did not require a 401 Water Quality Certification before acting on the exemption application. The Federal Power Act subjects FERC exempt projects only to the terms and conditions attached to the exemption 16 U.S.C § 823a(c). Nevertheless, certain states may still require a 401 Water Quality Certification for FERC exempted projects as a term or condition to the exemption.[22]

- No Water Quality Certificate was issued according to the applicant and the FERC record.

[20] https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2018/index.htm
[21] https://www.des.nh.gov/organization/divisions/water/wmb/rivers/documents/suncook-305b-303d-listings.pdf (Pages 11 and 12)
[22] If the state requires a certification, typically the developer or licensee would have requested a water certification early on in the FERC exemption process per 16 U.S.C § 823a(c)

In 2015 Essex Hydro conducted water quality sampling on behalf of the Exemptee based on a sampling plan developed in cooperation with the NHDES, however due to failure of equipment during deployment, the NHDES required that Water Quality Sampling be retested in 2016. In 2016, Essex Hydro completed water quality sampling in the summer and drafted a report for submittal to NHDES. Prior to submitting the report, the results of the monitoring were forwarded to LIHI by Essex Hydro on April 27, 2017 (Appendix B). The monitoring had occurred during the severe drought conditions and heat of that summer. The results from the monitoring for DO and %DO saturation in the impoundment did not meet NHDES water quality standards for a portion of the monitoring period. In January 2017, Essex Hydro consulted with NHDES to discuss the results. As a follow up to this conversation, the Exemptee contacted NHDES to discuss operational issues that occurred during the sampling period, noting the potential impact on the sampling results, and requested the opportunity to resample. The Exemptee speculated that the operational issues with the Obermeyer gate, which resulted in the lowering of the impoundment to the top of the dam during the monitoring period, in conjunction with the drought conditions may have affected the DO levels and %DO saturation.

NHDES allowed the Exemptee to perform the water quality testing, and in the summer of 2017, the Exemptee monitored water quality at the Project. Results were provided to LIHI on October 31, 2017.

On March 22, 2018, Ted Walsh (NHDES) sent a letter to LIHI confirming the water quality status of the Suncook River in the vicinity of the Webster-Pembroke Project. For the purposes of LIHI certification, NHDES was asked to confirm if the project was contributing to violations of state water quality standards. At the time, NHDES confirmed that the water quality data collected, and information provided to NHDES confirmed that the Webster-Pembroke Project was in compliance with state water quality standards (Appendix B). Water Quality data and results can be provided to LIHI upon request.

3.3 UPSTREAM FISH PASSAGE STANDARDS

3.3.1 IMPOUNDMENT

CRITERION	STANDARD	INSTRUCTIONS
C	1	Not Applicable / De Minimis Effect: • Explain why the facility does not impose a barrier to upstream fish passage in the designated zone. Typically, impoundment zones will qualify for this standard since once above a dam and in an impoundment, there is no facility barrier to further upstream movement. • Document available fish distribution data and the lack of migratory fish species in the vicinity. • If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.

On February 24, 1983, the Commission issued an Order Granting Exemption from Licensing to the Webster Pembroke project. Standard Article 2 of the Exemption Order requires compliance with any terms and conditions that Federal or State fish and wildlife agencies have determined appropriate to prevent loss of, or damage to, fish and wildlife resources.

Eagle Creek's August 14, 2014 voluntary MOA with USFWS established a plan and schedule for addressing fish passage (for River herring and American Eel) and minimum flow issues at certain hydroelectric projects in New Hampshire. No upstream passage has been required at the Project to date. In addition, there is no upstream fish passage at the privately-owned China Mill Dam, the next dam downstream of the Webster Pembroke Project, and the last dam before the Suncook River's confluence with the Merrimack River. The next dam upstream of the Project is approximately 20 river miles upstream, the FERC Exempt Pittsfield Mill Dam, which is owned by the New Hampshire Department of Environmental Services. There is no downstream passage at the decommissioned Pittsfield dam. The FERC eLibrary does not provide any historical documentation, and the Environmental Assessment did not capture information on downstream passage.

The Webster Pembroke Project is in compliance with the requirements of the MOA and the Exemptee has not been asked by any agency to install upstream passage facilities at the site to date. Upstream passage will be reviewed in 2020 per the terms of the MOA and the 2019 interim extension of the MOA.

Migratory species historically present in the Suncook River include, alewife, American Shad, blueback herring, Atlantic salmon, and American eel. There are no formal, final restoration plans or management plans for river herring or American eel in the Suncook River. According to the

Strategic Plan & Status Review, Anadromous Fish Restoration Plan, Merrimack River[23] (Technical Committee for Anadromous Fishery Management of the Merrimack River Basin and Advisors to the Technical Committee, October 16, 1997), anadromous fish were well distributed in the upper Merrimack River basin historically. The Pemigewasset River basin (north of the Merrimack) served as the principal source of salmon production, while shad and river herring (alewives and blueback herring) more likely utilized the Merrimack River mainstem and other Merrimack tributaries. In 1847, the Essex Dam in Lawrence, Massachusetts was constructed at River Mile 30 (approximately 40 miles south of the Project), blocking anadromous fish runs to critical upstream habitat. Atlantic salmon became extirpated, while shad and river herring maintained diminished populations by using available habitat downstream of Essex Dam. Atlantic salmon occurred historically in the Merrimack River watershed; however, the USFWS terminated Atlantic salmon restoration efforts for the Merrimack River in 2013 due to a lack of funds and a change in management direction.

According to the updated 2015 New Hampshire Wildlife Action Plan (Action Plan)[24], "the ultimate success of river herring restoration programs in the New Hampshire portion of the Merrimack River watershed will depend on improvements in fish passage, which will allow river herring to reach as much suitable spawning habitat as possible. Currently, very few blueback herring have been documented passing upstream of the Essex Dam in Lawrence despite anecdotal observations of blueback herring below the dam. If blueback herring were able to pass upstream of the two dams in Massachusetts, they would have access to over 50 river km of potential spawning habitat in New Hampshire. This does not include potential habitat in the tributaries. There is tremendous potential for blueback herring restoration in the Merrimack River watershed, but this potential cannot be reached until fisheries managers can identify the cause (or causes) of poor blueback herring passage at the Essex Dam."

In addition, the Action Plan addresses American Eel. The Action Plan states that "there is a significant drop in eel abundance upstream of the first major dams on the Merrimack and Connecticut Rivers (Sprankle 2002). Catch rates from the upper Merrimack River, in New Hampshire, were the lowest of all sites surveyed in the study."

The Project is in Compliance with all resource agency recommendations regarding upstream fish passage at the Project.

[23] https://www3.epa.gov/region1/npdes/merrimackstation/pdfs/ar/AR-1252.pdf
[24] https://www.wildlife.state.nh.us/wildlife/wap.html

3.3.2 UPSTREAM FISH PASSAGE STANDARDS

3.3.2.1 BYPASS REACH AND TAILRACE

CRITERION	STANDARD	INSTRUCTIONS
C	2	Agency Recommendation: • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. • Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

Article 2 of the Webster Pembroke Project's FERC Exemption from Licensing dated February 24, 1983 requires compliance with any terms and conditions that Federal or State fish and wildlife agencies have determined appropriate to prevent loss of, or damage to, fish and wildlife resources.

No upstream passage has been required at the Project to date. In addition, there is no upstream fish passage at the privately-owned China Mill Dam, the next dam downstream of the Webster Pembroke Project, and the last dam before the Suncook River's confluence with the Merrimack River. The next dam upstream of the Project is approximately 20 river miles upstream, the FERC Exempt Pittsfield Mill Dam, which is owned by the New Hampshire Department of Environmental Services.

Eagle Creek's August 14, 2014 voluntary MOA with USFWS established a plan and schedule for addressing fish passage (for River herring and American Eel) and minimum flow issues. The Webster Pembroke Project is in compliance with the requirements of the MOA and Eagle Creek has not been asked by any agency to install upstream passage facilities at the site. Upstream passage will be reviewed in 2020 per the terms of the MOA and the interim extension of the MOA.

Further discussions on upstream and downstream passage for River herring and American eel at the site are ongoing as the Parties work towards developing an extension to the MOA.

As noted above, and in accordance with the MOA, American eel passage has not yet been mandated though can be planned for/implemented if passage measures are needed based on notification by NHFGD and/or USFWS. Eagle Creek and USFWS have begun discussions to extend the MOA with USFWS recommending implementation of upstream and downstream eel

passage protection measures (including relevant language committing to implementation of eel passage and protection at the Webster-Pembroke Project in the new MOA), and further noting that River herring passage is not needed at this time but should be revisited in five years or after the MOA has expired. Consultations regarding the extension of the MOA are ongoing, and Eagle Creek's commitment to future upstream/downstream fish and eel passage as part of a basin wide management plan will be further discussed in upcoming meetings.

The Project is in Compliance with all resource agency recommendations regarding upstream fish passage at the Project.

3.4 DOWNSTREAM FISH PASSAGE AND PROTECTION STANDARDS

3.4.1 ALL ZOES

CRITERION	STANDARD	INSTRUCTIONS
D	2	Agency Recommendation: • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. • Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

Article 2 of the Webster Pembroke Project's FERC Exemption from Licensing dated February 24, 1983 requires compliance with any terms and conditions that Federal or State fish and wildlife agencies have determined appropriate to prevent loss of, or damage to, fish and wildlife resources.

Eagle Creek's August 14, 2014 voluntary MOA with USFWS established a plan and schedule for addressing fish passage (for River herring and American Eel) and minimum flow at certain New Hampshire sites. In 2016, the Webster Pembroke Project, based on consultation and agreement with USFWS, installed interim downstream fish passage measures which consisted of rebuilding a pool and discharge/diversion chute on the downstream side of the waste gate stop log sections near the unit intake (located at the downstream end of the canal) similar to that used in years past to accommodate downstream passage for River herring. These facilities were destroyed at the end of the season due to high flows and debris. In 2017, the USFWS/NHFG did not stock herring in the Suncook River and instead of replacing the pool/channel, USFWS personnel preferred that a temporary eel collection box be installed under their direction. The Exemptee coordinated with the USFWS for the installation and monitoring of the eel collection box. No eels were collected. In 2018, the Suncook River was stocked with excess herring. The Exemptee repaired the pool and diversion chute and the facilities were operational for the downstream fish passage season. These facilities were temporary structures, constructed of wood, and were destroyed during high flow and debris at the end of the fish passage season. In 2019 there were no herring stocked in the Suncook River, so the downstream fish passage facilities were not reconstructed. The Exemptee continues to coordinate with NHFG, who runs the stocking program.

The Exemptee has worked cooperatively with both NHFG and USFWS for downstream fish passage at the site during the certification period. Although no formal plans have been required

by the agencies under the MOA, the Exemptee has continued to coordinate with resource agencies for downstream passage during the years when River herring are stocked in the Suncook River. Further discussions on upstream and downstream passage for River herring and American eel at the site are ongoing as the Parties work towards developing an extension to the MOA.

Each year, prior to the downstream passage season, the Exemptee and resource agency field personnel have meet to discuss measures that the resource agencies would like to try at the site. In 2016, the Exemptee and USFWS field personnel coordinated on a design and similar to arrangements used in previous years to accommodate downstream herring passage when the Suncook River watershed was stocked by NHFG with surplus herring, the Exemptee installed boards across the channel outlet under the bridge to create a plunge pool and discharge chute on the downstream side of the wastegate located adjacent to the trash racks at end of the canal. These facilities were destroyed by high flows and debris passage operations at the site. In 2017, NHFG did not stock River herring in the watershed, and the USFWS requested that rather than installing downstream passage measures, the USFWS and Eagle Creek worked cooperatively to try out a temporary eel capture device.

The updated Appendix A of the MOA, dated February 2017 and approved by USFWS in August 2017, noted that in 2017 the trash gate, intake velocities and trash racks would be evaluated for permanent passage measures for herring. However, based on consultation with the USFWS just prior to the downstream passage season, since no restoration plan was developed and in effect at that time, and no stocking was planned for the 2017 season, the Parties verbally agreed to defer the review of the trash gate, intake velocities and trashracks until a mutually agreed upon time in the future.

In 2018 the Suncook River was stocked with excess River herring. The Exemptee coordinated with NHFG and repaired the temporary fish passage chute and installed boards across the channel outlet under the bridge to create a plunge pool. The downstream fishway was destroyed during high flow and debris passage operations at the site. In 2019 there were no herring stocked in the Suncook, so no fish passage was constructed. There were also no efforts by either USFWS or NHFG for eel capture in 2018 or 2019.

As noted above, and in accordance with the MOA, American eel passage has not yet been mandated though can be planned for/implemented if passage measures are needed based on notification by NHFGD and/or USFWS. Eagle Creek and USFWS have begun discussions to extend the MOA with USFWS recommending implementation of upstream and downstream eel passage protection measures (including relevant language committing to implementation of eel passage and protection at the Webster-Pembroke Project in the new MOA), and further noting that River herring passage is not needed at this time but should be revisited in five years or after the MOA has expired. Consultations regarding the extension of the MOA are ongoing, and Eagle Creek's commitment to future upstream/downstream fish and eel passage as part of a basin wide management plan will be further discussed in upcoming discussions.

Migratory species historically present in the Suncook River include, alewife, American Shad, blueback herring, Atlantic salmon, and American eel. There are no formal, final restoration plans or management plans for river herring or American eel in the Suncook River. Atlantic salmon occurred historically in the Merrimack River watershed; however, the USFWS terminated

Atlantic salmon restoration efforts for the Merrimack River in 2013 due to a lack of funds and a change in management direction.

The Project is in Compliance with all resource agency recommendations regarding downstream fish passage at the Project.

3.5 SHORELINE AND WATERSHED PROTECTION STANDARDS

3.5.1 ALL ZOES

CRITERION	STANDARD	INSTRUCTIONS
E	1	Not Applicable / De Minimis Effect: • If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the project boundary). • Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.

As noted above, the Project received an exemption from licensing on February 24, 1983 (FERC issued an Order Granting Exemption from Licensing for a Small Hydroelectric Project of 5 MW or Less (to the Pembroke Hydro Corporation) and Denying Major License Application (to the Suncook Hydro Corporation) (Exemption Order)).The Project has not been subject to any shoreline requirements per the license exemption. Furthermore, no Shoreline Management Plan exists for the Project.

Most of the land surrounding the project area consists of medium to heavy urban development. Roads run parallel to the Suncook River on both sides within the extent of the Project area. Much of the land which abuts the Suncook River in the area around the Pembroke and Webster Dams consists of business and residential development (See Figure 3-1). In addition to urban development, portions of the riverbank were rip-rapped in the past. Upstream from the Project area, agricultural areas are found along the Suncook in the town of Pembroke; however, they are generally out of the range of the Project footprint.[25] An Information for Planning and Consultation (IPaC) report of the facility area was generated on February 21, 2020 (Appendix E). The report confirmed that there were no adjacent wetlands outside of the ordinary high-water line.

Annual drawdowns impact several lakes on the Suncook River. In 2018[26] and 2019[27], four lakes controlled by dams on the Suncook River experienced drawdowns. The lakes include Crystal Lake, Upper Suncook Lake, Lower Suncook Lake, and Sunset Lake. The Project's reservoir is not affected by the NHDES's annual drawdown program.

A Fluvial Geomorphology Assessment was conducted on much of the Suncook River starting from its confluence with the Merrimack River up to approximately its confluence with Sanders Brook. The assessment found that the short stretch from the China Mill Dam to the Merrimack River is rated as a B3 stream according to the Rosgen classification system.[28] A B3 rating

[25] https://www.pembroke-nh.com/sites/pembrokenh/files/uploads/mp_chapter_11_land_use.pdf
[26] https://www.des.nh.gov/media/pr/2018/20180917-lakes-drawdown.htm
[27] https://www.des.nh.gov/media/pr/2019/20190910-lakes-drawdown.htm
[28] The Rosgen Classification of Natural Rivers & Natural Channel Design assigns a channel type based on channel slope, width to depth ratio, bed material, entrenchment ratio and sinuosity.

implies that the river section is mainly composed of cobble. Additionally, the river contains riffles and often rapids. The geomorphic condition of the reach caused it to be assigned a condition rating of "fair," which translates to a reach with "high sensitivity." Sensitivity can be defined as the potential of a river to respond to flood events through bank erosion and lateral migration (across the floodplain) processes. Sensitivity ranges from very low, low, moderate, high, very high, and extreme. Therefore, high sensitivity suggests that there is a potential for flooding within this reach. This "high sensitivity" area is located immediately downstream of the Project. The stretch from Pembroke dam to Webster dam is also classified as a B3 stream. The geomorphic condition was "poor" and is also considered "high sensitivity."[29]

Although the area around the Pembroke and Webster Dams does not contain any significant ecological features, a portion of the river about 8 miles upstream near Epsom was the site of an avulsion, wherein a new river channel was created in 2006 following a 100-year flood event (this event was considered very rare for New England).[30] Project planning is underway in Allenstown to stabilize the bank in the avulsion area.[31] Although the avulsion occurred several miles from the Project site, the conditions of the stream bank at the Project area suggest that it is much less likely that an avulsion will occur in the Project area. The stream banks of the avulsion site were not steep, composed mainly of sand, and were given a stream sensitivity rating of "extreme". Conversely, the banks of the river near the project site are extremely steep (>25% slope), composed of boulders and bank revetment, and had a stream sensitivity rating of "high."

[29] https://www.allenstownnh.gov/sites/allenstownnh/files/file/file/fluvial_erosion_hazard_study_050715.pdf
[30] https://www.des.nh.gov/organization/divisions/water/wmb/rivers/suncook-river.htm
[31] https://www.concordmonitor.com/suncoock-river-flood-erosion-fix-13028572

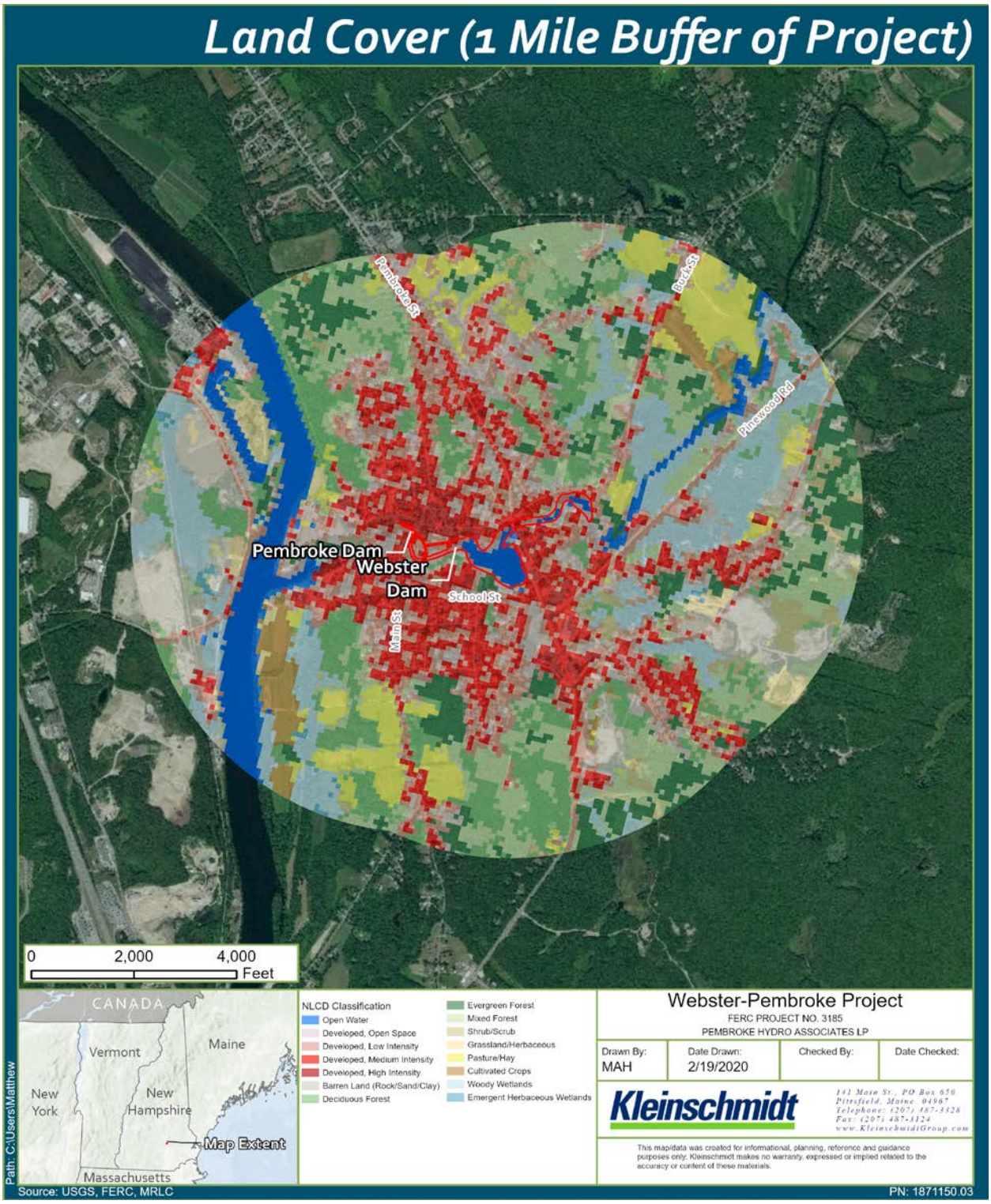

FIGURE 3-1 LAND COVER TYPES WITHIN 1/2-MILE BOUNDARY OF WEBSTER-PEMBROKE PROJECT

3.6 THREATENED AND ENDANGERED SPECIES STANDARDS

3.6.1 ALL ZOES

CRITERION	STANDARD	INSTRUCTIONS
F	1	<u>Finding of No Negative Effects:</u> • Identify all federal and state listed species in the facility area based on current data from the appropriate state and federal natural resource management agencies. • Provide documentation that there is no demonstrable negative effect of the facility on any listed species in the area from an appropriate natural resource management agency or provide documentation that habitat for the species does not exist within the ZOE or is not impacted by facility operations.

On August 14, 2014, Eagle Creek entered into a Memorandum of Agreement (MOA) (Appendix D) with the USFWS to establish a plan and schedule for addressing fish passage and minimum flow issues. In this MOA, the USFWS acknowledged that there are no Federally listed or proposed endangered or threatened species under the USFWS's jurisdiction that are known to exist in the Project's impact area. In addition, no habitat in the Project's impacts area is currently designated or proposed "critical habitat" in accordance with the Endangered Species Act. An interim extension of the MOA has been executed by both parties extending the term of the current MOA through March 31, 2020 (Appendix D).

On February 21, 2020, an Information for Planning and Consultation (IPaC) report was generated from the USFWS online project planning tool to confirm threatened and endangered species in the Project facility area (see Appendix E). Two species may potentially have habitat in the Project facility area:

- The Northern Long-eared Bat (*Myotis septentrionalis)*, which is listed as Threatened. The northern long-eared bat (NLEB) was listed as a federally threatened species under the ESA on May 4, 2015 and is also a species of special concern in New Hampshire.
    - The facility abides by the 4(d) Ruling for the NLEB.
- The Small Whorled Pogonia (*Istoria medeoloides*), which is listed as Threatened. The largest known population of this species is found in Central NH and Maine.

The IPaC report also listed three (3) migratory birds protected under the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. The birds listed below are birds of particular concern because they are either a Bird of Conservation Concern or may warrant special protections in the project area.

- Bald Eagle (*Haliaeetus leucocephalus*)
- Bobolink (*Dolichonyx orzyivorous*)
- Prairie Warbler (*Dendroica discolor*)

The Natural Heritage Bureau (NHB) database identified 3 protected wildlife species in the vicinity of the project:

- Bald eagle (*Haliaeetus leucocephalus*) Special concern (State)
- Blanding's Turtle (*Emydoidea blandingii*)- Endangered (State)
- Brook floater (*Alasmidonta varicosa*) Endangered (State)

Although these species of migratory birds may be present in the Project vicinity, there are no provisions or management plans required of the Exemptee with regard to species protection. The Project complies with all provisions under the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act.

According to the 2015 New Hampshire Fish and Game Department Wildlife Action Plan, the State of New Hampshire lists two species as endangered or a Species of Special Concern:

- The brook floater mussel (*Alasmidonta varicosa*) is a listed endangered species in New Hampshire that was historically found in the Suncook. Since the brook floater mussel prefer flowing water, areas around impacted dams are not generally considered suitable habitat.[32]
- Wood Turtle (*Glyptemys insculpta*) is a State Species of Special Concern. Wood turtles are associated with rivers and streams with hard sand or gravel substrate, but make extensive use of surrounding uplands during the summer.[33]

The New Hampshire Natural Heritage Bureau provides a list of all rare species within each town in New Hampshire. Given that Allenstown is almost entirely within the Suncook watershed, it is likely that the listed species in Allenstown can be also be found within the river's watershed. The species include:

SPECIES	FEDERALLY LISTED	STATE LISTED
Plants		
Dry land sedge (*Carex siccata*)		Endangered
Licorice goldenrod (*Solidago odora ssp. odora*)		Threatened
Small whorled pogonia (*Isotria medeoloides*)	Threatened	Threatened
Vertebrates- Bird		
Bald eagle (*Haliaeetus leucocephalus*)**	Special Concern	
Vertebrates- Reptiles		
Blanding's turtle (*Emydoidea blandingii*)***		Endangered
Northern black racer (*Coluber constrictor constrictor*)**		Threatened
Spotted turtle (*Clemmys guttata*)*		Threatened
Vertebrates- Fish		
Swamp darter (*Etheostoma fusiforme*)**		Special Concern

***Extremely high importance; ** Very high importance; * High importance

[32] https://www.wildlife.state.nh.us/wildlife/profiles/brook-floater-mussel.html0
[33] https://www.wildlife.state.nh.us/wildlife/profiles/wap/reptile-woodturtle.pdf

On February 14, 2020, a New Hampshire Natural Heritage Bureau data request was submitted. (NHB20-0481). The proof of submittal is attached in Appendix E. The report will be forwarded to LIHI upon receipt.

3.7 CULTURAL AND HISTORIC RESOURCES STANDARDS

3.7.1 ALL ZOES

CRITERION	STANDARD	INSTRUCTIONS
G	2	Approved Plan: • Provide documentation of all approved state, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility. • Document that the facility is in compliance with all such plans.

During the relicensing process, no known sites of historic or archeological importance were discovered in the Webster-Pembroke Project area. FERC did not require the Exemptee to develop a cultural resource management plan unless a future activity trigged consultation with the New Hampshire State Historic Preservation Officer (SHPO).

On February 27, 2019, Pembroke Hydro LP submitted a proposal to FERC for a partial removal of the Pembroke Dam. The Pembroke Dam is a stone masonry dam and is located downstream of the Webster Dam. It receives minimum flow and spillway releases from the Webster Dam. Although part of the Project, the Pembroke Dam is not a primary water retaining structure and is not required for continued hydroelectric project operations. A low-level waste gate located at the base of the Pembroke Dam was previously removed and remains open at all times. The Webster Dam's minimum flow release passes through this opening, and the Pembroke Dam does not impound water during normal conditions. During high-flow conditions, the flow in the bypass reach can exceed the capacity of the low-level opening and impounded water will rise to spill over the crest of the Pembroke Dam. High-flow conditions in the last decade have caused overtopping of the Pembroke Dam's right abutment (a stone masonry and concrete training wall located along the right bank) (Photo 5-8). Both FERC and the New Hampshire Dam Bureau recommended a partial removal of this dam.

On May 9, 2019, FERC issued a Notice of Application Accepted for Filing, Soliciting Comments, Motions to Intervene, and Protests for the dam removal.[34] This partial dam removal triggered consultation with the New Hampshire SHPO, which resulted in a Memorandum of Agreement[35], as the Pembroke Dam was determined to be a contributing feature of the Pembroke Mill, which is listed on the National Register of Historic Places under Section 106 of the National Historic Preservation Act (see more information in Section 3.1).

On October 23, 2019,[36] Eagle Creek entered into a MOA with FERC and the New Hampshire State Historic Preservation Officer (SHPO) to establish a plan for addressing the partial removal of the Pembroke Dam (Appendix F).

[34] https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=15242072
[35] https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=15303969
[36] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15364368

- FERC, in consultation with the New Hampshire SHPO, determined that the partial dam removal's adverse effects could not be avoided. Removing the dam stones is necessary to ensure high flows no longer overtop Pembroke Dam and to ensure renters occupying the bottom level of the building located adjacent to the Pembroke Dam's right abutment are not flooded.

- Further, the implementation of requirements set forth in the MOA will mitigate the adverse effects from the removal of the historic property. The MOA states that the Commission would ensure the proposed mitigation measures are carried out by the Exemptee and in consultation with the NHDHR. These measures include preparation of photographic (digital) documentation of the dam and its setting prior to and during project implementation, development and installation of interpretative signage in the vicinity of Pembroke Mill, and design and installation of historic banners that would be placed along the bridge over Pembroke Dam.

- Pembroke Hydro LP is still waiting on FERC's amendment for the partial dam removal.

- The removal is scheduled to take place in 2020 at which time the mitigation measures will be met. The Exemptee has three years to complete the mitigation measures (expiration date on October 23, 2022).

- The Exemptee has met (or will meet) all required permits necessary to complete the partial dam removal, as required by local, state, and federal agencies.

    - State of New Hampshire Department of Environmental Services, Wetlands and Non-Site-Specific Permit. Approved March 29, 2019 (Expiration date March 29, 2024).

    - Army Corps of New Hampshire State Programmatic General Permit – Minor impact NH Wetlands Permit.

    - Allentown and Pembroke towns have both been made aware of the project and have stated that the town does not have specific permits or obligations.

    - State of New Hampshire Department of Environmental Services, NH Natural Heritage Bureau Review completed June 2018.

    - USFWS IPaC review

The Project is in Compliance with all resource agency recommendations regarding cultural and historic resources standards. On May 24, 2018, Kleinschmidt Associates, on behalf of Pembroke Hydro LP, submitted a Request for Project Review to the New Hampshire Division of Historical Resources (NHDHR). NHDNR asked for additional information on June 18, 2018. Gray & Pape completed an Individual Inventory Form with photo documentation in October 2018. In November 2018, the structure was found to be eligible. The Historic American Engineering Record (HAER) document was completed for the before construction in July 2019. The second part of the HAER documentation is to be completed during the partial removal, at which point the photo documentation will be sent to the SHPO.

Per the MOA the Exemptee will fund the completion of design, fabrication, and installation of an interpretive sign to be located in the vicinity of the Pembroke Mill. Location of the sign will be in consultation with the New Hampshire SHPO (NHDHR) and local municipalities. Design will be overseen by an Architectural Historian qualified under 36 CFR 61. The interpretive signage will provide information on the Pembroke Dam and its association with the Pembroke Mill and milling context in the region.

An opportunity for review will be provided to the Allenstown Historical Society, Pembroke Historical Society, and the New Hampshire SHPO (NHDHR), each of which will have 30 days to comment. Upon approval of the design and content, the Exemptee will ensure that the interpretive sign is fabricated and installed in accordance with the approved design.

Additionally, the Exemptee will fund the design and installation of no more than 6 banners to be placed along the bridge over the Pembroke Dam. The banners will convey the milling history of the area. Design will be developed by a professional graphic designer in consultation with an Architectural Historian who is qualified under the Secretary of the Interior's Historic Preservation Professional Standards. An opportunity for review will be provided to the Allenstown Historical Society, Pembroke Historical Society, and New Hampshire, each of which will have 30 days to comment.

3.8 RECREATIONAL RESOURCES STANDARDS

3.8.1 ALL ZOES

CRITERION	STANDARD	INSTRUCTIONS
H	3	Assured Accessibility: • In lieu of existing recommendations and plans for recreational uses, document the facility's current and future commitment to accommodate reasonable requests from recreation interests for adequate public access for recreational use of lands and waters of the facility, including appropriate recreational water flows and levels, without fees or charges.

Recreational facilities were not included as a requirement in the Project's FERC exemption issued February 4, 1983. The Exemptee is not required to maintain recreation sites in the project area, nor does the Project have a Recreation Resources Management Plan. In lieu of an existing recreation management plan, the Exemptee is committed to accommodating reasonable access from recreationists for use of the project lands and waters of the facility without fees or charges. The Exemptee allows recreational access free of charge within a safe distance of the project works.

The Suncook River does not offer many recreational opportunities within the Project area. Within the Project area itself, fishing seems to be the primary form of recreation. The Suncook River is stocked with trout for fishing between the Route 126 bridge (Barnstead) and the confluence of the Suncook and Merrimack Rivers.[37]

Kayaking (not whitewater) is popular on the Suncook, but there is never any mention of kayaking occurring within the vicinity of the Project area (most kayaking seems to occur several miles upstream).[38] [39] On the north bank of the river close to the China Mill Dam, there is a multi-use public park which offers several recreational facilities, including a basketball court, four ball fields (one lighted) for baseball and softball, a soccer field, a beach volleyball court, a fitness course, a horseshoe pits, a playground, various picnic areas, a pavilion, a gazebo, and a boat launch area. All facilities are maintained by the NHDES's summer employees and by volunteers from the community. There is a campground (Twin Oaks Campground) approximately one mile upstream from the Project area.

The most significant organization dedicated to recreation on the Suncook River is the "Friends of the Suncook River" organization. Their mission is to "maintain a healthy Suncook River watershed by educating and engaging citizens in its history, recreation, and protection." According to their website, kayaking (and perhaps other forms of recreation) occur within the

[37] https://wildlife.state.nh.us/fishing/trout-streams.html
[38] http://bostonkayaker.com/cgi-bin/bkonekpage.cgi?pagekey=suncookfbarnstead
[39] http://bostonkayaker.com/cgi-bin/bkonekpage.cgi?pagekey=suncookpepsom

Suncook, but the site does not specify if such activity occurs within the area of the Pembroke and Webster Dams.[40]

[40] http://www.mysuncookriver.org/

4.0 FACILITY CONTACTS FORM

1. All applications for LIHI Certification must include complete contact information to be reviewed.

Project Owner:	
Name and Title	Robert Gates, Vice President
Company	Pembroke Hydroelectric Associates, LP
Phone	973-998-8403
Email Address	Bob.Gates@eaglecreekre.com
Mailing Address	65 Madison Avenue, Suite 500, Morristown, NJ 07960
Consulting Firm / Agent for LIHI Program (if different from above):	
Name and Title	Nuria Holmes & Fatima Oswald
Company	Kleinschmidt Associates
Phone	971-266-5395
Email Address	Nuria.Holmes@KleinschmidtGroup.com Fatima.Oswald@KleinschmidtGroup.com
Mailing Address	1500 NE Irving Street, Suite 550, Portland, OR 97232
Compliance Contact (responsible for LIHI Program requirements):	
Name and Title	Robert Gates, Vice President
Company	Pembroke Hydroelectric Associates, LP
Phone	973-998-8403
Email Address	Bob.Gates@eaglecreekre.com
Mailing Address	65 Madison Avenue, Suite 500, Morristown, NJ 07960
Party responsible for accounts payable:	
Name and Title	Robert Gates, Vice President
Company	Pembroke Hydroelectric Associates, LP
Phone	973-998-8403
Email Address	Bob.Gates@eaglecreekre.com
Mailing Address	65 Madison Avenue, Suite 500, Morristown, NJ 07960

2. Applicant must identify the most current and relevant state, federal, provincial, and tribal resource agency contacts (copy and repeat the following table as needed).

Agency Contact (Check area of responsibility: Flows **X**_, Water Quality __, Fish/Wildlife Resources _**X**_, Watersheds _**X**_, T/E Spp. __, Cultural/Historic Resources __, Recreation _ _):	
Agency Name	United States Fish and Wildlife Service (USFWS)
Name and Title	Julianne Rosset; Fish & Wildlife Biologist
Phone	603-227-6436
Email address	julianne_rosset@fws.gov
Mailing Address	USFWS New England Field Office 70 Commercial Street, Suite 300 Concord, NH 03301
Agency Contact (Check area of responsibility: Flows_**X**_, Water Quality _**X**_, Fish/Wildlife Resources __, Watersheds _X_, T/E Spp. __, Cultural/Historic Resources __, Recreation _ _):	

Agency Name	New Hampshire Department of Environmental Services (NHDES)
Name and Title	Gregg Comstock, P.E.; Supervisor, Water Quality Planning Section
Phone	603-271-2983
Email address	gregg.comstock@des.nh.gov
Mailing Address	NH Department of Environmental Services 29 Hazen Drive, P.O. Box 95 Concord, NH 03302-0095
Agency Contact (Check area of responsibility: Flows X_, Water Quality _X_, Fish/Wildlife Resources X__, Watersheds __, T/E Spp. _X_, Cultural/Historic Resources _ _, Recreation _X_):	
Agency Name	New Hampshire Fish and Game Department (NHFGD)
Name and Title	Carol Henderson; Environmental Review Coordinator
Phone	603-271-1138
Email address	Carol.Henderson@wildlife.nh.gov
Mailing Address	New Hampshire Fish and Game Department 11 Hazen Drive Concord, NH 03301
Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources _ _, Watersheds __, T/E Spp. _ _, Cultural/Historic Resources _X_, Recreation __):	
Agency Name	New Hampshire Division of Historical Resources
Name and Title	Nadine Miller; Deputy State Historic Preservation Officer
Phone	603-271-6628
Email address	Nadine.Miller@dncr.nh.gov
Mailing Address	NH Division of Historical Resources 19 Pillsbury Street – 2nd Floor Concord, NH 03301-3570

5.0 SWORN STATEMENT

As an Authorized Representative of Pembroke Hydro Associates LP, the Undersigned attests that the material presented in the application is true and complete.

The Undersigned acknowledges that the primary goal of the Low Impact Hydropower Institute's Certification Program is public benefit, and that the LIHI Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The Undersigned further acknowledges that is certification of the applying facility is issues, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified.

The Undersigned Applicant further agrees to hold the Low Impact Hydropower Institute, the Governing Board, and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's Certification Program.

Signature

Robert Gates
Name

Vice President
Title

Pembroke Hydro Associates LP
Company

APPENDIX A

PROJECT PHOTOGRAPHS

PHOTO 5-1 WEBSTER DAM

PHOTO 5-2 SLUICE GATE OPERATOR ON RIGHT ABUTMENT

PHOTO 5-3 VIEW OF RIGHT SPILLWAY ABUTMENT AND SLUICE GATE OUTLET

PHOTO 5-4 VIEW OF CANAL GATEHOUSE LOOKING DOWNSTREAM

PHOTO 5-5 VIEW OF CANAL LOOKING DOWNSTREAM

PHOTO 5-6 VIEW OF CANAL AT PENSTOCK INTAKE

PHOTO 5-7 LEFT SPILLWAY ABUTMENT OF PEMBROKE DAM

PHOTO 5-8 PEMBROKE DAM WALL LOOKING DOWNSTREAM

PHOTO 5-9 POWERHOUSE INTERIOR AND POWER GENERATING UNIT

PHOTO 5-10 VIEW OF BOAT BARRIER ON IMPOUNDMENT

PHOTO 5-11 SUNCOOK RIVER UPSTREAM OF PEMBROKE DAM

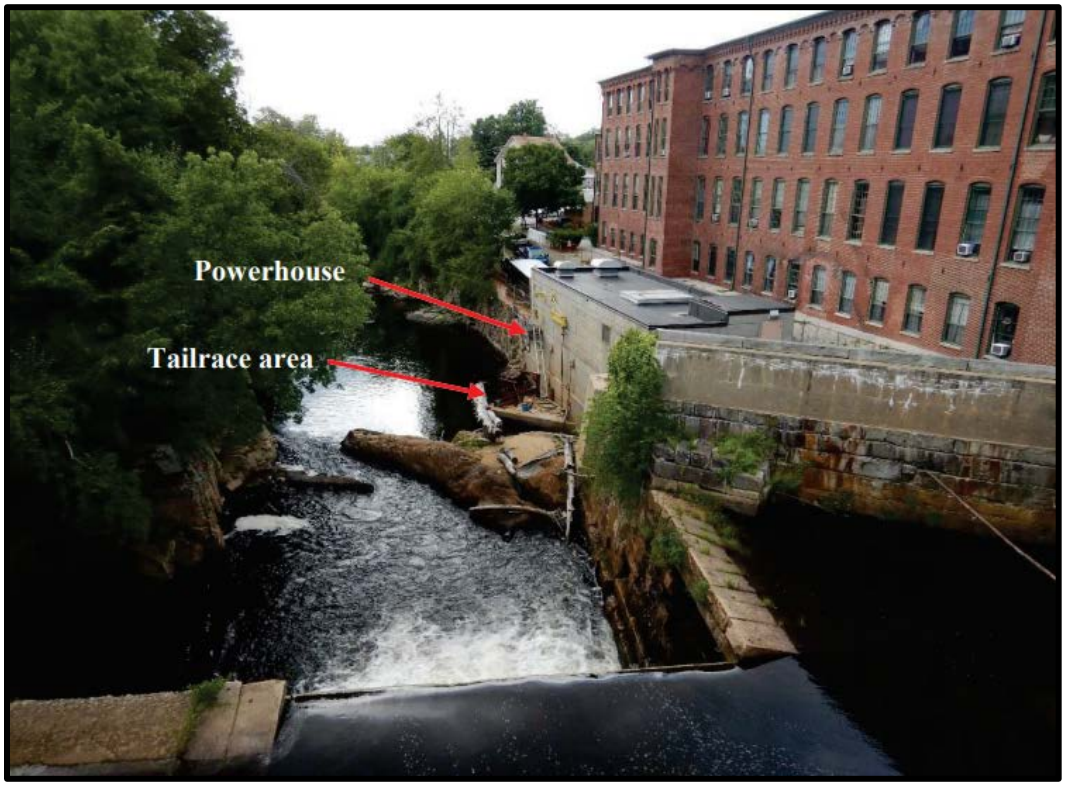

PHOTO 5-12 VIEW OF DOWNSTREAM BELOW PEMBROKE DAM

APPENDIX B

AGENCY CONSULTATION

Request for NHB Review of "Potential Impacts" from the NHB DataCheck Tool

NHB File Number: NHB20-0481
Data Requested: 2/14/2020

Requested By:

Name: Nuria Holmes
1500 NE Irving Street, Suite 550
Portland, OR 97232
E-mail: nuria.holmes@kleinschmidtgroup.com
Phone: 971-266-5395

Project Location:

Town: Pemrboke and Allenstown
Description: Webster Dam and Pembroke Dam hydro facilities from tailrace of dams upstream to dam impoundment.

Payment Information. These fields MUST be filled out.

Check Number: 23225

Name of Account: Kleinschmidt Associates

(as printed on the check)

Enclose this completed form with a check in the amount of $25, made out to "Treasurer, State of NH".

Send the check and the completed form to the following address:

DRED - NHB
NHB Reviews
172 Pembroke Road
Concord, NH 03301

From:	Carpenter, Matthew
To:	Rosset, Julianne; Robert Gates; Susan Giansante; Corey Colby
Cc:	Bryan Sojkowski; Doug Smithwood; Bailey, Michael
Subject:	RE: River Bend and Pembroke Site Visit Follow Up
Date:	Friday, September 07, 2018 1:13:50 PM

Hello,
I just wanted to note that we understand that passing 20 cfs from the canal may be an issue due to the wooden bridge just downstream. If possible, I would like to take a look at the current bypass system to see how it is working and then tweak it if necessary. I will coordinate with Kevin and Corey. Have a good weekend.
Thanks,
Matt

From: Rosset, Julianne [mailto:julianne_rosset@fws.gov]
Sent: Friday, September 07, 2018 3:36 PM
To: bob.gates@eaglecreekre.com; susan.giansante@eaglecreekre.com; corey.colby@eaglecreekre.com
Cc: Bryan Sojkowski; Carpenter, Matthew; Doug Smithwood; Bailey, Michael
Subject: River Bend and Pembroke Site Visit Follow Up

Hi Bob –

Writing to follow up on our site visit and discussion on September 5th. Thank you (and Sue and Corey) for taking the time to meet with us.

In accordance with the terms of the Memorandum of Agreement (MOA), signed by the United States Fish and Wildlife Service (Service) and Eagle Creek Renewable Energy Management, LLC (ECREM) in 2014, ECREM organized and coordinated: (1) a pre-season site inspection of River Bend; and (2) a flow demonstration at Pembroke, post waste-gate replacement.

River Bend (FERC No. 3760, LIHI Cert No. 123)

Service and New Hampshire Fish and Game (NHFGD) personnel met ECREM on site to view the newly installed flow inducer, located on river left in front of the intake rack nearest the downstream bypass. Flow in the river was low and no fish were present.

In the coming weeks, we ask that ECREM contact the NHFGD via telephone and Service personnel via email when fish are moving downstream. The agencies would like to observe fish moving past the project, ideally under a range of conditions. If, while on site, fish are observed moving through the intake racks, we may recommend ECREM install additional flow inducers to create a sweeping flow across the racks, thereby increasing downstream passage efficiency at the site and decreasing potential entrainment and mortality. Additionally, depending on future observations, the agencies may recommend ECREM begin downstream operations earlier in the year to accommodate the full downstream migration period. In July of 2018, a fish kill occurred because a large number of fish attempted to move past the project while the downstream bypass was not in operation.

Regarding operations, ECREM mentioned they recently determined how to best operate the bypass weir. The Service and NHFGD recommends ECREM document this information in an operations and maintenance plan (or another form ECREM finds suitable) so the agencies have written documentation and are aware of how the project is best operated.

Pembroke (FERC No. 3185/LIHI Cert No. 118)

Service and NHFGD personnel met ECREM on site to observe three different flows (25 cfs, 37 cfs, 50 cfs), which were released into the bypass reach from the newly installed waste gate located at the dam. Qualitative observations were recorded at 25 cfs and 50 cfs (37 cfs was not observed). Wetted perimeter and depth did not change significantly. ECREM agreed to continue to release a minimum flow of approximately 25 cfs into the bypass reach during the migration season.

While not discussed on site, the Service and the NHFGD are aware that the Webster dam (just downstream of Pembroke and owned by ECREM) will be partially removed in the near future. Although a minimum bypass flow of 25 cfs was agreed upon during our site visit, the removal of Webster dam may affect the Pembroke bypass and may make 25 cfs an unsuitable flow for fish and wildlife downstream of the project. Therefore, post-Webster dam removal, the Service and the NHFGD intends to meet with ECREM again to determine if the current minimum flow is still suitable.

ECREM noted that they release 5-8 cfs down the discharge/diversion chute on the downstream side of the stop log section at the canal outlet. However, the Fish Passage Facilities Operations and Maintenance plan indicates that a release of 20 cfs was agreed upon. With the hydraulic capacity of the units at the project being 800 cfs, it is important that 20 cfs is released to ensure safe, timely, and effective downstream passage. In addition to river herring downstream passage, the agencies may (at a future time) recommend upstream and downstream eel passage measures at Pembroke. Eels are known to occur upstream and downstream of the project (Matt Carpenter, personal communication). We hope to work collaboratively with ECREM to provide safe, timely, and effective eel passage at a future date, when appropriate.

If you have any questions or comments, please feel free to call or email me.

Kind regards,
Julianne

Julianne Rosset
Fish & Wildlife Biologist
USFWS New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301
603-227-6436
julianne_rosset@fws.gov

From: Carpenter, Matthew
To: Susan Giansante
Cc: Corey Colby; Kevin Fraser
Subject: RE: River Herring
Date: Monday, October 22, 2018 5:54:18 AM
Attachments: image001.png

Hi Sue,
I did visit the Pembroke Dam on Monday 10/1. Kevin observed fish moving through the sluice gate on the previous Friday. There were no fish moving when we were there, but we did observe a large school of juvenile river herring in the canal at the China Mill Dam, so they must have passed through Pembroke. It appears that the sluice gate is working. I would still like to be there when fish are actually moving (there are still a few weeks left in the season), but I think it's okay to change the flow to 5 cfs based on what we've seen so far. Next time fish are moving we'll have to keep an eye on the tailrace to make sure we aren't getting mortalities of fish that may be passing through the turbines. The trash racks are so deep in the canal that it is hard to see whether fish are passing through the turbines.
Matt

From: Susan Giansante [mailto:susan.giansante@eaglecreekre.com]
Sent: Wednesday, October 17, 2018 12:56 PM
To: Carpenter, Matthew
Cc: Corey Colby; Kevin Fraser
Subject: RE: River Herring

Hi Matt-

I understand from Corey and Kevin, that you visited Pembroke recently, and that the flow released from the sluice gate within the stop log sections at the downstream end of the canal is acceptable (5 cfs). As I had mentioned during our call a few weeks ago, as a follow up to my call with Julianne Rosset after our flow demonstration in September, I had erroneously identified the discharge from this gate as 20 cfs in both the Operations & Flow Monitoring Plan and the Fishway Operations & Maintenance Plan and would update the plans with the corrected flow (of 5 cfs) once you had a chance visit the site and confirm the flow release was acceptable.

Based on your Pembroke site visit, I'll make the noted change to the plans and send them around. Please let me know if you disagree.

Thanks
Sue

From: Carpenter, Matthew <Matthew.Carpenter@wildlife.nh.gov>
Sent: Wednesday, October 17, 2018 11:01 AM
To: Corey Colby <corey.colby@eaglecreekre.com>
Cc: bryan_sojkowski@fws.gov; Susan Giansante <susan.giansante@eaglecreekre.com>
Subject: RE: River Herring

Excellent. Thanks for the update.

From: Corey Colby [mailto:corey.colby@eaglecreekre.com]
Sent: Wednesday, October 17, 2018 10:58 AM
To: Carpenter, Matthew
Cc: bryan_sojkowski@fws.gov; Susan Giansante
Subject: River Herring

Gentlemen,

The herring are passing on the Winnipesaukee River. We shutdown Lochmere today because the Lake Winnisquam drawdown has lowered the level below the fish passage facility located at the canal intake rack. I observed fish passing at Clement early this morning. We have not observed any passing at Stevens Mill but there are not any congregating in the head pond nor are there any signs of mortality in the tailrace.

Regards,

Corey Colby
Regional Manager

New Hampshire Region
24 Mill St. Tilton, NH 03276
O: 603-286-8471
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M: 603-344-2734

From:	Elise Anderson
To:	Shannon Ames; Mike Sale; Dana Hall
Cc:	Susan Giansante
Subject:	FW: Pembroke Hydro Water Quality Testing 2016
Date:	Thursday, April 27, 2017 11:59:04 AM
Attachments:	Pembroke 2016 Water Quality Testing Submission.pdf 20160729-Pembroke Vertical Profiles & DO%.xlsx

Shannon,

Please see attached the results of water quality sampling conducted by Essex hydro on behalf of Eagle Creek Renewables in 2016. The condition language specifies that we should share the results of the sampling effort with LIHI.

So far, we have not received a letter from DES in response to this submission.

Thank you-

Elise Anderson

From: Elise Anderson [mailto:eanderson@essexhydro.com]
Sent: Monday, March 06, 2017 12:05 PM
To: 'Walsh, Ted'
Cc: 'Susan Giansante'
Subject: Pembroke Hydro Water Quality Testing 2016

Hi Ted,

Hope you are well.
Please see attached for the results of water quality testing performed at Pembroke hydro during the summer of 2016. Let us know if questions or concerns arise as you review this.

Thanks,

Elise Anderson
Environmental and Regulatory Analyst
Essex Hydro
55 Union Street, 4th Floor
Boston, MA 02108
Tel: (617) 367-0032
Fax: (617) 367-3796

From:	Walsh, Ted
To:	Shannon Ames (sames@lowimpacthydro.org)
Cc:	Susan Giansante; MaryAlice Fisher (mfischer@lowimpacthydro.org); Henderson, Carol; Magee, John; (John_Warner@fws.gov); julianne_rosset@fws.gov; Comstock, Gregg
Subject:	Webster-Pembroke Hydroelectric Project - Suncook River - Water Quality Results re LIHI Certification
Date:	Thursday, March 22, 2018 11:14:06 AM
Attachments:	20180322_WebsterPembroke LIHI_Pembroke_SNK_WQ Results.pdf

Shannon,

The attached letter is NHDES's assessment of the water quality status of the Suncook River in the vicinity of the Webster-Pembroke Hydroelectric Project in Pembroke, NH. For the purposes of certification from the Low Impact Hydropower Institute, NHDES was asked to determine if the project is causing or contributing to violations of state water quality standards.

Based on the current operation of the dam, current water quality standards, the water quality data collected and information provided to DES by Eagle Creek Renewable Energy, the Suncook River in the vicinity of the Webster-Pembroke Hydroelectric Project is attaining water quality standards at this time.

NHDES concurs with the recommendations and assessments of the U.S. Fish and Wildlife Service and New Hampshire Fish and Game.

If you require additional information or assistance, please contact me.

Ted Walsh

Ted Walsh, Surface Water Monitoring Coordinator
NHDES, Watershed Management Bureau
29 Hazen Drive, P.O. Box 95
Concord, New Hampshire 03301-0095
(p) 603-271-2083
(F) 603-271-7894
email: twalsh@des.state.nh.us

APPENDIX C

MEMORANDUM OF AGREEMENT (MOA) BETWEEN EAGLE CREEK AND USFWS

EAGLE CREEK
RENEWABLE ENERGY
— EXCELLENCE IN HYDRO —

June 25, 2019

Tom Chapman
Supervisor, New England Field Office
United States Fish & Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Ref: Interim Extension of Memorandum of Agreement
Fish Passage and Project Operations
Eagle Creek RE Management and the US Fish and Wildlife Service

Dear Mr. Chapman:

On August 14, 2014, the United States Fish and Wildlife Service (Service) and Eagle Creek RE Management, LLC (ECREM), collectively the "Parties", entered into a Memorandum of Agreement (Agreement), the purpose of which established a plan and schedule for addressing fish passage and minimum flow issues at ECREM's Hydroelectric Projects in New Hampshire ("the sites") that facilitated receipt of certification as low-impact hydroelectric projects from the Low Impact Hydroelectric Institute (LIHI), with support from the Service. The term of the Agreement was to remain in full force and effect for a period of five years from the date of the signed Agreement, i.e., August 14, 2019. After which time, by mutual consent, the Parties may extend the term of the Agreement.

Appendix A of the Agreement set forth a plan and schedule for environmental enhancement measures to be established in consultation with and approved by the Service. Additionally, the Agreement required the development of an Operations and Flow Monitoring Plan and a Fish Passage Facilities Operations and Maintenance Plan. Over the 5-year term of the Agreement, Appendix A continued to be updated based on changes to schedule and conceptual designs, however the premise of the Agreement remained the same, with the Parties continuing to work cooperatively to address fish passage and minimum flow issues at the sites. (Included for reference as Appendix 1 is the Agreement and the current version of the Appendix A, as initialed by the Service in August 2017). This Appendix will be updated to reflect current conditions and any new efforts during the term of the MOA.

Based on recent conversations, and notwithstanding the second sentence of Article 1.1 of the Agreement, the Parties agree to extend the term of the current Agreement until the end of the first quarter of next year, March 31, 2020, as an interim measure, to allow the Parties to complete site visits this fall (2019), during the river herring downstream migration season, and conduct a bypass flow demonstration after completion of the partial removal of the Pembroke dam. The site visits will better allow the Parties to understand current conditions of each of the sites and agree to future measures, as needed. In this interim, the Service will continue to support LIHI certification of the sites encompassed under the Agreement.

Eagle Creek Renewable Energy
116 N. State Street, PO Box 167, Neshkoro, WI 54960-0167
Tel: 920-293-4628 – Fax: 920-293-8087
www.eaglecreekre.com

Furthermore, as agreed to by the Parties, Lakeport and Mine Falls will be removed from the Agreement. Lakeport is currently in the midst of Federal Energy Regulatory Commission (FERC) relicensing. The Service is an active participant in Lakeport relicensing, and Lakeport related matters will be addressed during relicensing. For Mine Falls, the lease agreement between the City of Nashua and Mine Falls Limited Partnership, was terminated April 2017. Operations and maintenance of the Mine Falls Project are now the responsibility of the City of Nashua as the owner of the facility.

Except as modified herein, the terms of the Agreement remain in full force and effect.

The Parties hereby indicate their agreement to the terms above:

Eagle Creek RE Management, LLC	United States Fish and Wildlife Service
By: Robert A. Gates	By: Tom Chapman
Title: EVP Operations	Title Supervisor, New England Field Office
Date: June 26, 2019	Date: 11 July 2019

Eagle Creek Renewable Energy
116 N. State Street, PO Box 167, Neshkoro, WI 54960-0167
Tel: 920-293-4628 – Fax: 920-293-8087
www.eaglecreekre.com

Interim Extension of Memorandum of Agreement

Appendix 1

- **Memorandum of Agreement, August 18, 2014**
- **Revised Appendix A, August 2, 2017**

FISH PASSAGE and PROJECT OPERATIONS

MEMORANDUM OF AGREEMENT

Eagle Creek RE Management and the U.S. Fish and Wildlife Service

1.0 INTRODUCTION

This Memorandum of Agreement (Agreement) is entered between the United States Fish and Wildlife Service (Service) and Eagle Creek RE Management, LLC (ECREM). ECREM is a Delaware limited liability company and is wholly owned by Eagle Creek Renewable Energy, LLC (ECRE). Individually, the above may be referred to as a "Party," collectively "Parties."

1.1 Term of the Agreement

This Agreement will remain in full force and effect for a period of five years from the date of the Agreement. After that time the parties can, by mutual agreement, extend the term of the contract for one or more subsequent five-year periods. Either party may also terminate this Agreement at the end of each five-year term without liability to any other party or any further obligations hereunder.

1.2 Purpose

This Agreement establishes a plan and schedule for addressing fish passage and minimum flow issues at ECREM's hydroelectric projects in New Hampshire that will facilitate receiving certification as a low-impact hydroelectric project by the Low Impact Hydroelectric Institute (LIHI). Upon the execution of the Agreement, the Service will provide a supporting letter for the ECRE application to LIHI within three weeks of signing.

1.3 Agency Appropriations

Nothing in this Agreement shall be construed as obligating the Service to expend in any fiscal year any sum in excess of appropriations made by Congress to state or local legislatures or administratively allocated for the purpose of this Agreement for the fiscal year or to involve the Service in any contract or obligation for the future expenditure of money in excess of such appropriations or allocations.

1.4 Establishes No Precedents

The Parties have entered into the negotiations and discussions leading to this Agreement with the explicit understanding that all discussions relating thereto are privileged, shall not prejudice the position of any Party or entity that took part in such discussions, and are not to be otherwise used in any manner in connection with these or any other proceedings. The Parties understand and agree that this Agreement establishes no principles or precedents with regard to any issue which is not addressed herein or with regard to any Party's participation in future

relicensing proceedings unrelated to the agreements set forth herein and that none of the Parties to this Agreement will cite this as establishing any principles or precedents except with respect to the matters to which the Parties have herein agreed.

1.5 Binding Effect

This Agreement shall be binding on the Parties and on their successors and assigns.

1.6 Multiple Counterparts

This Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

2.0 BACKGROUND

Various wholly owned subsidiary companies of ECRE have acquired the ownership interests in several of the hydroelectric generation projects located in the State of New Hampshire which were previously owned or leased by Algonquin Power Systems. These projects are Mine Falls Project (FERC No. 3442) on the Nashua River; Gregg Falls Project (FERC No. 3180) on the Piscataquog River; Webster-Pembroke Project (FERC No. 3185) on the Suncook River; and the Lakeport Project (FERC No. 6440), Lochmere Project (FERC No. 3128) and Stevens Mills Project (FERC No. 3760) (which includes both Stevens Mills and Riverbend facilities projects on the Winnipesaukee River [each a "Project" or "Facility" and collectively "Projects" or "Facilities"]). These purchases were consummated on June 29, 2013. ECRE is also in the process of evaluating the acquisition of the Clement Project (FERC No. 2966), also located on the Winnipesaukee River.

The Projects acquired by ECRE have either a License or an Exemption from Licensing issued by the Federal Energy Regulatory Commission (FERC). Those licenses and exemptions include various requirements for Project operations, including bypass flow releases, and for providing fish passage when needed. The Service has identified fish passage needs at many of the subject projects. In addition, in order to address low impact hydropower certification criteria established by LIHI, ECRE needs to consult with the Service on project operations and flow releases in addition to fish passage.

ECREM is the entity within the Eagle Creek group of companies that manages the operations on behalf of and as agent for various project companies owned by ECRE. Since the acquisition of these assets, ECREM has worked in cooperation with the Service and other agencies to improve fish passage and prevent fish kills at several of its hydro projects in New Hampshire and elsewhere.

ECREM leadership has had a long history of cooperation with the Service and other agencies regarding fish passage and is keenly aware of the benefits provided to the public from such enhancements. ECREM seeks to maintain a cooperative relationship with the Service, and therefore is entering into this Agreement in support of the program goals established by the Service and other resource agencies.

3.0 GENERAL AGREEMENTS OF THE PARTIES

3.1 Reopeners

The Parties agree that, except as provided herein, this Agreement is not intended to limit or restrict the ability of any Party to petition FERC pursuant to any reopener condition contained in any license, including any exercise by the Secretary of the Department of the Interior relating to her/his fishway prescription authority under §18 of the Federal Power Act. No such petition, including the exercise of §18 authority, may be filed without the filer's providing at least 60 days written notice of its intention to do so to all the other Parties and, promptly following the giving of notice, consulting with the other Parties regarding the need for and the purpose of the petition. In the event such a petition is filed, the filing Party shall include with its filing documentation of its consultation with the other Parties, a summary of their recommendations and of its response to those recommendations. The filing Party shall also serve a copy of its petition to all other Parties.

The Parties agree that nothing in this Agreement is intended to limit or restrict the ability of any Party to seek an amendment to this Agreement during the effective period of the license or as long as an exempted project is operated. Any Party proposing such an amendment to this Agreement shall provide all Parties with at least 60 days written notice of the proposed amendment using updated addresses as needed. If the amendment would require modification of the license or any other permit, the Licensee shall file all applications to amend any license or permits necessary to effectuate the agreed-upon changes, and the other Parties will support such efforts. An amendment to this Agreement shall be effective only upon the written consent of all Parties to this Agreement.

3.2 Compliance with the Endangered Species Act

As of July 1, 2014, the Service has determined that, based on the information available as of that date, except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under the Service jurisdiction are known to exist in the Projects' impact areas. In addition, no habitat in the Projects' impact areas is currently designated or proposed "critical habitat" in accordance with provisions of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). Therefore, no further

Endangered Species Act coordination or consultation with the Service is required at this time. Should Project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered.

4.0 ENVIRONMENTAL ENHANCEMENT MEASURES

4.1 Bypass Flows

ECREM shall, for the protection and enhancement of fish and aquatic habitat, provide continuous minimum flows to the bypass reaches of each Project as established in consultation with and approved by the Service, in accordance with the schedule in Appendix A. Once the Service has approved these flow regimes and the LIHI has formally approved Eagle Creek's LIHI application for the subject Facilities, ECREM will implement the agreed upon continuous minimum bypass flows. The flow requirements may be modified in the future as appropriate to address the effective operation of upstream fish passage facilities.

4.2 Flow Monitoring

ECREM shall, within six (6) months from the effective date of the Agreement, prepare and file for approval by the Service, an Operations and Flow Monitoring Plan for monitoring run-of-river operation and bypassed reach flow releases from the Projects. The Plan also should incorporate a description of the refill protocol that will be followed and how run-of-river operation and bypass flow releases will be provided during periods when the head pond is drawn down for dam maintenance. The Plan shall include a description and design of the mechanisms and structures that will be used, including any periodic maintenance and/or calibration necessary to ensure the devices work properly. In addition, a plan for recording data on Project operations to verify proper operations and minimum flow releases, and for maintaining such data for inspection by the Service and other resource agencies, also shall be filed. The operations and flow monitoring plan shall be developed in consultation with, and require approval by the Service.

4.3 Fish Passage

ECREM agrees to implement the activities related to fish passage at the Projects as described in Appendix A of this Agreement. The implementation of these activities will be performed in accordance with the schedule set forth in Appendix A or as mutually agreed upon between ECREM and the Service.

The proposed enhancements will consist of structural changes to provide for upstream passage at the Mines Falls Project, and exclusion and safe and effective downstream passage of river herring and/or American eel or seasonal Project shutdowns of the Project turbines, combined

with a safe egress route, or potentially a combination of both measures at all Projects. For some of the Projects, the fish passage measures have been agreed to, whereas in others, the passage measures have yet to be proposed by ECREM or reviewed by the Service. For these, Appendix A establishes a process timeline to determine the appropriate passage measures.

For all proposed structural fish passage measures, ECREM shall provide the Service with functional design drawings of proposed facilities for its review and approval.

A. Upstream Passage at Mines Falls

ECREM will develop design plans and a construction schedule for the rehabilitation of and improvements to the Mines Falls fish lift system for Service approval and filing with FERC. Appendix A identifies the schedule for submittal of the plans and a proposed construction completion date. The target construction date is April 1, 2015. However, based on the timing of design plan development, time for review and Service approval, and the complexity and extent of necessary construction, that date may need to be adjusted based on mutual agreement between ECREM and the Service.

B. American Eel Silver Eel Passage

In general, the measures to protect adult silver eels during outmigration are either:

(1) cessation of Project operation from dusk to dawn from August 15 through November 15, annually. Future refinement of the timing and other conditions (such as flow, weather conditions, etc.) that drive the downstream movement may be made by the Service, with concurrence by ECREM, as information on the behavior of migrants at the Projects is obtained. The nightly protocol at some Projects shall include closing or screening the headgates, as agreed upon with ECREM, to prevent eels from becoming trapped in the forebay. A downstream bypass sluice shall be opened to provide a minimum fish bypass flow (needed flows to be determined for each site); or

(2) operation of a passage and protection system that meets the following criteria:

i. a full depth trashrack/screen system with ¾-inch-clear spacing and a desired approach velocity equal to or less than 1.5 feet per

second,[1] in conjunction with a bypass sluice or lower level gate of sufficient size and passing a sufficient flow (to be determined during the designing of the facilities); and

ii. the downstream passage and protection system shall be designed in consultation with, and require approval by the Service and filed with FERC. The system shall operate annually from August 15 through November 15. Future refinement of the timing and other conditions (such as flow, weather conditions, etc.) that drive the downstream movement may be made by the Service, with concurrence by ECREM, as information on the behavior of migrants at the Projects is obtained.

C. River Herring Downstream Passage

ECREM shall construct, operate and maintain downstream fish bypass passage facilities for adult and juvenile river herring in all years when river herring have been stocked upstream of the Projects. The downstream fish passage measures for downstream river herring passage may be the same as measures implemented for American eels.

The downstream passage facilities shall consist of measures to protect downstream river herring from impingement and/or entrainment, as well as bypass facilities to assist fish in moving safely past the Projects. Final design and construction of the protection system shall occur in consultation with, and require approval by the Service and shall be filed with FERC.

If the downstream bypass facility is deemed ineffective based on evaluations by the Service and ECREM, ECREM shall be required to submit a proposal for amended designs or other measures for approval by the Service within six (6) months of the effectiveness determination.

D. Interim Passage Measures

In the interim periods between execution of the Agreement and the implementation of measures specified in the Agreement and Appendix A, interim passage measures for river herring and American eel will be implemented at the Projects as specified in Appendix A. Interim measures will consist of nighttime shutdowns on the day of and for three consecutive days after a rain event or river flow increase resultant from Lake Management activities by New Hampshire Department of Environmental Services. Initial operational shutdown periods will be from dusk to dawn during the passage season, but the Service and ECREM will cooperatively

[1] Site configuration and Project works of individual Projects may preclude the attainment of this criteria. In that event, the Service will consider a variance to this criteria based on review of the overall Project passage plan.

work together to determine the extent of nighttime shutdowns, taking into account downstream migrant needs and Project operations.

4.4 Fish Passage Facilities Operations and Maintenance Plans

ECREM shall develop and implement a Fish Passage Facilities Operations and Maintenance Plan for each Project with fish passage provisions identified in Appendix A. The plans shall detail how and when the upstream and downstream fishways will be operated and describe routine maintenance activities that will occur both during and outside of the fish passage seasons. The Plan shall be developed in consultation with, and require approval by the Service. The approved Plan shall be in effect prior to the first passage facilities coming on-line, and shall be updated as needed as new passage facilities are placed into service and based on information obtained from operation of the facilities.

4.5 Fish Passage Monitoring and Modifications

ECREM agrees to cooperate with the Service on the evaluation of the effectiveness of the adopted fish passage measures, and agrees to implement reasonable modifications to the passage facilities and their operation in order to provide for safe, timely and effective passage of diadromous fish.

5.0 SUPPORT OF LIHI CERTIFICATION

The Service agrees to support ECREM in its efforts to secure certification from LIHI for the Facilities. In the event that LIHI approval is not achieved for a specific site or sites, ECREM will be relieved of the non-fish passage Agreement obligations as they pertain to the specific site or sites. If ECREM fails to implement the provision of continuous bypass flows and/or fish passage enhancements for a specific site or sites to the satisfaction of the Service, the Service will notify ECREM of such failure, and ECREM will have 60 days to resolve the matter to the satisfaction of the Agencies. If the Service then determines that ECREM has not resolved the matter in question, the Service may terminate this Agreement, upon 10 days' notice to ECREM for the site that has failed to meet the approval of the Agencies. Upon such termination, no Party shall have any further obligation to any other Party with respect to the site in question.

The parties hereby indicate their agreement to the terms above:

Eagle Creek RE Management, LLC

By: _____

Title: SVP Operations

Date: 8-14-14

United States Fish and Wildlife Service

By: _____

Title: Assistant Field Supervisor

Date: 8/14/14

EAGLE CREEK RE, LLC **APPENDIX A** **FINAL MOA** USFWS Signature: Date: 8/14/14 ECREM Signature: Date: 8/14/14

FACILITY	IMPLEMENT DOWNSTREAM PASSAGE*	IMPLEMENT UPSTREAM PASSAGE	COMPLETE MINIMUM FLOW REVIEW	TARGET SPECIES	PROPOSED ENHANCEMENTS**
LAKEPORT	2014	REVIEW IN 2020	Adequate Flows	AMERICAN EEL	3/4-inch rack overlays w/eel collection box & discharge pipe to plunge pool. Consult w/FWS on permanent racks.
			Exist	RIVER HERRING	None Needed.
LOCHMERE	2015	REVIEW IN 2020	2014	AMERICAN EEL	3/4-inch exclusionary trashracks at the canal headworks with open sluice gate at dam and plunge pool.
				RIVER HERRING	3/4-inch rack and bypass structure for eels. Additional angled floating diversion boom ~ 3 foot skirt.
					Secondary intake trashrack and diversion box and pipe to tailrace. Existing facility to be modified.
				BYPASS FLOWS	Perform study of habitat and river needs for bypass reach by December 1, 2014.
CLEMENT	2015	REVIEW IN 2020	2015	AMERICAN EEL	Exclusionary trashracks at headworks (ECREM will evaluate 3/4-inch rack spacing), bypass sluice and plunge pool.
				RIVER HERRING	Exclusionary trashracks at dam headworks (ECREM will evaluate 3/4-inch rack spacing), an angled floating
					diversion boom ~ 3 foot skirt, bypass sluice and plunge pool.
RIVERBEND	2015	REVIEW IN 2020	2015	AMERICAN EEL	Evaluate required trashrack length for hydro operations. 3/4-inch exclusionary trashrack overlays or angled racks.
					Modify trashgate at dam, set flow requirement and provide plunge pool as needed.
				RIVER HERRING	3/4-inch exclusionary or angled racks. Modify trashgate at dam & set flow requirement. Plunge Pool as needed.
STEVENS MILLS	2015	REVIEW IN 2020	2014	AMERICAN EEL	3/4-inch exclusionary trashracks.
				RIVER HERRING	3/4-inch exclusionary trashracks. Angled surface diversion boom.
PEMBROKE	See Detail	REVIEW IN 2020	2014	RIVER HERRING	2014 - operate sluice gate at trashsracks during outmigration in consult with FWS and NHFGD & review bypass gate, intake velocities & trashracks for permanent passage measure. Modifications to facilities as needed by September 1, 2015.
				AMERICAN EEL	Eel downstream passage measures within 48 months of notification by NHFGD and/or USFWS.
				BYPASS FLOWS	Perform study of habitat and river needs for bypass reach by December 1, 2014.
GREGG'S FALLS	See Detail	REVIEW IN 2020	2014	RIVER HERRING	Discontinue use of salmon smolt downstream fishway.
				AMERICAN EEL	Eel Downstream Passage measures within 48 months of notification by NHFGD and/or USFWS.
					Continue Instantaneous Run of River Operations. Set allowable water level fluctuations.
				BYPASS FLOWS	Minimum flows from dam not likely needed. Verify adequacy of flows below dam in 2014.
MINES FALLS	2015	2015	2014	RIVER HERRING	Provide downstream diversion boom either at the canal headworks or at the intake. Provide a plunge pool for downrunning fish if released out of trash sluice. Move or eliminate downstream pipe.
					Fish lift drawings to USFWS by 11-1-14. Construction target April 1, 2015, but no later than September 1, 2015.
	2016			AMERICAN EEL	Downstream eel passage measures will be needed. Review eel downstream passage alternatives with Agencies in 2014.

* Interim eel passage measures for Lakeport, Lochmere, River Bend and Stevens Mills will consist of nighttime shutdowns from dusk to dawn for as agreed upon with the USFWS) for three consecutive days after rain event or after increased flows during the eel migration period (August 15 through November 15).

** Identified structural passage measures for eels may be replaced by operational shutdowns after analysis of information. All fish passage facilities and other measures to be designed in consultation with and be approved by the USFWS. Operational shutdowns will be evaluated based on the following criteria: Species, Time of Year, Economics, Weather Conditions.

EAGLE CREEK RE, LLC **APPENDIX A** **REVISED FINAL MOA** **USFWS Signature:** **ECREM Signature:**

FACILITY	IMPLEMENT DOWNSTREAM PASSAGE*	IMPLEMENT UPSTREAM PASSAGE	COMPLETE MINIMUM FLOW/ BYPASS FLOW	TARGET SPECIES	PROPOSED ENHANCEMENTS**
LAKEPORT	Completed 7/29/2015	REVIEW IN 2020	Adequate Flows	AMERICAN EEL	3/4" trash rack overlays w/eel collection box & discharge pipe to plunge pool. Consult w/FWS on permanent racks - Eel collection box was installed and operational during the 2015 eel passage season. ECREM will continue to work in cooperation with Service / NH F&G in 2017 to improve or make modifications to the operation of the eel passage and trapping facilities. Per discussion with Service/NHF&G discharge pipe and plunge pool are not required at this time. Based on input from Service/NHF&G gaps in existing racks and overlay panels were repaired/closed by ECREM in Fall 2015. Overlay racks are in an aged condition. ECREM plans to replace the existing racks and overlay panels with new rack panels with 3/4" clear openings within the normal capital program (not an MOA driven item).
				RIVER HERRING	None Needed.
LOCHMERE	Completed 8/2016	REVIEW IN 2020	2015	AMERICAN EEL	Design change based on consultation with Service/ NH F&G includes 3/4" exclusionary trash racks within the canal to transition chute from opening in racks to new gate at existing penetration in canal wall to new pool and HDPE pipe to former auxiliary unit tailrace. NHDES Wetland Permit received 11/2015, purchased/delivered fabricated pieces 2015 & 2016, FERC approval received 4/2016, completed pre-bid meeting 4/27/2016, construction bids due 5/10/2016, construction planned for June/July 2016 and are planned to be operational by August 15, 2016.
				RIVER HERRING	3/4" rack and bypass structure for eels. See above for modified scope of work for American eel and river herring.
			Completed 7/29/2015	BYPASS FLOWS	Perform study of habitat and river needs for bypass reach by December 1, 2014. Performed flow demonstration with Service/NHF&G and agreed existing bypass flows of 35 cfs (10/1 to 3/31) and 50 cfs (4/1 to 9/30) are sufficient.
CLEMENT	Completed 8/2016	REVIEW IN 2020	Adequate Flows	AMERICAN EEL	Exclusionary trash racks at dam headworks (ECREM will evaluate 3/4" rack spacing), bypass sluice and plunge pool Agreed up on final design with USFWS & NHF&G includes exclusionary trash racks with 3/4" spacing at unit intake, modifications to waste gate at spillway, plunge pool and conveyance channel to be installed, NHDES Wetland Permit received 1/2016, purchased/delivered fabricated pieces 2015/2016, FERC approval received 4/2016, exclusionary trash rack installation to be completed 5/2016, remainder of items to be completed and operational by 8/15/16.
				RIVER HERRING	Exclusionary trash racks at dam headworks (ECREM will evaluate 3/4" rack spacing). Final design approved based on discussions with Service / NH F&G, see above.
					Install boom with 4 foot skirt.

FACILITY	IMPLEMENT DOWNSTREAM PASSAGE*	IMPLEMENT UPSTREAM PASSAGE	COMPLETE MINIMUM FLOW/ BYPASS FLOW	TARGET SPECIES	PROPOSED ENHANCEMENTS**
RIVERBEND (river left-looking downstream)	Completed 8/2016	REVIEW IN 2020	Adequate Flows	AMERICAN EEL	Agreed upon final design with Service / NHF&G includes exclusionary trash rack overlay panels at Unit 1 intake, blocking racks perpendicular to flow at Unit 3 intake, modifications to existing sluice gate, plunge pool and conveyance channel to be installed, NHDES Wetland Permit received 1/2016, purchased/delivered fabricated pieces 2015/2016, FERC approval received 4/2016, to be completed by 8/15/16.
					Modify trash gate at dam, set flow requirement and provide plunge pool as needed. See above.
				RIVER HERRING	Modify trash gate at dam & set flow requirement. Plunge Pool as needed See above.
STEVENS MILLS (river right)	Completed 8/2016	REVIEW IN 2020	Adequate Flows	AMERICAN EEL	3/4" Exclusionary trash racks. See Riverbend above.
				RIVER HERRING	3/4" Exclusionary trash racks. See Riverbend above for trash racks. The potential need for an angled surface boom will be evaluated based on observations of the operation of the new fish passage facilities.
PEMBROKE	See Detail	REVIEW IN 2020	2015	RIVER HERRING	2016 - Based on consultation and agreement with USFWS, installed a plunge pool and discharge on the downstream side of the wastegate adjacent to the trashracks at the end of the canal similar to the arrangement used in years past to accommodate downstream herring passage. 2017- Review trash gate, intake velociites and trash racks for permanent passage measures.
				AMERICAN EEL	Eel Downstream Passage measures within 48 months of notification by NHFGD and/or USFWS
			Initial Review Completed 7-29-15 2nd Assessment by Sept 2017	BYPASS FLOWS	Perform study of habitat and river needs for bypass reach by December 1, 2014. On 7-29-2015, based on field testing and observations with Service /NHF&G, the minimum flow was changed from FERC license required 10 cfs to 25 cfs, no further modifications are required pending additional assessment of flow to be completed by Nov 2016 with use of 8x8 drain gate and the repaired Obermeyer gate. Due to drought conditions, delay completion of flow assessment to September 2017.
GREGG'S FALLS	See Detail	REVIEW IN 2020	Completed 7/29/15	RIVER HERRING	Discontinue use of Salmon Smolt downstream fish way Use of Salmon Smolt Downstream Fish way officially discontinued 7/29/2016.
				AMERICAN EEL	Eel Downstream Passage measures within 48 months of notification by NHFGD and/or USFWS
					Continue Instantaneous Run of River Operations. Set allowable water level fluctuations. ECREM is monitoring operations to ensure instantaneous run of river operations.
				BYPASS FLOWS	Minimum flows from dam not likely needed - Verify adequacy of flows below dam in 2014. Existing 20 cfs min flow is adequate based on 7/29/2015 site visit with Service / NHF&G.

APPENDIX D

1983 LICENSE AND ORDER AMENDING LICENSE EXEMPTION (1991)

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: C. M. Butler III, Chairman;
Georgiana Sheldon, A. G. Sousa
and Oliver G. Richard III.

Suncook Power Corporation	)	Project No. 3179-001
Pembroke Hydro Corporation	)	Project No. 3185-001

ORDER GRANTING EXEMPTION FROM LICENSING FOR SMALL HYDROELECTRIC PROJECT OF 5 MW OR LESS AND DENYING MAJOR LICENSE APPLICATION

(Issued February 24, 1983)

Suncook Power Corporation (SPC) filed an application for Short Form License (Minor) under Part I of the Federal Power Act (Act), 16 U.S.C. §§791(a)-825(r), for the Webster-Pembroke Project No. 3179-001. SPC subsequently amended its application to one for major license at an existing dam. Pembroke Hydro Corporation (PHC) filed a competing application for exemption from all or part of Part I of the Act pursuant to 18 C.F.R. Part 4 Subpart K (1982), implementing Section 408 of the Energy Security Act (ESA) of 1980, for the proposed Webster-Pembroke Project No. 3185-001.

Public Notice

Notice of SPC's application for minor license was published October 30, 1980. Notice of its amended application changing to an application for major license was issued April 2, 1981. Comments on the amended application were received from the U.S. Department of the Interior (DOI), the Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (Corps) and the New Hampshire Fish and Game Department (NHFG). None of the commenters objected to the issuance of a license for the proposed project.

Notice of PHC's application for exemption was published in accordance with Section 408 of the ESA and the Commission's regulations. Comments were requested from interested Federal and State agencies including the U.S. Fish and Wildlife Service and the State Fish and Wildlife Agency. All comments and protests that were filed have been considered. No agency has any objection relevant to issuance of the exemption.

Site Description

The proposed projects would utilize the existing low head Webster and Pembroke Dams on the Suncook River in the towns of Pembroke and Allenstown, Merrimack County, New Hampshire. Although both dams were previously used to produce hydroelectric energy, neither dam is currently being used for that purpose.

Webster Dam is located approximately 1,800 feet upstream of Pembroke Dam. A diversion canal runs north (downstream) approximately 500 feet from the headgate structure of Webster Dam. The existing Pembroke powerhouse abuts the Pembroke Dam and is approximately 30 feet downstream of the Main Street Bridge.

Proposal Which Would Better Develop the Water Resource

Section 4.104(e)(2) of the regulations provides that, as between a competing license and exemption application, the first-filed will be favored "unless the Commission determines the plans of the subsequent application would better develop the water resource." Thus, SPC, as the first applicant to file, would be favored unless PHC's plan would better develop that portion of the Suncook River under consideration.

SPC proposes the installation of four Francis-type turbine generators having a total rated capacity of 1880 kilowatts (kW). Annual energy generation is estimated by SPC at 8,200,000 kilowatt hours (kWh). The estimated total direct construction cost of the proposed project is $2,560,000.

PHC proposes the installation of one Kaplan-type turbine generator having a total rated capacity of 2,600 kW. Annual energy production is estimated by PHC at 8,500,000 kWh. The estimated total direct construction cost of PHC's proposed project is $2,524,400.

Power produced at either project would be sold to the local utility. Therefore, the market for the power output is not an issue in this case. The selling price of power from either proposed project will depend, in large part, on negotiations between the individual applicant and the utility to which the power is sold. Because such price is unknown at this point, and cannot be accurately estimated, it has not been considered as a factor in our decision. 1/

Environmental constraints on the development of either project would be substantially the same, since both proposed projects are practically identical. Identical minimum flow requirements, and consideration of fisheries, recreational resources, and historical and archeological resources would affect each project proposal in the same manner, and it is concluded that environmental considerations favor neither the license applicant nor the exemption applicant.

1/ See discussion at 5 infra.

Based on a comparison of these factors, PHC's plan would appear to better develop the water resource in question in that it would result in the installation of a hydroelectric project producing 5.9% more energy annually. 2/

SPC argues, however, that its proposed four turbine configuration is superior to the single turbine plan of PHC because the greater operational flexibility and reliability of such a plan result in a clear advantage in overall energy production.

Flow duration curves used by Staff to calculate energy production at the applicants' proposed projects were derived from data published by the U.S. Geological Survey. These data, which are the same as those used by the applicants, indicate that PHC's proposed project will produce more energy annually than SPC's. Additionally, due to the high degree of dependability of hydro generating units (98%), a single unit plan would not be less reliable than a multi-unit development.

SPC further argues that PHC's plan is not as good as its own because PHC's plan will result in significant environmental problems due to penstock routing. PHC proposes to construct a new 460 foot long 8 foot diameter penstock with a route similar to that proposed by SPC. Unlike SPC, however, a portion of PHC's penstock would be located in the river channel and floodway beneath the Main Street Bridge. SPC argues that this can reasonably be expected to increase flooding impact upstream of the Main Street Bridge and is prohibited by existing local land use regulations implementing the Federal Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA). Furthermore, PHC's penstock routing, according to SPC, is likely to cause ice jamming in the Main Street Bridge floodway.

According to PHC, development in the Suncook River floodway is permitted by local zoning by-laws, promulgated pursuant to Federal Emergency Management Agency (FEMA) guidelines, upon "an affirmative

2/ The estimation of 5.9% greater energy which will be produced by PHC's proposed project is based on the following: First, PHC has, pursuant to a letter from the U.S. Environmental Protection Agency, included a 10 cfs minimum flow in its energy computation. This minimum flow was also considered by staff in its energy computations for PHC. A similar minimum flow was not included in SPC's license application or its energy computation. Secondly, SPC included a small and insignificant loss of energy for maintenance which Staff did not include in the PHC computation. If the minimum flow and 1% loss of energy for maintenance are factored into these computations, the resultant average energy output of PHC's and SPC's proposed projects is 6.35 GWH and 6.07 GWH, respectively, using a monthly flow duration curve, or 7.56 GWH and 7.14 GWH, respectively using a daily flow duration curve. Because a daily, versus monthly, flow duration curve provides a more accurate estimate Staff has adopted the former in computing and comparing energy gains of the proposed projects. The .42 GWH difference in favor of PHC's proposed project (7.56 GWH - 7.14 GWH = .42 GWH) equals 5.9%.

finding by the Board of Adjustment that the building can be so placed, constructed and serviced so as not to endanger the health or safety of the general public by causing any increase in flood levels during the 100 year flood." 3/ A study conducted for Pembroke to determine potential changes in water surface elevation resulting from the proposed development indicates that there will actually be a 0.5 foot decrease in the 100 year flood elevation beneath the bridge with the proposed penstock in place.

Staff concurs with PHC's assessment of the impact of the penstock on the floodway and, in addition, has concluded that PHC's penstock should not increase the risk of ice jamming at that location because the penstock would be located in the high velocity outside portion of the river bend. Ice normally collects on the inside of a bend in the river channel, where flows are lower in velocity.

Finally, PHC argues that its plan is better adapted to develop the Suncook River because it currently holds all property interests necessary to develop and operate the proposed project. This, according to PHC, will allow it to complete construction of the project within 18 months of issuance of an exemption. Under the Commission's existing regulations, property ownership is not an independent factor for consideration in deciding between a license application and an exemption application. 4/ It has therefore not been considered herein.

3/ PHC has not, as yet, provided evidence that the Board of Adjustment for Merrimack County has made such an affirmative finding. The issuance of the requested exemption, however, is conditioned on PHC obtaining any necessary determination from the Board or FEMA, as appropriate, regarding floodway impact before construction of the proposed project.

4/ Section 4.104(e)(2) of the regulations states: "If an application for a license and an application for exemption from licensing are each accepted for filing and each propose to develop a mutually exclusive project, the Commission will favor the application first filed, unless the Commission determines the plans of the subsequent applicant would better develop the water power potential of the affected water resources." Thus, the significance of site ownership has already been built into the regulations, and cannot properly be invoked again. In Order No. 106, wherein the Commission promulgated these rules, it stated:

> The Commission believes that the [exemption] rule should not discourage interested non-owners who wish to exploit the full water power potential of a site in circumstances where the project owner does not take timely action to protect itself and develop the site adequately. Therefore, under §4.104 the protection afforded the project owner has been restricted as follows: *** where there has been no permit, a non-owner license applicant will be preferred to an exemption applicant

Given the fact that PHC's proposal would result in more energy production at essentially the same cost, we hereby find its plan would better develop the waterway in question. Therefore, pursuant to Section 4.104(e)(2) of the regulations, we will favor the application of PHC over that of SPC and issue PHC the exemption it has requested.

Standard Article 2, included in this exemption, requires compliance with any terms and conditions that Federal or State fish and wildlife agencies have determined appropriate to prevent loss of, or damage to, fish and wildlife resources. The terms and conditions referred to in Article 2 are contained in any letters of comment by these agencies which have been forwarded to PHC in conjunction with this exemption.

Should PHC contest any terms or conditions that were proposed by Federal or State agencies in their letters of comment as being outside the scope of Article 2, the Commission shall determine whether the disputed terms or conditions are outside the scope of Article 2.

Special Articles 7, 8 and 9 have been included in the interest of safety and the protection of environmental values affected by the proposed project.

The Commission orders:

(A) Webster-Pembroke Project No. 3185-001 as described and designated in Pembroke Hydro Corporation's application filed on April 22, 1981, as amended July 13, 1982, is exempted from all of the requirements of Part I of the Federal Power Act, including licensing, subject to the standard articles in §4.106 of the Commission's regulations, 18 C.F.R. §4.106, 45 Fed. Reg. 76115

4/ (continued from previous page) that files second and in competition with a license applicant, unless the plans of the exemption applicant would better develop the water power potential of the affected water resources... .

PERC Statutes & Regulations, Regulations Preambles 1977-1981, ¶30,204 at 31,363 (Nov. 7, 1980). Indeed, even where the exemption applicant files first, its ownership preference may be overcome by a license application which proposes more than 7.5 mw installed capacity.

(November 18, 1980), and the following Special Articles:

Article 7. Exemptee shall consult with the Board of Adjustment for Merrimack County or the Federal Emergency Management Agency (FEMA), as appropriate, to determine what effect the installation of the project penstock would have on the flood hazard to property above the Pembroke Dam. At least sixty days prior to the start of construction, Exemptee shall file with the Director, Office of Electric Power Regulation (OEPR), a copy of an agreement with FEMA on any measures deemed necessary to prevent an increase in flood hazard caused by project construction. If FEMA and Exemptee cannot agree upon such appropriate measures, the Director, OEPR, reserves the right to require appropriate modification to project structures to mitigate increased flood hazard caused by the project penstock.

Article 8. This exemption is subject to the provisions of 18 C.F.R., Part 12.

Article 9. Exemptee shall maintain an instantaneous minimum flow release of at least 10 cfs in the bypassed stretch of the Suncook River between Webster Dam and Pembroke Dam and below the tailrace.

(B) The license application of Suncook Power Corporation for the Webster-Pembroke Project No. 3179-001 filed on July 9, 1980 and amended March 5, 1981 and July 9, 1982, is denied.

By the Commission.

(S E A L)

Kenneth F. Plumb

Kenneth F. Plumb,
Secretary.

FEDERAL ENERGY REGULATORY COMMISSION

Pembroke Hydro Corporation Project No. 3185-002

New Hampshire

ORDER AMENDING EXEMPTION FROM LICENSING

(Issued January 9, 1991)

The Webster Pembroke Project has a total installed capacity of 2750 kW, which is higher than the authorized capacity of 2600 kW in the exemption. 1/ The increase in the generating capacity would not result in any additional adverse environmental effects other that those identified during processing of the original application. Therefore, the exemption will be amended to show the project's total installed capacity to be 2750 kW.

The Director orders:

(A) The total authorized installed capacity of the Webster Pembroke Project, FERC No. 3185, is 2750 kW.

(B) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days from the date of issuance of this order, pursuant to 18 C.F.R. §385.713.

J. Mark Robinson

Director, Division of Project

Compliance and Administration

1/ The order granting exemption from licensing was issued on February 24, 1983, 22 FERC 61,230.

APPENDIX E

USFWS IPAC REPORT

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: February 21, 2020
Consultation Code: 05E1NE00-2020-SLI-1499
Event Code: 05E1NE00-2020-E-04320
Project Name: Webster-Pembroke LIHI Application

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2020-SLI-1499

Event Code: 05E1NE00-2020-E-04320

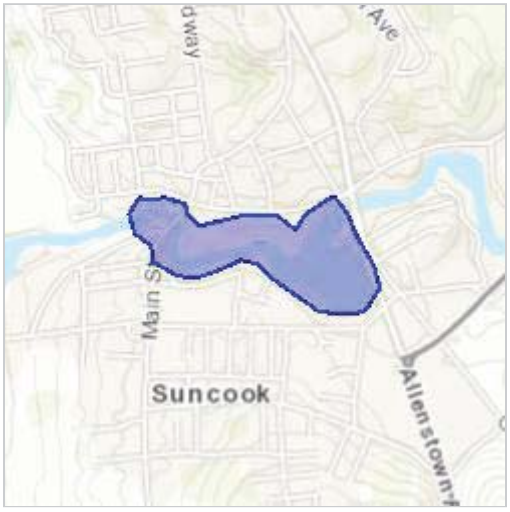
Project Name: Webster-Pembroke LIHI Application

Project Type: DAM

Project Description: Webster-Pembroke is undergoing LIHI re-certification, and we are generating this list to help us determinate any rare, threatened, or endangered species that are listed within the Project footprint.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/43.129135111030024N71.44991736407778W



Counties: Merrimack, NH

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Flowering Plants

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

APPENDIX F

MOA BETWEEN EAGLE CREEK, FERC AND THE NEW HAMPSHIRE STATE HISTORIC PRESERVATION OFFICER (SHPO)

MEMORANDUM OF AGREEMENT
BETWEEN
THE FEDERAL ENERGY REGULATION COMMISSION
AND
THE NEW HAMPSHIRE STATE HISTORIC PRESERVATION OFFICER
REGARDING THE PEMBROKE DAM PARTIAL REMOVAL AT
THE WEBSTER PEMBROKE HYDROELECTRIC PROJECT,
IN ALLENSTOWN AND PEMBROKE, NEW HAMPSHIRE
(FERC NO. 3185-005)

WHEREAS, Pembroke Hydro Associates Limited Partnership, a subsidiary of Eagle Creek Renewable Energy and the "Exemptee" for the Webster Pembroke Hydroelectric Project, filed an amendment application on February 27, 2019 with the Federal Energy Regulation Commission ("Commission") to partially remove a portion of the stacked stone blocks that form the Pembroke Dam in Allenstown and Pembroke, New Hampshire ("Undertaking"); and

WHEREAS, the Pembroke Dam was determined to be a contributing feature of the Pembroke Mill, which is listed in the National Register of Historic Places; and

WHEREAS, the Commission, as lead federal agency for the Undertaking, has determined that the Undertaking shall have an adverse effect to the Pembroke Mill's historical nature, and has consulted with the New Hampshire State Historic Preservation Officer ("New Hampshire SHPO") pursuant to 36 Code of Federal Regulations ("CFR") part 800, and 33 CFR Part 325, regulations implementing Section 106 of the National Historic Preservation Act (NHPA) (16 USC §470f); and;

WHEREAS, the Commission, in consultation with the New Hampshire SHPO, has determined that the Undertaking's adverse effects cannot be avoided and the implementation of treatments set forth in the stipulations of this Memorandum of Agreement ("MOA") will mitigate the adverse effects from the Undertaking on the historic property; and

WHEREAS, this MOA is entered into by the Commission, the New Hampshire SHPO, and the Exemptee to define their respective roles in the mitigation responsibilities for the adverse effect to the Pembroke Dam; and

WHEREAS the Commission has coordinated with the Towns of Allenstown and Pembroke, New Hampshire, the Allenstown Historical Society, and the Pembroke Historical Society on this Undertaking; and

WHEREAS, in accordance with 36 CFR § 800.6(a)(l), the Commission has notified the Advisory Council on Historic Preservation ("Council") of its adverse effect determination

with specified documentation to 36 CFR §800.6, and the Council has chosen not to participate pursuant to 36 CFR Section 800.(6)(1)(iii); and

WHEREAS, the Commission will send a copy of this executed agreement to the Advisory Council; and

WHEREAS, the Exemptee has participated in the agency consultation process and assumes responsibility to execute the stipulated mitigation measures, and has been invited to concur with this MOA; and

NOW, THEREFORE, the Commission and the New Hampshire SHPO agree that the execution and implementation of this MOA evidences that the Commission has taken into account the effects of this Undertaking on historic properties associated with the Project and satisfies the Commission's Section 106 responsibilities for the amendment.

STIPULATIONS

The Commission shall ensure that the following measures are carried out in consultation with the New Hampshire SHPO:

I. Photographic Documentation

The Exemptee will fund the preparation of photographic (digital) documentation of the dam and its setting prior to and during project implementation. Photographs will be keyed to a site plan and photo index and will be stapled to New Hampshire SHPO Inventory Form continuation sheets. Photographs will follow New Hampshire SHPO's digital photograph guidelines.

II. Interpretive Signage

The Exemptee will fund the completion of design, fabrication, and installation of an interpretive sign to be located in the vicinity of the Pembroke Mill. Location of the sign will be in consultation with the New Hampshire SHPO and local municipalities. Design will be overseen by Architectural Historian qualified under 36 CFR 61. The interpretive signage will provide information on the Pembroke Dam and its association with the Pembroke Mill and milling context in the region.

An opportunity for review will be provided to the Allenstown Historical Society, Pembroke Historical Society, and the New Hampshire SHPO, each of which will have 30 days to comment. Upon approval of the design and content, the Exemptee will ensure

that the interpretive sign is fabricated and installed in accordance with the approved design.

III. Historic Banners

The Exemptee will fund the design and installation of no more than 6 banners to be placed along the bridge over the Pembroke Dam. The banners will convey the milling history of the area. Design will be developed by a professional graphic designer in consultation with an Architectural Historian who is qualified under the Secretary of the Interior's Historic Preservation Professional Standards. An opportunity for review will be provided to the Allenstown Historical Society, Pembroke Historical Society, and New Hampshire, each of which will have 30 days to comment.

ADMINISTRATIVE CONDITIONS

I. UNANTICIPATED DISCOVERIES

The Commission shall ensure that if previously unidentified historic properties are discovered during the Project, the signatories to this agreement shall be notified immediately and any work that could potentially impact the resource shall be suspended. The MOA parties shall consult about ways to avoid, minimize or mitigate any effects that the Project may have on the resource and, if necessary, amend this Agreement to provide for the treatment of the resource.

II. DURATION

This MOA shall be null and void if its terms are not carried out within three (3) years from the date of its execution. Prior to such time, the Commission may consult with the other signatories to reconsider the terms of the MOA and amend it in accordance with Stipulation V, below.

III. MONITORING AND REPORTING

Each year following the execution of this MOA until, the work is complete, the permit expires or is terminated, the Exemptee, shall provide all parties to this MOA a summary letter report detailing work undertaken pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received by the Commission in its efforts to carry out the terms of this MOA.

IV. DISPUTE RESOLUTION

Should any signatory or concurring party to this MOA object at any time to any actions proposed under this Section 106 MOA, or the manner in which the terms of this MOA are implemented, the Commission shall consult with such party to resolve the objection. If the Commission determines that such objection cannot be resolved, the Commission shall:

A. Forward all documentation relevant to the dispute, including the Commission's proposed resolution, to the Council. The Council shall provide the Commission with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation.

Prior to reaching a final decision on the dispute, the Commission shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the Advisory Council, signatories and concurring parties, and provide them with a copy of this written response the Commission shall then proceed according to its final decision.

B. If the Council does not provide its advice regarding the dispute within the thirty (30) day time period, the Commission may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the Commission shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the MOA, and provide them and the Council with a copy of such written response.

C. The Exemptee shall continue to fulfill its responsibilities relating to the undertaking that are subject to the terms of this MOA and which are not the subject of, or adversely affected by, the dispute.

V. AMENDMENTS

This MOA may be amended when such an amendment is agreed to in writing by the signatory parties to the MOA. The amendment shall be effective on the date a copy signed by all of the signatories is filed with the Council.

VI. TERMINATION

If any signatory to this MOA determines that its terms shall not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation V, above. If within thirty (30) days an amendment cannot be

reached, any signatory may terminate the MOA upon written notification to the other signatories.

Once the MOA is terminated, and prior to work continuing on the undertaking, the Commission must either (a) execute an MOA pursuant to 36 CFR § 800.6 or (b) request, take into account, and respond to the comments of the Council under 36 CFR § 800.7. The Commission shall notify the signatories as to the course of action it shall pursue.

EXECUTION and implementation of this MOA, pursuant to 36 CFR § 800.6, including its transmittal by the Commission to the Council in accordance with 36 CFR§ 800.6(b)(1)(iv), shall evidence that the Commission has taken into account the effects of this undertaking on historic properties in order to resolve any adverse effects on historic properties and thereby comply with Section 106 of the NHPA, and shall further evidence that the Commission has afforded the Council an opportunity to comment on the undertaking and its effect on historic properties.

MEMORANDUM OF AGREEMENT
BETWEEN
THE FEDERAL ENERGY REGULATORY COMMISSION
AND THE
NEW HAMPSHIRE STATE HISTORIC PRESERVATION OFFICER
REGARDING THE PEMBROKE DAM PARTIAL REMOVAL AT
THE WEBSTER PEMBROKE HYDROELECTRIC PROJECT
(FERC No. 3185-005)

SIGNATORY: FEDERAL ENERGY REGULATORY COMMISSION

By: CarLisa Linton **Date:** 09/20/2019

CarLisa Linton, Acting Director
Division of Hydropower Administration and Compliance

MEMORANDUM OF AGREEMENT
BETWEEN
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AND THE
NEW HAMPSHIRE STATE HISTORIC PRESERVATION OFFICER
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THE WEBSTER PEMBROKE HYDROELECTRIC PROJECT
(FERC No. 3185-005)

SIGNATORY: State of New Hampshire Division of Historical Resources

By: Nadine Miller **Date:** 10/23/19
Nadine Miller, Deputy State Historic Preservation Officer
New Hampshire Division of Historical Resources

MEMORANDUM OF AGREEMENT
BETWEEN
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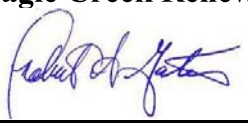
AND THE
NEW HAMPSHIRE STATE HISTORIC PRESERVATION OFFICER
REGARDING THE PEMBROKE DAM PARTIAL REMOVAL AT
THE WEBSTER PEMBROKE HYDROELECTRIC PROJECT
(FERC No. 3185-005)

CONCUR: Eagle Creek Renewable Energy



By:_____ **Date:** 9/26/2019

Robert Gates
EVP Operations
Eagle Creek Renewable Energy