LOW-IMPACT HYDROPOWER POWER INSTITUTE CERTIFICATION APPLICATION

WORUMBO HYDROELECTRIC PROJECT (FERC No. 3428)

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\kleinschmidtusa.com\Condor\Jobs\1871\099\Docs\001 Worumbo LIHI Re-Certification Application.docx

LOW-IMPACT HYDROPOWER POWER INSTITUTE CERTIFICATION APPLICATION

WORUMBO HYDROELECTRIC PROJECT (FERC No. 3428)

1.0 FACILITY DESCRIPTION

The Worumbo Hydroelectric Project (Project), FERC-3428, is located on the Androscoggin River at river mile (RM) 14.1, in Lisbon Falls and Durham, Maine. The Worumbo Project is the third dam on the Androscoggin River, upstream from the Brunswick Hydroelectric Project (FERC-2284) and the Pejepscot Hydroelectric Project (FERC-4784). Other FERC regulated hydro projects above Worumbo are Rumford Falls (FERC-2333) in Rumford, Maine, the Riley-Jay-Livermore sites (FERC-2375) in Riley/Jay/Livermore, Maine, Otis (FERC-8277) in Chisholm, Maine, Gulf Island-Deer Rips (FERC-2283) in Lewiston, Maine, Lewiston Falls (FERC-2302) in Lewiston, Maine and Upper Androscoggin (FERC-11006) in Lewiston, Maine.

The original 40-year license for the Project was issued on December 24, 1985. On September 24, 1987 FERC approved in part, and modifying in part, a water quality monitoring plan. To date, FERC has issued two orders amending the project license. An order amending the license and revising annual charges was issued on October 3, 1990, reflecting as-built conditions. On August 13, 1998, based on consultations with state and federal resource agencies, the license was once more amended by FERC. The amendment covers changes to modify the dam, operate the project at a normal reservoir level of 98.5 feet, and fluctuate reservoir levels between 97 and 98.5 ft. An amendment was approved, with limited exceptions, by FERC on May 11, 2018¹, adopting the terms of a Final Species Protection Plan (Final SPP) and Biological Opinion for Atlantic salmon. On June 11, 2018, the Licensee filed a request for rehearing² on the order, taking issue with three of the ten terms and conditions of the Biological Opinion (Condition #6, 7, and 8). The Licensee does not take issue with the terms as a whole, but is seeking modification of the compliance timeframes in order to address noted concerns including operator safety (e.g., changing a requirement to remove debris "immediately upon inspection" to "immediately after environmental and weather conditions permit such work to commence in a safe manner." It is not

¹ <u>https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14915277</u>

² <u>https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14943271</u>

anticipated that FERC or resource agencies will take issue with the requested modifications to the conditions.

The project is located on the Androscoggin River in Maine, within designated critical habitat for the endangered Gulf of Maine (GOM) Distinct Population Segment of Atlantic salmon. Because Atlantic salmon access the Project area, formal consultation between the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS)³ was requested by FERC on October 14, 2016 as required by Section 7 of the Endangered Species Act (ESA), on the Biological Assessment (BA) concerning the Final SPP that was submitted⁴ by the Licensee. Based on the analysis in the BA, FERC concluded that operation of the Worumbo Project, including the measures described in the Final SPP, may adversely affect a small number of individual GOM Atlantic salmon, but would not be likely to adversely modify or destroy critical habitat. FERC asked NFMS and USFWS to provide their BO no later than 135 days from the receipt of the request for formal consultation. NFMS responded on February 1, 2017, stating that

24, 2017⁵.

On April 3, 2017, NMFS submitted the Biological Opinion for the Worumbo Project, which included the proposed amendment to the project license to incorporate the provisions of a SPP until the issuance of a new license on December 1, 2025⁶. NMFS concluded that the continued operation of the project consistent with the terms of the SPP may adversely affect but is not likely to jeopardize the continued existence of the Gulf of Maine Distinct Population Segment of Atlantic salmon. FERC amended the license to incorporate the SPP, with limited exceptions, on May 11, 2018⁷. The Licensee is seeking minor revisions to timing requirements for three of the conditions.

they had received the request and a Biological Opinion would be delivered on or before March

The project currently operates based on the 1985 license and the amended 1998 order. The Project consists of three concrete gravity dam sections, a gated spillway, a two-unit powerhouse, a non-overflow abutment, upstream and downstream fish passage facilities, and a flood wall connecting the powerhouse to Mill Island. The series of overflow dam sections and gated

⁶ <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14546230</u>

³ <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14376100</u>

⁴ <u>http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14298009</u>

⁵ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14532006

⁷ https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14915277

spillway section extend across the Androscoggin River from the Durham river bank on the south side of the river, to a powerhouse on Mill Island in Lisbon Falls on the north side of the river. At the Durham river bank, the first dam section consists of an approximate 350-foot long concrete spillway equipped with a pneumatic flashboard system. This section of the pneumatic system comprises 17 panels 2.17 feet high, 8 panels 1.75 feet high, and an adjustable eel weir built into the second panel away from the Durham bank.

The first dam section joins the next dam section, which is about 170 feet long and consists of a concrete spillway and a pneumatic flashboard system with 21 panels 2.25 feet high. The new dam and spillway construction was completed in January 2012. This consists of a 139-foot long concrete gravity section with a square crest profile and a mechanical hinged flashboard system. This is followed by a 94-foot-long concrete gravity section with an ogee crest profile and a hinged flashboard system. The next section consists of a 92-foot long, gated spillway section that extends to the powerhouse.

The gated spillway contains four vertical slide gates, 23-foot high by 19.25-foot wide, which are operated by an overhead gantry crane for flood control purposes. The two-unit powerhouse is located adjacent to the gated spillway section. The overflow spillway is comprised of the dam sections extending from the Durham side of the Androscoggin River to the gated spillway section near the powerhouse. The top of the hinged flashboard system is at elevation 99.0 feet. These flashboards will fail when overtopped under high flow conditions. Overtopping flow will continue thereafter until river flows recede to a point that the flashboards can be manually reset, and normal operating conditions can resume. The 2.25-foot pneumatic flashboards atop the center river concrete spillway are controlled by the station main computer which controls the height of this system based on the pond level during high flow events. The height and angles of the panels can be manipulated to provide alternative flow patterns to accommodate license required bypass flow while maintaining the pond elevation as a function of flow as defined by the Project's FERC License. The dam creates an impoundment with a surface area of 190 acres and a volume of 2,000 acre-feet at a normal full pond elevation of 98.5 feet.

The power facilities consist of an intake section; and an integral powerhouse equipped with two (2) turbine-generator units having a rated total capacity of 19.4 MW at a net operating head of 30.5 feet. The average annual generation from the Project is approximately 93 GWh. The Project is commonly operated as a run-of-river facility. However, the pond level can vary from 98.5 feet

MSL to 97.0 feet MSL based on the flash board status, emergency operations, or the demands of the power markets if needed. If the pond is drawn down below 98.5 feet MSL, minimum flow releases from the Project are maintained at the lesser of 1,700 cfs or inflow during impoundment refilling⁸.

The Project is also operated to provide seasonally varied minimum flows into the 850-foot-long bypassed river reach between the Durham-side dam (river right, looking downstream) and the end of the tailrace training wall.



FIGURE 1 WORUMBO HYDROELECTRIC PROJECT OVERVIEW

⁸ The Project is also required to maintain the seasonal bypass flow rates in the zone 8 pond level during any draw down and/or refilling events.



FIGURE 2 GEOGRAPHIC OVERVIEW OF WORUMBO HYDROELECTRIC PROJECT LOCATION

INFORMATION Type	VARIABLE DESCRIPTION	Response (and reference to further details)
Name of the FacilityFacility name (use FERC project nameWorumbo Hydroelectric Project No. 3428)		Worumbo Hydroelectric Project (FERC No. 3428)
	River name (USGS proper name)	Androscoggin River
	River basin name	Androscoggin River Basin
Logation	Nearest town, county, and state	Lisbon Falls and Durham, Androscoggin County, Maine
Location	River mile of dam above next major river	RM 14.1 on the Androscoggin River
	Geographic latitude	43°59'40"N
	Geographic longitude	70°03'41"W
	Application contact names (IMPORTANT: you must also complete the Facilities Contact Form):	Susan Giansante, Eagle Creek Renewable Energy Robert Gates, Brown Bear II Hydro Inc. 65 Madison Avenue, Suite 500, Morristown, New Jersey 07960
Facility Owner	- Facility owner (individual and company names)	Brown Bear II Hydro Inc. 65 Madison Ave, Suite 500 Morristown, NJ 07960 In 2014 Miller Hydro Group sold the project to Brown Bear II Hydro Inc. – approved by FERC order: <u>https://elibrary- backup.ferc.gov/idmws/common/opennat.a</u> <u>sp?fileID=13857891</u> Eagle Creek acquired ownership of Brown Bear II Hydro Inc., in 2016) - <u>https://elibrary- backup.ferc.gov/idmws/common/opennat.a</u> <u>sp?fileID=14406231</u>
	- Operating affiliate (if different from	
	owner)	N/A
	- Representative in LIHI certification	Susan Giansante, Eagle Creek Renewable Energy Robert Gates, Brown Bear II Hydro Inc. Andy Qua, Kleinschmidt Associates Kayla Easler, Kleinschmidt Associates
Regulatory Status	FERC Project Number (e.g., P-xxxxx), issuance and expiration dates	FERC No. P-3428. The license was issued a 40-year license on December 24, 1985, to expire on November 30, 2025.

TABLE 1FACILITY DESCRIPTION INFORMATION FOR GAGE HYDROELECTRIC PROJECT
(LIHI # 10)

INFORMATION Type	VARIABLE DESCRIPTION	Response (and reference to further details)
	FERC license type or special classification (e.g., "qualified conduit")	Major License
	Water Quality Certificate identifier and issuance date, plus source agency name	-#L-10930-35-N-M -June 14, 1985 & July 13, 1998 -Maine Department of Environmental Protection
		1985 License: https://elibrary.ferc.gov/idmws/common/op ennat.asp?fileID=12416478
		1994 Order Approving Minimum Flow Release Plan and Amendment of License: <u>https://elibrary.ferc.gov/idmws/common/op</u> <u>ennat.asp?fileID=3461715</u>
		1995 Order Approving End of Dissolved Oxygen Monitoring Program: <u>https://elibrary.ferc.gov/idmws/common/op</u> <u>ennat.asp?fileID=3013421</u>
	Hyperlinks to key electronic records on	1995 Order Modifying/Approving Minimum Flow Gaging Plan: <u>https://elibrary.ferc.gov/idmws/common/op</u> <u>ennat.asp?fileID=3014776</u>
	FERC e-library website (e.g., most recent Commission Orders, WQC, ESA documents, etc.)	1998 Filing of Amendment Application: https://elibrary.ferc.gov/idmws/common/op ennat.asp?fileID=46361
		1998 Environmental Assessment for Application of Amendment: <u>https://elibrary.ferc.gov/idmws/common/op</u> <u>ennat.asp?fileID=70503</u>
		1998 Order Amending License: https://elibrary.ferc.gov/idmws/common/op ennat.asp?fileID=70499
		2002 Order Approving Final Headpond Erosion Survey: <u>https://elibrary.ferc.gov/idmws/common/op</u> <u>ennat.asp?fileID=6012315</u>
		2013 Order Approving Interim Species Protection Plan and Atlantic Salmon Passage Study Plans:

INFORMATION	VARIABLE DESCRIPTION	RESPONSE (AND REFERENCE TO FURTHER
ITPE		bttps://elibrary.farc.gov/idmws/common/op
		ennat asp?fileID=13272024
		2016 Submitted Proposed Species
		Protection Plan and Draft Biological
		Assessment to FERC:
		https://elibrary.ferc.gov/idmws/common/op
		ennat.asp?fileID=14298009
		2016 Environmental Inspection Report: https://elibrary.ferc.gov/idmws/common/op ennat.asp?fileID=14445769
		2016 Notice of Application for
		Amendment of License to Incorporate
		Final Fish Passage Plans:
		https://elibrary.ferc.gov/idmws/common/op
		ennat.asp?fileID=14370341
		2017 Biological Opinion:
		https://elibrary.ferc.gov/idmws/common/op ennat.asp?fileID=14546230
		2018 Order Amending License to
		incorporate the SPP: <u>https://elibrary-</u>
		<u>backup.terc.gov/tdffws/common/opennat.a</u> sp2fileID=14915277
		<u>sp.mon9=14)13211</u>
		2018 Request for Rehearing on
		Amendment: https://elibrary-
		backup.ferc.gov/idmws/common/opennat.a
		sp?fileID=14943271
		The Project's most recent 1998 Water
		Quality Certification is included in
		Appendix C.
	Date of initial operation (past or future	
	for operational applications)	1988
Power Plant	Total name-plate capacity (MW)	19.4 MW
Character-	Average annual generation (MWh)	93,000 MWh
istics	Number type and size of turbines	Two (2) Kaplan bulb turbines (10.5 MW),
	including maximum and minimum	two generators (9.7 MW) with a maximum
	hydraulic capacity of each unit	hydraulic capacity of approximately 9040
		CIS.

INFORMATION TYPE	VARIABLE DESCRIPTION	Response (and reference to further details)
	Modes of operation (run-of-river, peaking, pulsing, seasonal storage, etc.)	The license permits peaking operation with a maximum impoundment drawdown of 1.5 feet (98.5 feet to 97.0 feet). The Project is commonly operated in Run-of-River mode.
	Dates and types of major equipment	None since the 2012 I IIII Cortification
	Dates, purpose, and type of any recent operational changes	None since the 2013 LIHI Certification
	Plans, authorization, and regulatory activities for any facility upgrades	None at this time.
	Date of construction	1988
	Dam height	The dam has an average height of 10 feet with a crest elevation of 97.0 feet
Character- istics of Dam.	Spillway elevation and hydraulic capacity	Crest elevation of 97.0 feet; the spillway hydraulic capacity is 37,283 cfs. This number does not reflect any flood gates open or for any water thru the units. This is the maximum capacity over the dam before flood gates need to be opened and units maxed out in order not to flood local side streets and all flash board panels are down.
Diversion, or	Tailwater elevation	The tailwater elevation is 68.8 feet.
Conduit	Length and type of all penstocks and water conveyance structures between reservoir and powerhouse	There is no penstock at the Project.
	Dates and types of major, generation- related infrastructure improvements	None since the 2013 LIHI Certification.
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	The Project is used to generate power to supply to the electric grid.
	Water source	Androscoggin River.
	Water discharge location or facility	Androscoggin River
Characte-	Gross volume and surface area at full pool	surface area of 190 acres and a volume of 2,000 acre-feet at a normal full pond elevation of 98.5 feet msl.
Reservoir and Watershed	Maximum water surface elevation (ft. MSL)	98.5 feet msl.
muci sneu	Maximum and minimum volume and water surface elevations for designated power pool, if available	Maximum draw down of 1.5 feet – between 98.5 feet msl and 97.0 feel msl.

INFORMATION	VARIABLE DESCRIPTION	Response (and reference to further
Түре		DETAILS)
		Lewiston Falls (FERC-2302) at RM 22.8 in
		Lewiston, Maine and owned by Brookfield
		White Pine Hydro, LLC:
		Upper Androscoggin (FERC-11006) at RM
		22.5 in Lewiston Maine and owned by
		City of Lewiston
		Gulf Island-Deer Rins (FERC-2283) at RM
		33.7-53.2 in Lewiston Maine and owned
		by Brockfield White Dine Hydro LLC:
		by Brookheid white File Hydro, LLC,
		Otis (FERC-8277) at RM 54.0 in
		Chisholm, Maine and owned by Andro
		Hydro, LLC;
		Riley-Jay-Livermore sites (FERC-2375) at
		RM 53.25 – 65.3 in Riley/Jay/Livermore,
		Maine and owned by Andro Hydro, LLC:
		Rumford Falls (FERC-2333) at RM 85.3 in
		Rumford. Maine and owned by Brookfield
		White Pine Hydro. LLC.
	Upstream dam(s) by name, ownership,	
	FERC number (if applicable), and rive	Please note that the Licensee recognizes
	mile	that there are additional upstream facilities
		above Rumford Falls.
		These include 6 projects in Mainer
		These include o projects in Maine:
		Mahaney FERC No 4413
		Kennebago Falls FERC No 4413
		Rangeley N/A
		Upper Dam FERC No. 11834
		Middle Dam FERC No11834
		Aziscohos FERC No 4026
		9 projects in New Hampshire [.]
		Errol FERC No. 3133
		Pontook FERC No. 2861
		Sawmill FERC No 2422
		Kiverside FERC No 2423
		J. Brodie Smith FERC No 228/
		Cross Power FERC No 2320
		Cascade FERC No 2321
		Corham FERC No 2011
		GUIHAIII FEKU INO 2288

INFORMATION TYPE	VARIABLE DESCRIPTION	RESPONSE (AND REFED DETAILS)	RENCE TO FURTHER
	Downstream dam(s) by name, ownership, FERC number (if applicable), and river mile	Pejepscot Hydroelectri 4784) located at RM 1 Maine and owned by F Pine Hydro; Brunswick Hydroelect 2284) located at RM 6 Maine and owned by F Pine Hydro, LLC.	ic Project (FERC- 0.7 in Topsham, Brookfield White ric Project (FERC- .0 in Brunswick, Brookfield White
	Operating agreements with upstream or downstream reservoirs that affect water availability, if any, and facility operation Area inside FERC project boundary.	There are currently no agreements with other	operating facilities.
	where appropriate	Approximately 209 ac	res.
	Average annual flow at the dam	Average annual flow at the dam is approximately 6.860 cfs ⁹	
Hydrologic Setting	Average monthly flows USGS 0105 Auburn, Ma Latitude 44 Longitude 7 NAD83 Androscogg Unit 01040 Drainage ar 2016 Avera 2016 Avera 31 Drainage ar 2016 Avera Mar Ap Ma Jun Febra Mar Ap Ma Jun Latitude 44 Longitude 7 NAD83	USGS 01059000 Andr Auburn, Maine. Latitude 44°04'20" Longitude 70°12'29" NAD83 Androscoggin County Unit 01040002 Drainage area: 3,263 s 2016 Average Month	oscoggin River near , Maine, Hydrologic quare miles ly Flow Data:
		January February March April May June July August September October November	$\begin{array}{r} 7,230 \\ \hline 7,830 \\ \hline 11,350 \\ 8,520 \\ \hline 5,440 \\ 2,830 \\ \hline 2,410 \\ \hline 1,740 \\ \hline 1,740 \\ \hline 1,870 \\ \hline 3,600 \\ \hline 4,120 \end{array}$

⁹ Data retrieved from StreamStats: <u>https://streamstats.usgs.gov/ss/</u>

INFORMATION TYPE	VARIABLE DESCRIPTION	Response (and reference to further details)	
	Location and name of relevant stream gauging stations above and below the facility	USGS 01059000 Androscoggin River near Auburn, Maine is located upstream of the Worumbo Project. There is no relevant gauging station below the Project.	
	Watershed area at the dam	The drainage area at the Project is approximately 3,385.4 square miles ¹⁰ .	
	Number of zones of effect (ZOE)	There are three (3) zones of effect: 1) impoundment, 2) bypassed reach, and 3) downstream.	
	Upstream and downstream locations by river miles	Impoundment: RM 8 - RM 9.85 Bypassed Reach: RM 8 - RM 7.83 Downstream: RM 8 - RM 4.57 See Appendix A for a map of Project Zones of Effect.	
	Type of waterbody (river, impoundment, by-passed reach, etc.)	Impoundment: Impoundment Bypassed Reach: Riverine Downstream: Riverine	
Designated Zones of Effect	Delimiting structures	Impoundment: Dam to Intersection of River Road and Route 196 Bypassed Reach: Dam to just below tailrace wall. Downstream: Dam to the Pejepscot Hydroelectric Project (FERC No. FERC- 4784) See Appendix A for a map of Project Zones of Effect.	
	Designated uses by state water quality agency	The Androscoggin River, in the vicinity of the Project, is classified as a Class C waterway. Class C waters are suitable for the designated uses of drinking water supply after treatment, fishing, agriculture, recreation in and on the water, industrial process and cooling water supply, hydroelectric power generation, navigation, and as habitat for fish and other aquatic life.	
Additional Contact	Names, addresses, phone numbers, and e-mail for local state and federal	Please see section 4.0 for the Project	
Information	resource agencies	Contacts Form.	

¹⁰ Data retrieved from StreamStats: <u>https://streamstats.usgs.gov/ss/</u>

INFORMATION TYPE	VARIABLE DESCRIPTION	RESPONSE (AND REFERENCE TO FURTHER DETAILS)
	Names, addresses, phone numbers, and e-mail for local non-governmental stakeholders	Please see section 4.0 for the Project Contacts Form.
Photographs and Maps	Photographs of key features of the facility and each of the designated zones of effect	Please see Please see Appendix A for identification of each ZOE and for project drawings and figures. Please see Appendix B for photographs of key features of the facility.
	Maps, aerial photos, and/or plan view diagrams of facility area and river basin	Please see Appendix B for aerial photos of facility area and river basin.

2.0 STANDARDS MATRICES

2.1 IMPOUNDMENT ZOE

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

2.2 BYPASSED REACH ZOE

		ALTERNATIVE STANDARDS				RDS
	CRITERION	1	2	3	4	Plus
Α	Ecological Flow Regimes		X			
B	Water Quality		X			
С	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
Ε	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection			X		
G	Cultural and Historic Resources Protection	X				
Η	Recreational Resources	X				

2.3 DOWNSTREAM ZOE

		1	ALTERN	ATIVE S	STANDA	RDS
	CRITERION	1	2	3	4	Plus
Α	Ecological Flow Regimes		X			
B	Water Quality		X			
С	Upstream Fish Passage		X			
D	Downstream Fish Passage	X				
Ε	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection			X		
G	Cultural and Historic Resources Protection	X				
Η	Recreational Resources		X			

3.0 SUPPORTING INFORMATION

3.1 ECOLOGICAL FLOWS STANDARDS: IMPOUNDMENT ZOE

CRITERION	STANDARD	INSTRUCTIONS
А	2	Agency Recommendation (see Appendix A for definitions):
		 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.

- The Impoundment ZOE is made up of the impounded Androscoggin River above the Project dam, this ZOE does not have a bypassed reach; criterion for the bypassed reach ZOE is described in Section 3.2.
- On May 15, 1998, an application to amend the license was submitted. The Amendment was approved by FERC on August 13, 1998¹¹. The amendment allowed the project to increase the normal elevation of the project impoundment by 1.5 feet (from 97.0 feet mean sea level (msl). to 98.5 feet msl.) by installing crest control gates on the Durham side (river right, looking downstream) and manual hinged flashboards on the Lisbon side (river left) of the existing dam; and allowed the project to implement cycling of generation, instead of run-of-river mode of operation, thereby periodically drawing down the reservoir by 1.5 feet.
- Article 30, was amended on August 13, 1998 to the following¹²: the Licensee, except during periods of peaking, shall maintain the project reservoir at a normal maximum operating level of 98.5 feet msl. The Licensee may periodically cycle generation, fluctuating the reservoir surface elevation between 98.5 feet and 97 feet msl. When refilling the reservoir after a peaking event, the Licensee shall discharge a total flow from the project of at least 1,700 cubic feet per second (cfs) or inflow, whichever is less. This discharge shall include the required minimum flow to the bypass reach and any flows through the project's fish passage facilities (described in Section 3.2 below).
- Pond level data from February 1989 through part of 1997 was recorded by the station pond level chart recorder and stored onto rolls of chart paper. From 1997 to present, pond level data is recorded by the station "Human Machine Interface" (HMI) system, every 15 minutes and stored digitally.

¹¹ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3132044

¹² https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3132044

- In order to maintain the 1700 cfs during refill events, Brown Bear II Hydro Inc (Brown Bear Hydro) uses turbine flow to calculate the cfs. Typically, the station output of 3,000 kW is equal to 1,800 cfs with a pond level of 97 feet.
- Operational data at the Project consists of date, time, pond level set point, pond level, tail water, unit outputs in KWs, units trash rack downstream water level, and air bag air pressure data. All of which is recorded by the station HMI system, every 15 minutes and stored digitally.
- The Maine Department of Environmental Protection (MDEP) provided the Project with a Water Quality Certification dated June 12, 1985. On July 13, 1998, the MDEP updated the certification based on an amendment to the license in 1998¹³.
- Normal operation may be temporarily modified, if required by operating emergencies beyond the control of the Licensee, and for short periods upon mutual agreement between the Licensee and the Maine Department of Inland Fisheries and Wildlife (MIFW).
- Flows at the Worumbo Project are controlled primarily by the operation of two upstream hydropower facilities, the Gulf Island Deer Rips Project (FERC No. 2283), located approximately 19 miles upstream, and the Lewiston Falls Project, 14.5 miles upstream.
- Based on the conditions of the water quality certification contained in Appendix C of the license amendment issued on July 15, 2008¹⁴, the operating regime at Gulf Island Deer Rips requires that the normal weekly impoundment drawdowns of the pond are no greater than one foot from May 1 through June 30 and four feet from July 1 through April 30. Seasonal instantaneous minimum flow releases of 1,700 cfs (or inflow if less) from May 1 through November 30 and 1,430 cfs (or inflow if less) from December 1 through April 30 are required from the Gulf Island Deer Rips Project. The Lewiston Falls Project also operates with a reservoir fluctuation of up to 4 feet per week with a downstream minimum flow requirement of 1,000 cfs (or inflow if less).
- The project impoundment supports populations of largemouth bass, smallmouth bass, pickerel, yellow perch, and assorted non-game species, including white sucker and spottail shiner. No federally listed threatened or endangered aquatic species exist in the project area.
- MIFW has restricted drawdown during bass spawning seasons, typically from May to July.
- During the term of LIHI certificates, all certified facilities are required to operate their hydroelectric facilities in a manner that satisfies the LIHI criteria and all rules provided for in the applicable Handbook. To maintain compliance with LIHI certification, all certificate holders must submit a sworn statement to LIHI at each anniversary of the certificate effective date confirming that during the preceding year, there has been: (1) no violation of the Low Impact Hydropower criteria or facility-specific situations; (2) no violation of the LIHI marketing guidelines; (3) no change in conditions relevant to the certification; and (4) no receipt of notice of violation or non-compliance relevant to the facility's certification from any government agency. The annual compliance statement also includes an update on the status of any facility-specific conditions that are active.

¹³ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3132044

¹⁴ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11750503

Since Eagle Creek's acquisition of Brown Bear Hydro, the sworn statement has been submitted to and approved by LIHI each year.

• This is not a conduit project.

3.2 ECOLOGICAL FLOWS STANDARDS: BYPASSED REACH ZOE

CRITERION	STANDARD	INSTRUCTIONS		
А	2	Agency Recommendation (see Appendix A for definitions):		
		 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.		

• The MDEP provided the Project with a Water Quality Certification (WQC) dated June 12, 1985. On July 13, 1998, the MDEP updated the certification based on an amendment to the license in 1998¹⁵. As prescribed in the WQC (Article 30¹⁶, of the amended license) the Licensee, except during periods of peaking, shall maintain the project reservoir at a normal maximum operating level of 98.5 feet mean sea level (msl). The Licensee may periodically cycle generation, fluctuating the reservoir surface elevation between 98.5 feet and 97 feet msl. When refilling the reservoir after a peaking event, the Licensee shall discharge a total flow from the project of at least 1,700 cfs or inflow, whichever is less. This discharge shall include the required minimum flow to the bypass reach and any flows through the project's fish passage facilities.

Normal operation may be temporarily modified, if required by operating emergencies beyond the control of the Licensee, and for short periods upon mutual agreement between the Licensee and the MIFW.

- The license permits peaking operation with a maximum impoundment drawdown of 1.5 feet (98.5 feet to 97.0 feet). The Project is commonly operated in Run-of-River mode.
- According to Article 32, USFWS, the MIFW, the Maine Department of Marine Resources (MDMR), and the Atlantic Sea Run Salmon Commission, develop an instream flow study plan for the Worumbo Project to assess the relationship of various minimum flow releases, including the minimum flow specified in Article 31, to fish habitat in the reach of the Androscoggin between the Worumbo Dam and Powerhouse. On December 30, 1991, in coordination with agencies, an instream flow study and results were submitted to FERC and on January 26, 1994, FERC approved with modifications the minimum flow release plan (Appendix G).
- Based on the instream flow study approved by FERC on January 26, 1994, addressed above, the results of the study and consultations and negotiations conducted during meetings held on January 9, February 6, May 2, and October 1, 1991 (Appendix G), the Licensee proposed the following six measures relative to minimum flow releases. (1)

¹⁵ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3132044

¹⁶ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3132044

Release minimum flows at the project according to Article 31, (2) Provide funding of \$25,000 per year for the remainder of license term (i.e., until the year 2025) to the MIFW for a fisheries management program in the lower Androscoggin River basin, (3) The DIFW will be the lead agency to act as the resource agency contact, with sole authority to permit exception to the proposed bypass flows, (4) The Licensee will modify the dam spillway as necessary to concentrate bypass flows over the west side of the dam, (5) The Licensee may deviate from the proposed bypass flows without penalty under any of the following conditions:

- o operating emergencies;
- o by order of any jurisdictional government agency; and
- o as authorized in advance by the DIFW

(6) In addition, the Licensee may undershoot the proposed minimum flow up to 50 percent for periods not to exceed one hour, provided that only one such under release may be made in a 24-hour period without authorization from the DIFW.

• Article 31 as amended in the January 26, 1994 license amendment requires a minimum flow release, as measured immediately downstream from the dam, according to the following schedule.

DATE RELEASE	CFS
September 1 - October 31	200
November 1 - November 30	50 ¹⁷
December 1 - April 15	50 ¹⁸
April 16 - May 31	300
June 1 - June 30	200
July 1 - August 31	100

- The flow requirement for November 12 thru December 31, or until the river starts to freeze, is required to be increased to 85 cfs if the downstream fishway is operational during that period. These minimum flows may be temporarily modified by operating emergencies or by order of any jurisdictional government agency, or as authorized in advance by the MIFW. The Licensee may release as low as 50 percent of the stated minimum flow for a period not to exceed one hour in a 24-hour period. Under releases for greater than one hour in a 24-hour period require authorization from the MIFW.
- The bypass habitat flow of 300 cfs released from April 16 to May 31 equals the sum of the downstream fishway flow (119-131 cfs under controlled pond conditions) plus overtopping flow (169 to 181 cfs).
- MDEP's recommendations within the WQC address criteria for refugia and enhancement of habitat for local salmonid species including brown trout as well as meet state water quality standards for this reach of the river.

¹⁷ Unless the downstream fishway is operational, in which case 85 cfs

¹⁸ Unless the downstream fishway is operational, in which case 85 cfs

- In 1995, FERC filed an order modifying and approving the minimum flow gaging plan¹⁹, which was filed on June 3, 1994²⁰. Ordering paragraph (C) of the January 1994 instream flow study order required the Licensee to file, for Commission approval, a plan for measuring and documenting compliance with the minimum flow releases required in paragraph (B). The gaging plan was to be developed in consultation with the MIFW.
- FERC modified the minimum flow gaging plan (1995^{21}) to include:

"If the minimum flow, as determined by headpond elevation data, falls below the required minimum flows under ordering paragraph (B) of the January 26, 1994 Order Approving and Modifying Minimum Flow Release Plan and Amending Licensee, the Licensee shall file a report with the Commission within 30 days of the incident. The report shall, to the extent possible, identify the cause, severity, and duration of the incident, and any observed or reported adverse environmental impacts resulting from the incident. The report shall also include: 1) operational data necessary to determine compliance with article 31; 2) a description of any corrective measures implemented at the time of occurrence and the measures implemented or proposed to ensure that similar incidents do not recur; and 3) comments or correspondence, if any, received from the resource agencies regarding the incident. Based on the report and the Commission's evaluation of the incident, the Commission reserves the right to require modifications to project facilities and operations to ensure future compliance."

- Dam bypass flows are based on pond levels, the 1999 flow release plan is used to calculate the flows (Appendix K). As for fishway flows, the downstream fishway flows are discharged into the zone "8" pond area, where the flows are included in the dam bypass flow calculations. A weir formula is used to calculate this flow, again based on the pond level elevation.
- See Section 3.1 regarding HMI operations data collection.
- See Section 3.1 regarding annual LIHI compliance certification statements.
- Project Deviation from flow requirements

Brown Bear Hydro self-reports run-of-river deviations to FERC in compliance with Article 30 of the project license. To date, FERC has confirmed that none of these reported occurrences have been considered violations with Article 30. See Appendix I for a Deviation Table summarizing the events from 2013-2018.

¹⁹ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3014776

²⁰ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10705368

²¹ <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3014776</u>

3.3 ECOLOGICAL FLOWS STANDARDS: DOWNSTREAM ZOE

CRITERION	STANDARD	INSTRUCTIONS		
Α	2	Agency Recommendation (see Appendix A for definitions):		
		 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. 		

- The Downstream ZOE consists only of the tailrace portion of the project down to the Pejepscot Dam; this ZOE does not have a bypassed reach.
- The MDEP provided the Project with a Water Quality Certification (WQC) dated June 12, 1985. On July 13, 1998, the MDEP updated the certification based on an amendment to the license in 1998. As prescribed in the WQC (Article 30, of the amended license), the Licensee, except during periods of peaking, shall maintain the project reservoir at a normal maximum operating level of 98.5 feet mean sea level (msl). The Licensee may periodically cycle generation, fluctuating the reservoir surface elevation between 98.5 feet and 97 feet msl. When refilling the reservoir after a peaking event, the Licensee shall discharge a total flow from the project of at least 1,700 cfs or inflow, whichever is less. This discharge shall include the required minimum flow to the bypass reach (described in Section 3.2 above) and any flows through the project's fish passage facilities.
- Brown Bear Hydro monitors the upstream fishway flows by using the mill side inlet gate which is controlled by the station PLC, based on the station generation output level; the river side inlet gate which is checked two times a day and adjusted as needed, to keep 3 feet below the surface of tail race water level; and the upper fish lift flow is also checked two times a day and adjusted as needed, based on the discharged flow into the lower fish inlet area.
- Brown Bear Hydro submits annual compliance statements to LIHI that confirms compliance with minimum flow requirements and identifying any deviations requiring notification to FERC.
- See Section 3.1 regarding HMI operations data collection.
- See Section 3.1 and 3.2 regarding annual LIHI compliance certification statements.

3.4 WATER QUALITY STANDARDS: IMPOUNDMENT ZOE

CRITERION	STANDARD	INSTRUCTIONS
CRITERION B	2 2	 INSTRUCTIONS Agency Recommendation: If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation. Provide a copy of the most recent Water Quality Certificate, including the date of issuance.
		 Identify any other agency recommendations related to water quality and explain their scientific or technical basis. Describe all compliance activities related to the water quality related agency recommendations for the facility, including ongoing monitoring, and how those are integrated into facility operations.

- The Androscoggin River is classified as Class C from Ellis River in Rumford to a line formed by the extension of the Bath-Brunswick boundary across Merrymeeting Bay, which includes the project area.
- Class C waters are of quality suitable for the designed uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation; and as habitat for fish and other aquatic life.
- The dissolved oxygen content of Class C waters shall be not less than 5 parts per million or 60 percent of saturation, whichever is higher, except that in identified salmonid spawning areas where water quality is sufficient to ensure spawning, egg incubation and survival of early life stages, that water quality sufficient for these purposed shall be maintained.
- The MDEP provided the Project with a Water Quality Certification (WQC) dated June 12, 1985. On July 13, 1998, the MDEP updated the certification based on an amendment to the license in 1998 (Appendix C). As prescribed in the WQC (Article 30, of the amended license) the Licensee, except during periods of peaking, shall maintain the project reservoir at a normal maximum operating level of 98.5 feet mean sea level (msl). The Licensee may periodically cycle generation, fluctuating the reservoir surface elevation between 98.5 feet and 97 feet msl. When refilling the reservoir after a peaking event, the Licensee shall discharge a total flow from the project of at least 1,700 cfs or inflow, whichever is less. This discharge shall include the required minimum flow to the bypass reach and any flows through the project's fish passage facilities.
- Normal operation may be temporarily modified, if required by operating emergencies beyond the control of the Licensee, and for short periods upon mutual agreement between the Licensee and the MIFW.
- On January 18, 2002 MDEP issued a ruling that all compliance conditions within the WQC have been satisfied (Appendix C).

MDEP was contacted seeking verification that the Project is not responsible for the Project waters being classified as impaired for dioxin and legacy PCBs under the 2014

Integrated Water Quality Monitoring Report (pg. 92)²². These impairments are not associated with project operations and have been identified in DEPs reports dating back to at least 2006 (see Table 2), prior to the project's initial LIHI certification. MDEP is currently reviewing historic data and has not provided written verification as of submittal of this final LIHI application. No issues were raised by MDEP staff during the MEPDES inspection in 2016 (see Appendix C).

²² <u>http://www.maine.gov/dep/water/monitoring/305b/2014/2014appendices-final.pdf</u>

TABLE 2 MDEP INTEGRATED WATER QUALITY MONITORING REPORTS

Report Date	Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Submittal Target Date/Priority
2016	ME0104000210_425R_01_00	Androscoggin R,	Main stem, from Pejepscot Dam to Brunswick Dam	Polychlorinated biphenyls	Legacy pollutant 5-D	2020 / L
2014	ME0104000210_425R_01_01	Androscoggin R,	Main stem, from Pejepscot Dam to Brunswick Dam	Polychlorinated biphenyls	Legacy pollutant 5-D	2020 / L
2012	ME0104000210_425R_01	Androscoggin R,	Main stem, from Pejepscot Dam to Brunswick Dam	Polychlorinated biphenyls	5-D PCB legacy pollutant	2020 / L
2008	ME0104000210_425R_01	Androscoggin R,	Main stem, from L Androscoggin R to Brunswick Dam	Polychlorinated biphenyls		
2006	ME0104000210_425R_01	Androscoggin R,	Main stem, from L Androscoggin R to Brunswick Dam	Polychlorinated biphenyls		

Note: Data for Table 2 was obtained from report summaries available through https://ofmpub.epa.gov/waters10/attains_index.home.

3.5 WATER QUALITY STANDARDS: BYPASSED REACH ZOE

CRITERION	STANDARD	INSTRUCTIONS
В	2	Agency Recommendation:
D	2	 If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation. Provide a copy of the most recent Water Quality Certificate, including the date of issuance. Identify any other agency recommendations related to water quality and explain their scientific or technical basis. Describe all compliance activities related to the water quality related agency recommendations for the facility, including on-
		going monitoring, and how those are integrated into facility operations.

• Please see answer to Impoundment ZOE above – seasonal bypass flows are primarily intended to address criteria for refugia and enhancement of habitat for local salmonid species including brown trout as well as meet state water quality standards for this reach of the river. As described in Section 3.2, the seasonal bypass flows were established based up on instream flow study and results filed with FERC on December 30, 1991 and approved by FERC, with modifications, on January 26, 1994 (Appendix G).

3.6 WATER QUALITY STANDARDS: DOWNSTREAM ZOE

CRITERION	STANDARD	INSTRUCTIONS
В	2	Agency Recommendation:
	2	 If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation. Provide a copy of the most recent Water Quality Certificate, including the date of issuance. Identify any other agency recommendations related to water quality and explain their scientific or technical basis. Describe all compliance activities related to the water quality related agency recommendations for the facility including on-
		going monitoring, and how those are integrated into facility
		operations.

- The MDEP provided the Project with a Water Quality Certification (WQC) dated June 12, 1985. On July 13, 1998, the MDEP updated the certification based on an amendment to the license in 1998 (Appendix C). As prescribed in the WQC (Article 30, of the amended license), the Licensee, except during periods of peaking, shall maintain the project reservoir at a normal maximum operating level of 98.5 feet mean sea level (msl). The Licensee may periodically cycle generation, fluctuating the reservoir surface elevation between 98.5 feet and 97 feet msl. When refilling the reservoir after a peaking event, the Licensee shall discharge a total flow from the project of at least 1,700 cfs or inflow, whichever is less. This discharge shall include the required minimum flow to the bypass reach and any flows through the project's fish passage facilities.
- Normal operation may be temporarily modified, if required by operating emergencies beyond the control of the Licensee, and for short periods upon mutual agreement between the Licensee and the MIFW.
- MDEP's water quality standards identify that reservoirs of hydroelectric projects may impact DO levels and water temperature by retaining water long enough to stratify. A stratified reservoir with a deep-water release may discharge flows low in DO; a stratified reservoir that discharges from its higher elevations may release water with relatively high temperatures. Water quality monitoring conducted from 1990 to 1994 determined that project operation has not affected DO levels in the river below the project dam. Sampling during low flow, high temperature periods revealed that DO levels there are frequently at saturation or supersaturation, well above the required Class C standard (Appendix C).
- MDEP's Biological Monitoring Program, conducted an Aquatic Life Classification Attainment in 2010 at station Number S-956, located above Pejepscot Dam, which is approximately 3.4 miles downstream of the Worumbo Project. The final determination continues to verify that the waters below the Worumbo Project are Class C (http://www.maine.gov/dep/gis/datamaps/lawb_biomonitoring/reports/log_1978.pdf).

3.7 UPSTREAM FISH PASSAGE STANDARDS: IMPOUNDMENT ZOE

CRITERION	STANDARD	INSTRUCTIONS		
С	1	Not Applicable / De Minimis Effect:		
		• Explain why the facility does not impose a barrier to upstream fish		
		passage in the designated zone.		
		• 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.		

- The project is located on the Androscoggin River in Maine, within designated critical habitat for the endangered Gulf of Maine (GOM) Distinct Population Segment of Atlantic salmon.
- The project does not create a barrier for migratory upstream fish passage, because there is an existing upstream fish passage facility (See Section 3.8) (Photograph 4 of Appendix B). The facility has upstream passage facilities for migratory species, including eels, based upon agency recommendations. Monitoring and operations of the fish passage facilities occurs annually, including provision of an annual report and associated meeting with resource agencies.
- Upon exiting fish passage facilities into the impoundment, the project impoundment creates no barrier to upstream fish movements.
- On May 14, 2012, the Licensee filed an Interim Species Protection Plan (Interim SPP) describing measures it would take in the years 2013 through 2016 to avoid and minimize impacts to federally-listed endangered Atlantic salmon during operation of the Worumbo Project. The Licensee also filed a plan for study of upstream and downstream passage of Atlantic salmon on December 19, 2012, pursuant to the Interim SPP. On July 6, 2016, the Licensee filed its draft Final SPP.
- FERC submitted the Notice of Application for Amendment of License to Incorporate Final Fish Passage Plans on October 5, 2016²³, which Brown Bear Hydro, requested that the Commission amend the project license to incorporate its proposed species protection plan for Atlantic salmon.
 - FERC requested formal consultation on October 14, 2016, between NOAA and USFWS²⁴, with the Species Protection Plan and Draft Biological Assessment²⁵.
- Formal Consultation under Section 7(a)(2) of the Endangered Species Act, was completed and a Biological Opinion and Incidental Take Statement²⁶ was ordered on April 3, 2017 by NOAA. FERC amended the license to incorporate the SPP and BO, with limited exceptions, on May 11, 2018²⁷. The Licensee is currently seeking rehearing to make minor safety related modifications to the timing requirements of three of the conditions of the BO.

²³ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14370341

²⁴ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14376100

²⁵ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14298009

²⁶ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14546230

²⁷ <u>https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14915277</u>

- The project impoundment supports populations of largemouth bass, smallmouth bass, pickerel, yellow perch, and assorted non-game species, including white sucker and spottail shiner.
- According to the Environmental Assessment²⁸, Maine IFW and the USFWS indicate that the 1.5-foot headpond elevation change, and periodic fluctuation within that range, would not affect the quantity of adult habitat nor the spawning success of warmwater species in the reservoir.

²⁸ <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3132046</u>

3.8 UPSTREAM FISH PASSAGE STANDARDS: BYPASSED REACH ZOE

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.

- The upstream fish passage was constructed in 1988, which consists of a vertical lift system with two entrance gates, a connecting gallery, four attraction water pumps, a mechanically operated fish crowder, a cable-operated fish lift, and upper level canal, a fish counting room, and an automatic control system. The project passage facilities pass migratory species, including eels, based upon agency recommendations.
- Article 35 of the 1985 FERC license pertains to fish passage and future study activities at the Project. The article specifies:
 - No additional upstream or downstream fish passage studies are recommended at this time. Future studies, if any, may be determined in consultation with the resource agencies as alewife or other target populations become more abundant, as the evaluation of additional modifications may be indicated, or as additional methods and technologies appropriate to the site become available.
 - Upstream and downstream fish passage facilities are to be operated in a manner and on a schedule determined in consultation with the resource agencies.
 - The Licensee meets with the resource agencies annually to discuss the status of anadromous fish runs in the Androscoggin River and the need for further passage studies.
 - 0
- On May 14, 2012, Licensee filed an Interim Species Protection Plan (Interim SPP) describing measures it would take in the years 2013 through 2016 to avoid and minimize impacts to federally-listed endangered Atlantic salmon during operation of the Worumbo Project. The Licensee also filed a plan for study of upstream and downstream passage of Atlantic salmon. The Licensee shall determine the schedule for the annual operation of the project's new spillway gates for downstream passage of Atlantic salmon smolts, and operation of the new adjustable weir for upstream passage of American eel. On July 6, 2016, the Licensee filed its Final SPP²⁹.

²⁹ https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14298007

• Annual status reports have been filed with the Commission following the annual meetings with the resource agencies. The Licensee conducted an Atlantic salmon passage study in 2013 and submitted a report in March 2014 (noted below). Subsequent study efforts consisted of telemetry monitoring for which count data was reported in subsequent annual fish passage status reports.

FERC Approved Fish Passage Status Reports

- o July 11, 2014³⁰
- o October 20, 2015³¹
- o July 27, 2017^{32} (reports on 2015 and 2016 seasons)

Atlantic Salmon Passage Study Reports

- o March 31, 2014³³
- FERC submitted the Notice of Application for Amendment of License to Incorporate Final Fish Passage Plans on October 5, 2016³⁴, which Brown Bear Hydro, requested that the Commission amend the project license to incorporate the Biological Opinion and its proposed SPP for Atlantic salmon.
- FERC requested formal consultation on October 14, 2016, between NOAA and USFWS³⁵, with the SPP and Draft Biological Assessment.
- Formal Consultation under Section 7(a)(2) of the Endangered Species Act, was completed and a Biological Opinion and Incidental Take Statement³⁶ was issued by NOAA on April 3, 2017. FERC amended the license to incorporate the SPP and BO on May 11, 2018³⁷(Appendix G), with the exception of measures that require mapping of Atlantic salmon habitat and migration barriers in the Little River.
- Brown Bear Hydro agrees with the SPP measures approved by FERC's order approving amendment of the license to incorporate those measures including Atlantic salmon smolt survival studies and conduct of upstream and downstream adult Atlantic salmon passage monitoring studies the following year (i.e., in the third year following two years of at least 40 adult returns). Brown Bear Hydro has implemented the upstream and downstream fish passage operations parameters, in consultation with agencies. Brown Bear Hydro does not have any differing positions on Atlantic salmon recovery or the requirements of the SPP. Brown Bear has requested rehearing on the FERC order seeking minor safety related timing modifications for three of the ten conditions of the BO.

3.9 UPSTREAM FISH PASSAGE STANDARDS: DOWNSTREAM ZOE

CRITERION STANDARD INSTRUCTIONS

³⁰ <u>https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=13595524</u>

³¹ <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14019028</u>

³² https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14644715

³³ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13495937

³⁴ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14370341

³⁵ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14376100

³⁶ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14546230

³⁷ https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14915277

С	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.

• Please see answer to Impoundment ZOE above - the project commonly is operated as a run-of river project such that outflow equals inflow, having no adverse effect on fish or habitat downstream of the project. When the impoundment is refilled after a peaking operation, 1,700 cfs is provided downstream, during this process downstream habitat conditions and zone of passage are consistent with agency recommendations as addressed in the WQC (Appendix C) and Article 30³⁸, of the amended license.

Under the SPP, the Licensee will operate the Worumbo upstream fishway from May 1 to November 15 from 9:00 am to 5:00 pm, river conditions permitting, or if an alternative date is approved by MDMR, USFWS, and NMFS.

• Please see answers to Impoundment and Bypass Reach ZOE above regarding the May FERC order amending the license to incorporate the SPP, the Licensee's June request for clarification/rehearing. Additionally reference Impoundment and Bypass Reach ZOE regarding FERC approved Fish Passage Reports and Atlantic Salmon Passage Study Reports

Upstream eel passage was completed for the Project in 2012 (Photo 2). The passage system is installed annually upon recession of high flows in the spring and operated until August 31 each year, in consultation with MDMR (Photo 1). Brown Bear Hydro monitors the holding tank during this period and eels captured are regularly counted, measured by estimating their lengths only and released into the impoundment. Eel monitoring results are included in the annual fish passage reports.

³⁸ <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3132044</u>







PHOTO 2 EEL PASSAGE DESIGN DRAWING
3.10 DOWNSTREAM FISH PASSAGE STANDARDS: IMPOUNDMENT ZOE

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 part of a Settlement Agreement or not. Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

- The project is located on the Androscoggin River in Maine, within designated critical habitat for the endangered Gulf of Maine (GOM) Distinct Population Segment of Atlantic salmon.
- The project's downstream fish passage facilities include three entrance gates (only one is used based on a study conducted in consultation with agencies in 1999) with trashracks (12-inch clear spacing) located at the surface of head pond 11.30 feet above the top of the turbine intakes, sectional gates to close individual entrances, a collection gallery between the entrances, a 36-inch-diameter plastic transfer pipe, and a stop log-controlled plunge pool that measures 30-feet by 20 feet and is kept at a depth of 10-feet under normal operating conditions.
- The Worumbo downstream fishway consists of three inlet systems located on the upstream face of the inlet deck area staring at elevation 93.0 to 101.0 feet by 36 inches wide. Each inlet consists of the following items:
 - o six inlet stop log gates;
 - o two 36" wide by 12" tall:
 - o two 36" wide by 18" tall; and
 - o two 36" wide by 24" tall.
- A set of trash racks is mounted just inside the upstream opening. Each inlet area then channels the water/fish into a 36-inch diameter pipe to which all three downstream inlets are connected. This pipe then discharged the water/fish into a plunge pool area located on the river side of the station just below the fish viewing room. The water inside the plunge pool then exists by way of a weir gate. This weir gate is adjusted to maintain the water level inside the plunge pool area above the 36-inch discharge pipe opening.
- Article 35 of the 1985 License required the Licensee to conduct annual fish passage effectiveness studies to meet with resource agencies annually to discuss the status of anadromous fish runs in the Androscoggin River and file annual status reports with

FERC following these meetings. A plan for future fish studies was filed on September 24, 1998. On November 12, 1998, FERC approved the fish studies³⁹.

- Please refer to Upstream Passage Impoundment and Bypass ZOE responses for summary of SPP and BO conditions and historical reporting for fish passage.
- Objectives of the 2013 studies were to evaluate the route of passage and survival of smolts at the Worumbo Project and to monitor adult Atlantic salmon passage, evaluating the success rate of upstream passage at the Project. Smolts were radio-tagged and used to show the migration pattern over the dam. A total of 102 radio-tagged smolts represented the treatment group, while 47 smolts represented the control group. In addition to these 149 smolts, an additional 10 smolts were used for the tag/life retention study. The downstream passage routes available to treatment smolts during the study included over the spillway, through the downstream fish bypass, or through the turbines. A total of 52 treatment fish were detected as passing through the Project. The most (n=20) treatment smolts passed the Project over the spillway, while 19 were detected passing through the turbines, and 13 through the downstream bypass facility. These data suggest the combination of the notched spillway and bypass facility is effective in passing most smolts (62%) downstream without turbine exposure, even in a low-flow year. Two adult Atlantic salmon were observed at the Worumbo Project.

In 2015 studies were conducted to look at downstream salmon smolt passage utilizing radio telemetry methods and monitored predation. This study continued the effort initiated in 2014 to evaluate varying floodgate releases as a potential protection measure for consideration in the subsequent SPP. This was the third and final year of passage evaluation conducted as specified under the Interim SPP. Upstream passage of adult Atlantic salmon was not monitored in 2015 since the MDMR did not continue their efforts to radio tag adult salmon collected at the Brunswick Fishway.

- FERC requested formal consultation on October 14, 2016, between NOAA and USFWS⁴⁰, with the Species Protection Plan and Draft Biological Assessment⁴¹.
- Formal Consultation under Section 7(a)(2) of the Endangered Species Act, was completed and a Biological Opinion and Incidental Take Statement⁴² was issued on April 3, 2017.
- FERC issued the Notice of Application for Amendment of License to Incorporate Final Fish Passage Plans on October 5, 2016⁴³, in response to Brown Bear Hydro's request that the Commission amend the project license to incorporate its proposed species protection plan for Atlantic salmon. FERC issued an Order amending license to incorporate the terms of the SPP, with the exception of requirements for mapping of Atlantic salmon habitat and migration barriers in the Little River, on May 11, 2018⁴⁴.
- Downstream Atlantic salmon smolt studies were conducted from 2013-2015, described above. These studies provided site-specific information to evaluate whole station survival

³⁹ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10817404

⁴⁰ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14376100

⁴¹ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14298009

⁴² <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14546230</u>

⁴³ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14370341

⁴⁴ <u>https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14915277</u>

and assist in developing additional measures to increase downstream passage survival. These studies showed that smolts passed through the floodgate and at a higher rate when the floodgate was at its lowest flow discharge setting. Therefore, Brown Bear Hydro proposed to operate the floodgate at its lowest setting as an additional passage route nightly between May 7 and May 21 of each year. This represents a significant increase in non-turbine flow, reducing generation. Combined with bypass flow (300 cfs), this proposal allows for an expected passage flow of 800 cfs. However, Brown Bear Hydro proposed that this measure will only be implemented if it is known that at least two adult Atlantic salmon were passed upstream two years prior (and thus may have successfully spawned and produced out-migrating smolts), or if an Atlantic salmon stocking program is established upstream of the Project. As of the 2017 season, no adult Atlantic salmon were observed or passed upstream by the Worumbo upstream fish lift.

- Under the SPP, the Licensee will operate the Worumbo downstream fishway from April 1 to December 31 each year, river conditions (i.e., ice) permitting. This will ensure that the Worumbo Project fishway is open when anadromous species may be present near the Project. The Licensee will coordinate with the NMFS and MDMR prior to modifying the fishway operational dates.
- Brown Bear Hydro has proposed to conduct a smolt survival study in 2025 to verify that the standard is being met, and to monitor "take" at the project. Additionally, if the standard is not achieved, Brown Bear Hydro "...will evaluate additional measures designed to direct migrating salmon to the most effective passage routes, and will then monitor passage survival again the year following...". However, as the study was proposed for the final year of the SPP, NMFS assumes that this additional study year, if it is necessary, would occur under the term of the next license, presumably under a new SPP, which is not being considered under the 2017 Biological Opinion.
- The project is not currently required to have a specific downstream eel passage facility.

3.11 DOWNSTREAM FISH PASSAGE STANDARDS: BYPASSED REACH

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 part of a Settlement Agreement or not. Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented

- Please see answer to Impoundment ZOE above, which describes downstream fish passage measures for the project. The project's downstream fish passage facilities include three entrance way gates (only one is uses at this time), and include a 36-inch-diameter plastic transfer pipe that discharges into the plunge pool within the bypass reach.
- Downstream fishway flows range from a minimum 119 cfs to 131 cfs under controlled pond conditions, the plunge pool is equipped with two sectional gates that may be manipulated to control the depth of the water in the plunge pool.
- The Bypassed Reach has three different habitat sections for residential fish species refuge. Recommended by agencies, three pool areas were created to aid in essential species activities, such as feeding, resting and reproduction.

3.12 DOWNSTREAM FISH PASSAGE STANDARDS: DOWNSTREAM ZOE

CRITERION	STANDARD	INSTRUCTIONS
D	1	Not Applicable / De Minimis Effect:
		• Explain why the facility does not impose a barrier to
		downstream fish passage in the designated zone, considering
		both physical obstruction and increased mortality relative to
		natural downstream movement (e.g., entrainment into
		hydropower turbines).
		• For riverine fish populations that are known to move
		downstream, explain why the facility does not contribute
		adversely to the sustainability of these populations or to their
		access to habitat necessary for successful completion of their
		life cycles.
		• 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.

• Please see answer to Impoundment and Bypass ZOE above, which describes downstream fish passage measures for the project. There are no barriers to downstream fish passage in the Downstream ZOE. Please see Section 3.10 (Impoundment ZOE).

3.13 SHORELINE AND WATERSHED PROTECTION STANDARDS: IMPOUNDMENT, BYPASSED REACH, AND DOWNSTREAM ZOES

CRITERION	STANDARD	INSTRUCTIONS
Е	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.

- Standard Article 19 (Form L-4, Revised October 1975) requires the Licensee to take reasonable measures to control sedimentation and other pollution at the project.
- The existing shoreline is relatively steep and rocky with stable soils. As part of the amended license in 1998, a shoreline monitoring program (SMP) was conducted after consultation with the MDEP and the USFWS to investigate potential erosion of the reservoir shoreline due to the new proposed operating regime (i.e. allowing the reservoir to fluctuate between elevation 98.5 and 97 ft.).
- According to FERC's order approving the headpond erosion survey, the report documents that the entire shoreline was surveyed. Few changes from the baseline survey were observed at sites that were previously documented. Because of higher water levels during this survey, more sites were available for viewing and sites where erosion was observed were recorded. Photographs of areas of interest identified during the baseline survey and new sites of concern were included in the filing. The USFWS accepted the report in a letter dated November 1, 1999. The MDEP accepted the report via personal communication on October 13, 1999.
 - Initial headpond erosion survey ⁴⁵
 - Order approving Final Headpond Erosion Survey ⁴⁶
- No license article, settlement agreement or shoreline management plan requires that a buffer zone be dedicated for conservation purposes or that a watershed enhancement fund is required. As noted above, agencies accepted results of erosion surveys at the project, which was the only shoreline related issues identified in the prior license proceeding.
- The area surrounding the three ZOEs consists of hilly, rural residential area of Southwestern Maine that includes scattered farms and commercial establishments. Land cover units, with non-significant ecological value (i.e., no State or municipally designated areas), identified in the vicinity of the project can be found in Table 2 (based on National Land Cover Database 2011: <u>http://www.mrlc.gov/nlcd11_leg.php</u>).

⁴⁵ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10846113

⁴⁶ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=6012315

TABLE 3 PROJECT LAND COVER CLASSIFICATION

CLASS/VALUE	CLASSIFICATION DESCRIPTION
11	Open Water- areas of open water, generally with less than 25% cover of vegetation or soil.
21	Developed, Open Space- areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
22	Developed, Low Intensity- areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.
23	Developed, Medium Intensity -areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.
31	Barren Land (Rock/Sand/Clay) - areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.
41	Deciduous Forest- areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.
42	Evergreen Forest- areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.
43	cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.
52	Shrub/Scrub- areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.
71	Grassland/Herbaceous- areas dominated by gramanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.

CLASS/VALUE	CLASSIFICATION DESCRIPTION		
	Cultivated Crops -areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton,		
	and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total		
82	vegetation. This class also includes all land being actively tilled.		
	Woody Wetlands- areas where forest or shrubland vegetation accounts for greater than 20% of vegetative cover and the		
90	soil or substrate is periodically saturated with or covered with water.		
	Emergent Herbaceous Wetlands- Areas where perennial herbaceous vegetation accounts for greater than 80% of		
95	vegetative cover and the soil or substrate is periodically saturated with or covered with water.		

3.14 THREATENED AND ENDANGERED SPECIES STANDARDS: IMPOUNDMENT, BYPASSED REACH, DOWNSTREAM ZOE

CRITERION	STANDARD	INSTRUCTIONS
F	3	Recovery Planning and Action:
		• If listed species are present, document that the facility is in
		compliance with relevant conditions in the species recovery
		plans, incidental take permits or statements, biological
		opinions, habitat conservation plans, or similar government
		documents.
		• Document that any incidental take permits and/or biological
		opinions currently in effect were designed as long-term
		solutions for protection of listed species in the area.

- The project is located on the Androscoggin River in Maine, within designated critical habitat for the endangered Gulf of Maine (GOM) Distinct Population Segment of Atlantic salmon.
- Formal consultation as required by Section 7 of the Endangered Species Act (ESA), was requested by FERC on October 14, 2016 between the NMFS and the USFWS⁴⁷, at the time that a Biological Assessment (BA) concerning the Final Species Protection Plan (Final SPP) was submitted⁴⁸.
- Under the FERC approval of the BO and SPP through license amendment (issued May 11, 2018), the Licensee would take additional measures to study, protect and enhance Atlantic salmon in the Androscoggin River, pending response by FERC to June request by Licensee for clarification on FERC approval of the BO and SPP. These measures include making improvements in operation and timing of upstream and downstream fish passage, conducting fish passage studies, monitoring bird predation during downstream passage, incorporating adaptive management, and providing annual reports. Brown Bear Hydro has implemented the upstream and downstream fish passage operations parameters, in consultation with agencies.
- Based on the analysis in the BA, FERC concluded that operation of the Worumbo Project, including the measures described in the Final SPP, may adversely affect a small number of individual GOM Atlantic salmon, but would not be likely to adversely modify or destroy critical habitat. FERC asked NFMS and USFWS to provide their BO no later than 135 days from the receipt of the request for formal consultation. NFMS responded on February 1, 2017, stating that they had received the request and a Biological Opinion would be delivered on or before March 24, 2017⁴⁹.
- On April 3, 2017, NMFS submitted the Biological Opinion for the Worumbo Project, which included the proposed amendment to the project license to incorporate the provisions of a SPP until the issuance of a new license on December 1, 2025⁵⁰. They concluded that the continued operation of the project consistent with the terms of the SPP may adversely affect but is not likely to jeopardize the continued existence of the Gulf of Maine Distinct Population Segment of Atlantic salmon. Although ongoing operations of the hydroelectric

⁴⁷ <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14376100</u>

⁴⁸ http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14298009

⁴⁹ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14532006

⁵⁰ <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14546230</u>

facility will continue to adversely affect essential features of this habitat, the proposed action is anticipated to improve the functioning of critical habitat in the Androscoggin River. In the BO, the NMFS concluded that the proposed action will not result in adverse modification or destruction of critical habitat.

- As required by section 7(b)(4) of the ESA, the BO includes an incidental take statement (ITS). The ITS exempts a certain amount of incidental take of Atlantic salmon from activities associated with the ongoing operation of the hydroelectric facility as well as upstream and downstream passage and survival studies, this number is 63 Atlantic salmon over a nine-year period.
- Fish Monitoring required by the BO is as follows:

To assess the present level of upstream and downstream survival of adult Atlantic salmon, the Licensee will tag up to 40 adults, installing telemetry receivers around the Project, at the mouth of Little River, and at locations downstream of the Project (if/when sufficient numbers of adults are passed at the Brunswick Project, see Section 3.8 for more information).

The Licensee will use up to 200 hatchery smolts for one year of study (two years after each year when two or more adult sea-run Atlantic salmon have passed upstream of the Project).

- The ITS also specifies Reasonable and Prudent Measures (RPMs) and implementing Terms and Conditions necessary to minimize the impact of these activities on Atlantic salmon. The RPMs and Term and Conditions are in addition to the measures contained in the October 14, 2016, SPP. FERC must implement the following for RPMs:
 - FERC must ensure, through enforceable conditions of the Project license, that the Licensee measure and monitor the provisions contained in the October 14, 2016 Species Protection Plan in a way that is adequately protective of listed Atlantic salmon.
 - FERC must ensure, through enforceable conditions of the Project licenses, that the Licensee complete an annual monitoring and reporting program to confirm that they are minimizing incidental take and reporting all project-related observations of dead or injured salmon to NFMS.
- For a list of the Terms and Conditions please see the BO for here: <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14546230</u>
- FERC amended the License on May 11, 2018⁵¹ to adopt the terms of the BO and SPP, with the exception of habitat mapping in the Little River The licensee will implement the measures, pending response by FERC to June request by Licensee for clarification on FERC approval of the BO and SPP.
- Based on an official USFWS List (IPaC Receipt) populated on October 29, 2017 (Appendix D), in addition to the federally endangered Atlantic salmon, the federally threatened Northern long-eared bat (*Myotis septentrionalis*) may occur within the Project Vicinity. In addition, the bald eagle which was de-listed and removed from the federal list of endangered and threatened species in 2007, is considered a potential transient species only.
- On November 13, 2017, a request was made to Maine Natural Area Program (MNAP) requesting information regarding State of Maine listed rare or special status species or habitat

⁵¹ <u>https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=14915277</u>

that may occur within the project area. MNAP replied on November 14, 2017, that there are no rare botanical features documented specifically within the project area (Appendix D).

• On December 4, 2017, a request was made to MIFW requesting information regarding State of Maine listed rare, threatened, endangered or special status species or habitat that may occur within the project area (Appendix D).

Sea run alewife	Landlocked salmon
American eel	Largemouth bass
American shad	Longnose dace
Atlantic salmon	Longnose sucker
Black crappie	Northern pike
Bluegill sunfish	Pumpkinseed sunfish
Brook trout	Rainbow trout
Brown bullhead	Red breast sunfish
Brown trout	Rock bass
Burbot	Sea lamprey
Chain pickerel	Slimy sculpin
Common carp	Smallmouth bass
Common shiner	Spottail shiner
Creek chub	Striped bass
Banded killifish	White catfish
Blacknose dace	White perch
Fallfish	White sucker
Four spine stickleback	Yellow perch
Golden shiner	Tessellated darter
Lake chub	

• The following are fish assemblage documented in the Androscoggin River drainage:

• For known rare, threatened and endangered wildlife species that may occur in the project area during migration and or breeding season are:

Little brown bat (State Endangered)		
Northern long-eared bat (State		
Endangered)		
Eastern small-footed bat (State		
Threatened)		
Big brown bat (Special Concern)		
Red bat (Special Concern)		
Hoary bat (Special Concern)		
Silver-haired bat (Special Concern)		
Tri-colored bat (Special Concern)		

- One mussel species was identified that may occur in the project area:
 - Creeper (special concern mussel)

- MIFW databases do not indicate the presence of other State-listed Endangered, Threatened, or Special Concern Species in the Project area; however, MIFW indicates that no known formal surveys have been conducted and therefore it is possible (likely) that other rare species may be resident or transient at the Project area based on location, habitats present, and life history requirements. It is also possible that one or more rare species of migratory birds may be found in the area during spring and fall migrations. Therefore, the list above should not be considered all-inclusive.
 - MIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of SWHs within the project area, which include Waterfowl and Wading Bird Habitats, Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed so it is possible that this habitat could occur within the project area.

3.15 CULTURAL AND HISTORIC RESOURCES STANDARDS: IMPOUNDMENT, BYPASSED REACH, AND DOWNSTREAM ZOES

CRITERION	STANDARD	INSTRUCTIONS
G	1	Not Applicable / De Minimis Effect:
		• Document that there are no cultural or historic resources
		located on facility lands that can be affected by construction or
		operations of the facility.
		• Document that the facility construction and operation have not
		in the past adversely affected any cultural or historic resources
		that are present on facility lands.

- Article 36 requires the Licensee to consult with the SHPO in the event any resources of historical or archaeological significance are found.
- On April 17, 1998, the Maine Historic Preservation Commission (MHPO) stated after reviewing the proposed amendment to license, "Although there are or may be properties in the project area of historic, architectural, or archaeological significance as defined by the National Historic Preservation Act of 1966, we find that the proposed undertaking will have no effect upon such properties, in that the proposed pool operation between 98.5 and 97.0 feet, which is less than the historic operating maximum of 99.0 feet, will not exacerbate erosion of any archaeological sites located above the pool elevation." No other cultural Resources issues were found (Appendix F).
- The Worumbo Mill was listed in the National Register of Historic Places (NRHP); after a fire in 1987 destroyed the building, it was removed from the list. There are no other known sites in the project area that are listed or eligible for listing in the NRHP.

3.16 RECREATIONAL RESOURCES STANDARDS: IMPOUNDMENT ZOE

CRITERION	STANDARD	INSTRUCTIONS
Н	2	Agency Recommendation:
		 Document any comprehensive resource agency
		recommendations and enforceable recreation plan that is in
		place for recreational access or accommodations.
		• Document that the facility is in compliance with all such
		recommendations and plans.

- Article 37 of the 1985 License requires the Licensee to construct a boat launch in the Town of Lisbon and a canoe portage at the project. A plan for this was submitted on August 19, 2013, and approved on October 9, 2013 (Environmental Inspection 2016). In response to this Article, the Licensee constructed a boat ramp with adjacent parking and picnic areas at the upstream end of the project reservoir in 1987. Subsequently, the Licensee transferred these facilities to the Town of Lisbon.
- The project provides recreational access relative to the size of project lands and waters. There is a canoe takeout located on the left side (looking downstream) of the reservoir that has a floating dock for ingress/egress, signage and fencing at canoe facility, boat barrier, and warning signs at the dam in the Impoundment ZOE (Photograph 1 and 2 of Appendix B, and Figure 8 of Appendix A).
- The Licensee, as part of their Public Safety Plan (Appendix H), provides multiple warning signs, strobe lights, and siren to alert the public and employees in case of any station forced and/or trip event that would cause an increase in spillage over the dam.
- The Public Safety Plan, is reviewed and updated (when necessary) annually. The Public Safety Plan is intended to provide notification procedures that will alert the proper personnel and organizations so that properly trained personnel can effectively support public safety.
- Prior to the raising of the impoundment elevation, that was approved by FERC in the 1998 amendment, boaters on the Sabattus River traveling to the Androscoggin River passed under a railroad bridge that provided an under clearance of approximately 7 feet. With the higher reservoir elevations after the 1998 FERC amendment, clearance under the railroad bridge was reduced to 5.5 feet. The Licensee concludes that this amount would be adequate for public safety⁵². The agencies concur with this assessment.
 - During periods of very high river flows, clearance could be reduced even further. To warn boaters of the potential danger at the railroad bridge, the Licensee proposed to post a warning sign at the Town of Lisbon's existing boat launch on the Sabattus River⁵³.
 - FERC agreed that placing a sign at the Town's boat launch represented an appropriate precautionary measure. In addition, FERC concluded that there was a need for signage at the railroad bridge to warn boaters of the reduced (5.5-foot) clearance during normal river flows. This signage was installed in the 1990s and is maintained

⁵² <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3132044</u>

⁵³ https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3132044

as needed. Warning signs at both the Town's boat launch and at the railroad bridge, were required to be installed prior to increasing the reservoir elevation⁵⁴.

• Within FERC's 2016 Environmental Inspection Report⁵⁵ it was concluded that the Project is in compliance with requirements in regard to recreational resources.

 ⁵⁴ <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3132044</u>
 ⁵⁵ <u>https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14445769</u>

3.17 RECREATIONAL RESOURCES STANDARDS: BYPASSED REACH ZOE

CRITERION	STANDARD	INSTRUCTIONS
Н	1	Not Applicable / De Minimis Effect:
		• Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area

- There is no facility owned recreational resources within the bypassed reach, however, fishing is permitted. Please see the Impoundment and Downstream ZOE for additional information on recreation.
- The Licensee cannot restrict fishing within the bypassed reach of the facility; therefore, the Licensee, as part of their Public Safety Plan (Appendix H), provides multiple warning signs, strobe lights, and a siren to alert the public and employees in case of any station forced and/or trip event that would cause an increase in spillage over the dam.
- The Public Safety Plan, is reviewed and updated (when necessary) annually. The Public Safety Plan is intended to provide notification procedures that will alert the proper personnel and organizations so that properly trained personnel can effectively support public safety.

3.18 RECREATIONAL RESOURCES STANDARDS: DOWNSTREAM ZOE

CRITERION	STANDARD	INSTRUCTIONS
Н	2	Agency Recommendation:
		• Document any comprehensive resource agency
		recommendations and enforceable recreation plan that is in
		place for recreational access or accommodations.
		• Document that the facility is in compliance with all such
		recommendations and plans.

- The project provides appropriate recreational access relative to the size of project lands and waters. Angler access with parking is provided downstream of the project (Photograph 3 of Appendix B), with parking across the street from the project. A downstream fishing access trail (Photograph 11 of Appendix B) leads to a fishing area on the left bank of the river, looking downstream, (Photograph 12 of Appendix B). There is perimeter fencing and Part 12 signs (Photograph 10 of Appendix B) before reaching the parking area. (Please see Figure 8 of Appendix A for an overview of the recreational facilities)
- The Licensee, as part of their Public Safety Plan (Appendix H), provides multiple warning signs, strobe lights, and siren to alert the public and employees in case of any station forced and/or trip event that would cause an increase in spillage over the dam.
- The Public Safety Plan, is reviewed and updated (when necessary) annually. The Public Safety Plan is intended to provide notification procedures that will alert the proper personnel and organizations so that properly trained personnel can effectively support public safety.
- Downstream of the project dam on the Lisbon side of the river, the Licensee for the downstream Pejepscot Project, in cooperation with the Licensee for the Worumbo Project, constructed a bank fishing access site in 1992⁵⁶. Some recreational fishing also occurs on the Durham side of the river.
- Within the 2016 Environmental Inspection Report, it was concluded that the Project appears to be in compliance with requirements in regard to recreational resources.

⁵⁶ https://elibrary-backup.ferc.gov/idmws/common/opennat.asp?fileID=3459351

4.0 CONTACTS FORMS

Project Owner:				
Name and	Robert Gates, Vice President			
Title				
Company	Brown Bear II Hydro Inc.			
Phone	(973) 998-8403			
Email Address	bob.gates@eaglecreekre.com			
Mailing	65 Madison Avenue, Suite 500. Morristown, New Jersev 07960			
Address				
Consulting Firm	A / Agent for LIHI Program (if different from above):			
Name and	Andy Qua and Kayla Easler			
Title				
Company	Kleinschmidt Associates			
Phone	(207) 487-3328			
Email Address	Andrew.Qua@KleinschmidtGroup.com,			
	Kayla.EaslerSellers@KleinschmidtGroup.com			
Mailing	P.O. Box 650, Pittsfield, Maine 04967			
Address				
Compliance Contact (responsible for LIHI Program requirements):				
Name and	Robert Gates, Vice President, Brown Bear II Hydro, Inc.			
Title				
Company	Brown Bear II Hydro Inc.			
Phone	(973) 998-8403			
Email Address	bob.gates@eaglecreekre.com			
Mailing	65 Madison Avenue Suite 500, Morristown, New Jersey 07960			
Address				
Party responsibl	e for accounts payable:			
Name and	Robert Gates, Vice President			
Title				
Company	Brown Bear II Hydro Inc.			
Phone	(973) 998-8403			
Email Address	bob.gates@eaglecreekre.com			
Mailing	65 Madison Avenue, Suite500, Morristown, New Jersey 07960			
Address				
Agency Contact	(Check area of responsibility: Flows \Box , Water Quality \Box , Fish/Wildlife			
Resources \Box . Wa	atersheds \boxtimes , T/E Spp. \square , Cultural/Historic Resources \square , Recreation \square):			
Agency Name	State of Maine Department of Agriculture, Conservation & Forestry - Maine			
rigeney runne	Natural Areas Program			
Name and Title	Kristen Purvear Ecologist			
Phone Phone	207-287-8043			
Email address	Kristen nurvear@maine gov			
Mailing	93 State House Station			
Address	Augusta Maine 04333			
11001055				

Agency Contact (Check area of responsibility: Flows□, Water Quality ⊠, Fish/Wildlife						
Resources \Box , Wa	Resources \Box , Watersheds \boxtimes , T/E Spp. \Box , Cultural/Historic Resources \Box , Recreation \Box):					
Agency Name	U.S. Fish and Wildlife Service					
Name and Title	IPaC generated list					
Phone	207-469-7300					
Email address	https://www.fws.gov/mainefieldoffice/index.html					
Mailing	Maine Ecological Services Field Office					
Address	P.O. Box A					
	East Orland, Maine 04431					
Agency Contact	(Check area of responsibility: Flows \boxtimes , Water Quality \Box , Fish/Wildlife					
Resources 🖾, Wa	atersheds \boxtimes , T/E Spp. \boxtimes , Cultural/Historic Resources \Box , Recreation \boxtimes):					
Agency Name	Maine Department of Inland Fisheries and Wildlife					
Name and Title	James Pellerin, regional Biologist					
Phone	(207) 657-2345					
Email address	James.Pellerin@maine.gov					
Mailing	RR1, 358 Shaker Road					
Address	Gray, ME 04039					
Agency Contact	(Check area of responsibility: Flows \Box , Water Quality \Box , Fish/Wildlife					
Resources ⊠, Wa	atersheds \Box , T/E Spp. \Box , Cultural/Historic Resources \Box , Recreation \Box):					
Agency Name	Maine Department of Marine Resources					
Name and Title	Gail Wippelhauser, Biologist					
Phone	(207) 624-6349					
Email address	gail.wippelhauser@maine.gov					
Mailing	21 State House Station					
Address	Augusta, ME 04333					
Agency Contact (Check area of responsibility: Flows⊠, Water Quality ⊠, Fish/Wildlife						
Resources \Box , Watersheds \Box , T/E Spp. \Box , Cultural/Historic Resources \Box , Recreation \Box):						
Agency Name	Maine Department of Environmental Protection					
Name and Title	Kathy Howatt					
Phone	207-446-2642					
Email address	kathy.howatt@maine.gov					
Mailing	Maine Department of Environmental Protection					
Address	Bureau of Land and Water Quality					
	17 State House Station					
	Augusta, ME 04333					

Sworn Statement and Waiver Form

All applications for LIHI Certification must include the following sworn statement before they can be reviewed by LIHI:

SWORN STATEMENT

As an Authorized Representative of Brown Bear II Hydro Inc., 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 if certification of the applying facility is issued, 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.

PLEASE INSERT ONLY FOR PRE-OPERATIONAL CERTIFICATIONS (See Section 4.5.3):

For applications for pre-operational certification of a "new" facility the applicant must also acknowledge that the Institute may suspend or revoke the certification should the impacts of the project, once operational, fail to comply with the certification criteria.

Company Name: Brown Bear II Hydro Inc._____

Authorize Representative Name: Robert A. Gates_____

Title: EVP		
Authorized Signature:	Haller A. Later	
Date: June 25, 2018_	<u> </u>	

6.0 **REFERENCES**

U.S. Fish and Wildlife Service (USFWS). 2016. National Wetlands Inventory. https://www.fws.gov/wetlands/Data/Mapper.html. Accessed October 4, 2016.

APPENDIX A

PROJECT ZOE AND DRAWINGS



FIGURE 3 OVERVIEW OF PROJECT ZONES OF EFFECT



FIGURE 4 OVERVIEW OF WORUMBO HYDROELECTRIC PROJECT



FIGURE 5 DIAGRAM OF THE WORUMBO PROJECT



FIGURE 6 LAND COVER MAP

APPENDIX B

FACILITY AREA RIVER BASIN AND PHOTOGRAPHS



PHOTO 3 ANDROSCOGGIN RIVER BASIN



FIGURE 7 RIVER DAM LOCATIONS



Source: ESRI, Kleinschmidt, Black Bear II Hydro

FIGURE 8 RECREATION SITES



PHOTO 4 VIEW OF CANOE TAKEOUT/LAUNCH DOCK FACILITY LOOKING UPSTREAM.



PHOTO 5 CANOE TAKEOUT/LAUNCH FACILITY SIGNAGE AND FENCING.



PHOTO 6 VIEW OF PARKING AREA FOR FISHING TRAIL ACROSS THE STREET FROM THE PROJECT.



PHOTO 7 VIEW OF UPSTREAM FISH LIFT.



PHOTO 8 VIEW AT DISCHARGE FROM DOWNSTREAM FISH PASSAGE.



PHOTO 9 ONE OF ENTRANCE WEIRS FOR DOWNSTREAM FISH PASSAGE.


PHOTO 10 VIEW OF UPSTREAM WARNING SIGN ON FACE OF DAM.



PHOTO 11 VIEW OF REBUILT SPILLWAY AND BOAT BARRIER IN BACKGROUND.



PHOTO 12 VIEW DOWNSTREAM AT TAILRACE AND TRAINING WALL.



PHOTO 13 MAIN ENTRANCE TO PROJECT, PERIMETER FENCING, PART 8 SIGNS ON EITHER SIDE.



PHOTO 14 DOWNSTREAM FISHING ACCESS TRAIL ALONG LEFT BANK.



PHOTO 15 DOWNSTREAM FISHING AREA ALONG LEFT BANK.

APPENDIX C

WATER QUALITY



PAUL R. LEPAGE GOVERNOR



PAUL MERCER

December 19, 2016

Eagle Creek Renewable Energy/Worumbo Hydroelectric Station Mr. Kenneth Wells 31 Canal Street Lisbon Falls, ME 04252

RE: Eagle Creek RE- Worumbo Hydroelectric Station MEPDES Permit #ME0023469/WDL License #7590 December 15, 2016 '3560' Inspection: Non-Contact Cooling Water Discharges

Dear Ken:

On December 15, 2016, I performed a 3560 inspection of the Eagle Creek RE- Worumbo Hydroelectric Station, ('Eagle Creek Worumbo') to go over the requirements of the discharge license and to review and observe the station areas that could be potential sources for oil and/or grease leakage into the river. During this inspection Mr. Mark Sherbino and Mr. Thomas DeRubertis of Eagle Creek Renewable Energy (representing the newest owners of this facility) were also onsite. It was a pleasure to meet both of them. Thank you all for your assistance during this inspection. Please find a copy of the final inspection report enclosed.

During the inspection we discussed the following:

•There were no changes in the design, operation (flow or temperature of cooling water), or generating capacity of the facility.

•There were no unauthorized discharges of pollutants during this inspection year. There was one spill reported in May 2014 did not cause any oil to be discharged to the river as it was captured by the oil/water separator sump and the AMOS. The spill was caused by an overflow from the AMOS to the tramp oil barrel and both barrels were retrofitted with sensors to prevent any overfills from occurring again.

•Eagle Creek RE staff will be reviewing the BMPs and the SPCC plan and will update as needed. Currently the 2015 BMPs/SPCC Plan contains an Introduction, Facility Description, Spilled Oil Migration and Harmful Effects, Oil Types, Quantities, and Storage; Operations and Maintenance of the Oil/Water Separator; Potential Discharge Volumes and Direction of flow; Spill Prevention; Spill Control Interlocal Agreement and Oil Response Plan and applicable attachments. Attachment D: the non-contact Cooling Water flow diagram was discussed during this

Attachment D; the non-contact Cooling Water flow diagram was discussed during this inspection and it was agreed that it needs some updates/corrections.

AUGUSTA 17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017 (207) 287-7688 FAX: (207) 287-7826

BANGOR 106 Hogan Road, Suite 6 Bangor, Maine 04401 (207) 941-4570 Fax: (207) 941-4584 PORTLAND 312 CANCO ROAD PORTLAND, MAINE 04103 (207) 822-6300 FAX: (207) 822-6303 PRESQUE ISLE 1235 CENTRAL DRIVE, SKYWAY PARK PRESQUE ISLE, MAINE 04769 (207) 764-0477 FAX: (207) 760-3143

web site: www.maine.gov/dep

Letter to Mr. Kenneth Wells, Worumbo Hydroelectric Station, Lisbon Falls, ME December 19, 2016 Page 2 of 2

An updated and signed electronic copy of the BMPs/SWPP document will be sent to the Department once it is completed (via: denise.behr@maine.gov).

•Worumbo staff continues to keep a station log and follow a daily checklist and a monthly maintenance schedule; this may or may not change dependent on the instructions from Eagle Creek RE.

•Any training done by either on-station operator has been noted in the station log. Future training under the direction of Eagle Creek RE is expected to be 50 % online and 50% hands-on participant classes during January-February.

•During the physical inspection of the facility, all areas with potential to release oil and/or grease to the river were inspected and found to be in good shape, with no remnants or any other physical evidence of any oil or grease spillage noted.

Again, thank you all for your time and assistance with this inspection.

If you have any questions or comments about this letter or the enclosed inspection report, please do not hesitate to contact me at (207) 446-1536 or by e-mail at 'denise.behr@maine.gov'.

Sincerely,

Journe

Denise Fournier Behr, Compliance Inspector Division of Water Quality Management Bureau of Water Quality Maine Department of Environmental Protection – Central Maine Office

pc: Mr. Mark A. Sherbino, Plant Manager, Eagle Creek Renewable Energy Mr. James R. Crowley, Compliance Supervisor, MEDEP file

United States Environmental Protection Agency Washington, D.C. 20460 Water Compliance Inspection Report				jdfjlsjfjls		
	Section A: Nation	al Data S	System Coding (i.e., PCS)		· · · · · · ·
Transaction Code NPDE 1 N 2 3 M E 0 0 2 3	S 3 4 6 9 11 12 1	yr/mo/da 6 1 2 Rema	ay Insper 1 5 17 18 arks	ction Type	Inspe 19 S	ctor Fac Type
21 21 21						66
Inspection Work Days Facility Self-Monitor	ring Evaluation Rating	BI	QA		Re	served
67 4 69 70		71	72 N	73 74	75	80
	See	ction B: F	acility Data	I		1
Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number) WORUMBO HYDROELECTRIC DAM STATION EAGLE CREEK RENEWABLE ENERGY ANDROSCOGGIN RIVER, CLASS C, LISBON FALLS, ME			OTW, also include	Entry Time/Da 9 AM/12-15-16	te S	Permit Effective Date 6/10/2014
				Exit Time/Date 11:30 AM/12-15-16		Permit Expiration Date 6/10/2019
Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s) MARK A. SHERBINO, EAGLE CREEK RE: PLANT MANAGER Office (845) 856-3290; Cell (315) 777-3176; FAX: (845) 858-8804				Other Facility I descriptive info	Data (e.g. prmation)	, SIC NAICS, and other
THOMAS H. DERUBERTIS, PROJECT MANAGER Office (845) 856-3290; Cell (518) 764-2237; FAX: (845) 858-8804				Hydroelectric dam; very recently purchased from Brown Bear Hydro II (formerly Miller Hydro Group/Worumbo Hydroelectric Station): licensed non-contact cooling		
Office: (207) 353-9919/233-0081/FAX: (207	7) 353-9858			water discharge (daily maximum up to 1.015 MGD)		
BRIAN EASTMAN; 2 ND OPERATOR Office: (207) 240-4102	~					
Name, Address of Responsible Official/Title	e/Phone and Fax Numbe	er		•		
MARK A. SHERBINO, EAGLE CREEK RENEWABLE ENERGY; PLANT MANAGER 613 PLANK ROAD FORESTBURG, NY 12777 Office (845) 856-3290; Cell (315) 777-3176; FAX: (845) 858-8804						
	Contacted <u>YES</u>					:
Section C: A	Areas Evaluated Dur	ing Inspe	ction (Check only	those areas e	evaluate	d)
X Permit	Self-Monitoring Pr	ogram	Pretreatment		MS4	4
X Records/Reports	Compliance Sche	dules	Pollution Prev	ention		
X Facility Site Review	Laboratory		Storm Water			
X Effluent/Receiving Waters	X Operations & Maintenance		Combined Sewer Overflow			
Flow Measurement	Sludge Handling/	Disposal	Sanitary Sewe	er Overflow		
(attac	Section D: S ched: additional shee	ummary c	of Findings/Comm ative and checklis	ents ts as necessa	ary)	
SEV Codes SEV Description						
Name(s) and Signature(s) of Inspector(s) Agency/Office/Phone and DENISE FOURNIER REHR MARKED STRUCTURE STRUCTURE				Fax Numbers		Date:12/15/2016
Denise Tournier Both PROTECTION; CENTRAL MAINE OFFICE, AUGUSTA MAINE (2071) 287-9031/FAX (2071) 287-3435						

EPA Form 3560-3 (Rev 1-06) Previous editions are obsolete.

EAGLE CREEK RENEWABLE ENERGY/WORUMBO HYDRO STATION; Lisbon Falls, ME: Maine Pollutant Discharge Elimination System (MEPDES) Permit #ME0023469/Maine Waste Discharge License (WDL) #W007590-5R- E-R

This hydroelectric power generating system consists of two turbines, each rated for approximately 9.5 megaWatts. The turbines have been in operation since 1989. The facility is permitted to discharge up to 1.015 MGD of non-contact cooling water to the Androscoggin River, Class C in Lisbon Falls, ME, not to exceed 95 degrees Fahrenheit. The Department has calculated that under worst case conditions of maximum cooling water flow (1.015 MGPD), maximum cooling water temperature (assumed 95 degrees Fahrenheit, based on staff analysis of industry data), and 7Q10 receiving water flow (1994 cfs), without any treatment to reduce thermal loading the discharge will raise the ambient temperature of the receiving water by only 2/100^{ths} of a degree Fahrenheit. *The Department has determined that neither effluent limitations nor monitoring requirements are necessary to ensure that applicable water quality standards are met.*

Each generating turbine unit is a completely separate system - not connected to each other in any way. The two permitted outfall discharges are from 1. The non-contact cooling water sources and 2. Miscellaneous water sources.

Non-contact cooling water sources include generator cooling water flow (intake water used for cooling of the generator recycle air); Bearing cooling water flow (cooling of the turbine generator lube/hydraulic oil system); and Shaft seal flow (cooling of the turbine-rotary interfaces).

- •Outfall #001: Four air coolers used with turbine #1
- •Outfall #002: Four air coolers used with turbine #2
- •Outfall #003: One oil cooler used with turbine #1
- •Outfall #004: One oil cooler used with turbine #2

The air within each generating unit's cavity is cooled via non-contact tubal heat exchanger (the air coolers); which transfer heat from the air to the non-contact cooling water. Each generating unit also contains non-contact tubal heat exchangers (oil coolers) that cool the oil of the lubricating/hydraulic oil system; again heat is transferred to the non-contact cooling water. There are four air coolers and one oil cooler per generating unit. The air coolers run continuously while the oil coolers cycle on and off depending on unit load and water inlet temperature.

Other miscellaneous non-contact cooling water sources (i.e. water that may become contaminated with hydraulic or lubrication oil and grease) include water collected from rainwater/snowmelt from transformer drain trenching, pump seal leakage, leakage from wicket gates and other equipment; water used for cleaning of equipment, back flushing of shaft seal water filters; and station drains (condensate from cooling water pipes in winter; seepage through concrete/foundation. etc.).

Outfall #005: Oil/Water separator clean water sumpOutfall #006: Seasonal dewatering pump

Special Condition A: Effluent Limitations and Monitoring Requirements of the license includes:

Best Management Practices (BMPs):

•All miscellaneous facility leakage and lubrication waters that may become contaminated with oil or grease shall be subject to Best Management Practices (BMPs) designed to prevent the release of contaminants to the waters of the state. Within 90 days of permit issuance, BMPs shall be developed by the permittee and shall be available in writing for Department review and approval upon request. BMPs may consist of, but not be limited to, the following, as appropriate: development and implementation of a spill prevention plan; use of oil absorbent pads or booms and/or physical berms to contain spills or leaks of hydraulic and lubrication oils; and the treatment of water collected in floor drains and sumps through an oil/grease trap or oil-water separator. Where bearing cooling water is used, BMPs shall include the maintenance of a written log or record of bearing oil levels and maintenance activities. Where floor drains and sumps are used, BMPs shall include (1) written procedures for the cleaning and maintenance of any oil-grease trap, oil skimmer or oilwater separator and (2) maintenance of a written log or record of visual inspections of sumps for oil and grease and of actions taken to prevent the discharge of oil or grease from the facility.

Current and past BMPs include recording temperature readings (through the use of RTDs) of river inlet water, filter inlet water and recirculation water. A thermal gun is also used as backup when the temperature readings appear to indicate a plugged intake screen (ice crystals began to form in the inflow causing the liquid flow to decrease and the temperature in the thermal well to increase) or a bad RTD probe. Staff also checks water flow through each cooler system (using the flow gauge) and oil levels in the oil cooler weekly with all results recorded in the station log. If there was any water leakage into the oil cooler, the turbine oil would start to look milky; if there was a large leak of oil out of the heat exchange tubes, staff would notice the oil level lowering in the tanks and the oil would be discharged to the river along with the non-contact cooling water flow.

•Development and implementation of a spill prevention plan: The SPCC plan has been reviewed annually by the Station Manager who adds minor changes as needed. The plan is normally reviewed and updated by a P.E. every five years, however this station has been recently purchased by *Eagle Creek Renewable Resources* and the new owners plan to review and update both the current BMPs and the SPCC plan as needed. This includes changes to the current schematic for the flow and temperature readings locations. <u>A copy of the updated BMPs and SPCC plan will be forwarded electronically to the Department when completed.</u>

• Use of oil absorbent pads or booms and/or physical berms to contain spills or leaks of hydraulic and lubrication oils: Approximately 150 absorbent pads and a maximum of 10 absorbent pillows are kept onsite to contain any spills or leaks of hydraulic and lubrication oils. Currently onsite are 1 ½ bundles of absorbent pads (150), 8 absorbent pillows (used typically in the clean water sump) and enough boom to go across the entire tailrace if spill containment is needed. Oil spill kits are also kept on hand. Direct discharges to the river could be from any leaking trash rake hydraulic fluid (biodegradable); turbine runner lubricating oil and /or hydraulic oil for the fish gate inlet gate operating systems. All these areas are checked daily during rounds. In the event that oil from either turbine runner would be observed in the tailrace, the station would be taken out of service if necessary to minimize the flow of oil and the station oil absorbent boom would be placed across the tailrace to contain the spill. Along with these actions, appropriate authorities and vendors would be contacted.

• Treatment of water collected in floor drains and sumps through an oil/grease trap or oil-water separator. The water from the miscellaneous sources and any oil or grease leaks from the runner hub compensation tank, governor/lube oil tank, oil storage tanks, and air/oil accumulating systems will go directly to the main 2-compartment sump in the basement where an AMOS (automatic multi oil separator) is maintained by the facility. The AMOS is used 90% of the time to skim off oil/oily waste in the first compartment of the main sump while it is used the remaining time to remove any flow-through sheen in the second sump compartment (the floating skimmer can be moved between either side of the sump). There is no backup power for operation of the AMOS; if power is cut off, the AMOS stops working. The Department recommends that backup power be considered for this equipment. The facility installed two new sensors in the system after May 16, 2014. These sensors are installed in the storage barrels for the removed tramp oil and were installed to prevent the barrel(s) from over-flowing onto the floor. Now when the barrels reach nearly full capacity, the sensor(s) will turn off the AMOS and an alarm will alert staff of the condition so that the barrel(s) can be changed.

The main sump (with a volume of ~ 3250 gallons) discharges to a clean water sump (with a volume of ~ 1196 gallons) equipped with a tied-off sorbent pillow, an oil sensor, float level switches and an alarm system. The clean water sump discharges periodically to the river. The clean water sump is equipped with two 150 HP GPM pumps used alternately under normal conditions. If oil is detected, the light turns off, the alarm system

transmits an alarm condition to the operator and the pumps will not operate. The floats on the float tree are of the non-mercury type; while the High/High level float (the "trouble alarm") which is usually out of the water may be of the old style and contain mercury. The Department recommends that any mercury containing floats be replaced with a non-mercury type and the mercury containing float be properly disposed of either at the Lisbon transfer station (if they accept mercury containing equipment) or through a vendor like Clean Harbors. Per the station's BMPs/SPCC plan, the floats are tested once per month.

•Where bearing cooling water is used; BMPs shall include the maintenance of a written log or record of bearing oil levels and maintenance activities. Bearing oil levels are visually inspected weekly and are recorded in the station log. There is a daily visual check of the entire facility including the oil/water separator and the two-compartment sump, with observations entered daily into the station log. Each operator enters the maintenance results data in a hand-written log; each operator's handwriting is unique and recognizable. A monthly printout of maintenance activities is kept on the office door and items are initialed as they are completed. At the end of the month, the monthly tasks list is signed. This routine of daily entries in the station log may or may not remain the same; any changes will be based on the requirements of the new owners.

•Where floor drains and sumps are used, BMPs shall include (1) written procedures for the cleaning and maintenance of any oil-grease trap, oil skimmer or oil-water separator and (2) maintenance of a written log or record of visual inspections of sumps for oil and grease and of actions taken to prevent the discharge of oil or grease from the facility. Written procedures for cleaning and maintenance of the AMOS and the two-compartment sump can be found in the O&M section of the current BMPs/SPCC plan. Staff collects a sample of the discharge water from the main sump every six months when the AMOS is thoroughly inspected and sends it out to a Maine certified laboratory for testing. During this inspection the floor around the AMOS was a bit slick/oily and the sorbent pad in the sink appeared quite oily/dirty. One filter bag was in use with the AMOS while the spare had been cleaned and was available for use.

Unit #1 was in use during this inspection. Every day maintenance activities and actions to prevent discharge of any oil or grease from the facility include visually checking all oil storage tanks; visually checking oil supply and drain piping; checking the station two-compartment and clean water sumps; checking the operation of the AMOS; and checking the tailrace for signs of leaking oil from either turbine runner or from other source(s). The tailrace area is checked twice a day on weekdays and once a day on weekends for any evidence of petroleum product discharge.

A preventive maintenance plan is found in the Operator's Manual/SPCC Plan. There is no monthly instrument calibration as the RTDs are long-term simple devices (replaced when they no longer operate correctly) and the backup thermal gun is not calibrated before use. Onsite staff is familiar with the normal temperature range and follow up on any slight change in temperature out of the ordinary. Fail open and Fail closed conditions would produce an extremely low or extremely high reading that would be investigated immediately.

The facility's alarm system operates 24 hrs/day-7days/week-365 days/year. During non-manned hours, the alarm currently consists of a dial-up system and primary and secondary pagers that will continue to cycle until someone acknowledges the alarm condition and physically comes in to disarm the alarm. Normally the alarm first pages the on-duty operator, then the back-up operator, and eventually the plant manager.

Large oil leaks from either generating unit would cause the associated turbine to shut down quickly due to a drop in the oil system pressure (setting off an alarm which would note which unit had shut down). Smaller leaks would cause the runner hub tank oil pump to start and try to maintain the oil level and while this was occurring the oil would continue to leak until enough oil had leaked out to cause the unit to trip out due to low oil level. If the main turbine runner seals failed; all the oil would end up in the river via the tailrace. The maximum amount of oil within each contained turbine/hydraulic system is 3600 gallons.

Other Areas of Possible Sources of oil/grease contaminated water:

NO CHANGE: The facility is equipped with both an upstream and a downstream fish passage. The upstream passage includes a vertical lift and two entry way gates (the fish lift system inlet gates hydraulic operating system). This system consists of an 18 gallon reservoir tank, a 10 gallon accumulator tank, two 13 ft long hydraulic rams, 200 plus ft of ½ inch S/S tubing plus miscellaneous control valves. Biodegradable oil is used. Both tanks have level detection float switches. The switches alarm for High level and Low level. An alarm light turns on if the level reaches High and the pumps will shut off if the floats alarm for Low level, (this includes if the reservoir tank gets below 1/3 full). There is a spill pan in place under the pump and reservoir tank for containment. All other leaks would end up in the river. The mill side gate is controlled either automatically (station computer) or manually. The river side gate is operated by a manually operated hydraulic control valve. The area equipment is checked daily for leaks. **No signs of leaks was noted during this inspection**.

NO CHANGE: The Fish Viewing and Counting Room: The airbag equipment consists of one low pressure air compressor that contains 41 ounces of synthetic oil. The flood gate deicer air blower unit contains 64 ounces of synthetic oil. A spill containment pan is in place and is large enough to contain any oil spilled from this equipment. This area is checked daily. No signs of leaks was noted during this inspection.

NO CHANGE: Trash Rake: This is only manually operated, contains ~ 70 gallons (a little less than two barrels) of oil (biodegradable vegetable-based oil). Small leaks are captured with sorbent pads. A catastrophic leak (hose leak, etc.) would escape onto the station inlet deck or directly to the river until staff was able to contain it with absorbent pads and boons. No signs of leaks was noted during this inspection.

Most drums of oil are kept within containment. The drums located in the basement are not in containment; but any leakage would reach the two compartment oil/water separator sump.

Sanitary water is collected in a holding tank that is periodically pumped out.

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS SUMMARY:

---- There were no unauthorized discharges of pollutants during this inspection year. The one spill reported in May 2014 did not cause any oil to be discharged to the river as it was captured by the oil/water separator sump and AMOS. The spill was caused by an overflow from the AMOS to the captured oil barrel and both barrels were retrofitted with sensors to prevent any overfills from occurring again.

--- There were no changes in the design, operation (flow or temperature of cooling water), or generating capacity of the facility;

--- The BMPs and SPCC will be reviewed and updated as needed by the new owners. An updated and signed electronic copy will be sent to the Department once it is completed. Currently the BMPs/SPCC Plan contains an Introduction, Facility Description, Spilled Oil Migration and Harmful Effects, Oil Types, Quantities, and Storage; Operations and Maintenance of the Oil/Water Separator; Potential Discharge Volumes and Direction of flow; Spill Prevention; Spill Control Interlocal Agreement and Oil Response Plan and applicable attachments. Attachment D; the non-contact Cooling Water flow diagram was discussed during this inspection and it was agreed that it needs some updates.

---- There is a daily checklist and a monthly maintenance schedule; this may or may not change dependent on the instructions from the new owners.



ANGUS S. KING, JR. GOVERNOR

January 18, 2002

MARTHA KIRKPATRICK COMMISSIONER

Bearl S. Keith **Project Administrator** Miller Hydro Group 148 Middle Street Portland, ME 04101

RE: **Compliance Status** Worumbo Hydro Project FERC No. 3428

Dear Bearl:

This is to confirm that compliance with 401 water quality certification conditions for the Worumbo Hydro Project, FERC No. 3428, is now complete.

A Compliance Status Report for this project is enclosed for your records.

Thank you for your attention to these compliance requirements. If you have any questions about your compliance status, or any information contained in the enclosed report, please give me a call at 207-287-7784, or you can contact me by e-mail at dana.p.murch@state.me.us.

Sincerely,

ang fail Murch

Dana Paul Murch Dams & Hydro Supervisor

cc: Fred Springer, Compliance-FERC

AUGUSTA 17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017 106 HOGAN ROAD (207) 287-7688 RAY BLDG., HOSPITAL ST.

BANGOR BANGOR, MAINE 04401

PORTLAND 312 CANCO ROAD PORTLAND, MAINE 04103

PRESQUE ISLE 1235 CENTRAL DRIVE, SKYWAY PARK PRESQUE ISLE, MAINE 04769-2094 (207) 941-4570 FAX: (207) 941-4584 (207) 822-6300 FAX: (207) 822-6303 (207) 764-0477 FAX: (207) 764-1507

WQC COMPLIANCE STATUS REPORT

PROJECT: WORUMBO

LOCATION: <u>Town of Lisbon</u> <u>Androscoggin River</u>

FERC No. <u>3428</u>

Date license issued: 12/24/1985

DEP # <u>L-10930</u>

Date 401 cert issued: 06/12/1985

OWNER/OPERATOR: MILLE

MILLER HYDRO GROUP

CONDITION		DATE	DATE	
NUMBER	DESCRIPTION	DUE	APPROVED	
1	Water Level Maintenance			
	(no compliance filing required)			
			A Contra Caracter State	
2	Minimum Flow Requirements			
	(no compliance filing required)			
2(1)		and the state of the	Sale Antonio Section	
3(A)	Interim Minimum Bypass Flow			
	(no compliance filing required)			
2(D)			The second second	
) S(B)	Bypass Flow Study Plan	06/12/1988	09/21/1987	
Contraction and the second second				
3(C)	Bypass Flow Study Decults (Decu	allan alla dat dat dat dat and	a la constance des	
5(0)	Elow Branges	1 yr after project	03/20/1992	
	Flow Proposal	goes on-line		
3(A)**	Permanent Minimum Rypage Flow		all interaction	
	(no compliance filing required)	***************************************		
3(B)**	Annual Funding for Fisheries		Edució de la como	
	Management Activities			
	(no compliance filing required)			
3(C)**	Dam Modifications to Concentrate Spill	Per FERC order	07/26/1004	
	over West Section of Dam		07/20/1994	
3(D)**	Minimum Flow Monitoring Plan	6 mos after FERC	07/26/1994	
		approval		
In the second state				
4(B)	Erosion and Sedimentation Control Plan	Prior to project	01/15/1986	
		construction		
4/D)/1)#				
4(B)(1)**	Construction & Excavation Spoils	Prior to off-site	Not needed	
	Disposal Plan	disposal		
5(1)		t and the support to a	an iste soonen en	
3(A)	Downstream Fish Passage Facilities	To be operational	Installed &	
		concurrent with	operating	
		project		
AG (MARCA) (25) (17) (35)				

5(B)	Upstream Fish Passage Facilities	To be operational by 05/01/1989	Installed & operating	
5(C)	Upstream and Downstream Fish Passage Design Plans	Prior to passage construction	03/03/1988	
6(B)	Bypass Fish Passage Needs Study Plan	05/01/1988	<u></u>	
6(C)	Bypass Fish Passage Needs Study Results/Additional Fish Passage Proposal	5 yrs after power- house fishway goes on-line	See note below	
7	Boat Access Facility Plans	Prior to project operation	03/03/1988	
8	Evidence of Financial Capacity	Prior to project construction	05/06/1986	
1***	Standards Conditions of Approval (no compliance filing required)		1995-1997 2017-1997 	
2***	All Existing Conditions in Effect (no compliance filing required)			
3(C)***	Water Level Monitoring Plan	Prior to raising impoundment level	02/01/2000	
4(C)***	Minimum Flow Monitoring Plan	Prior to raising impoundment level	02/01/2000	
5***	Shoreline Erosion Survey Results	3 yrs after raising impoundment level	01/16/2002	

* Per compliance order #1-10930-35-C-M issued 01/15/1986.

** Per amendment order #1-10930-35-L-A issued 03/20/1992.

*** Per modification order #1-10930-35-N-M issued 07/13/1998 (approving 1.5 ft increase in impoundment elevation).

Note: Fish passage efficiency studies were conducted annually from 1990 through 1995. The runs of alewives being studied were small, and study results were inconclusive. By Order dated November 12, 1998, FERC agreed that further studies should be discontinued until such time as needed.

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COMPLIANCE COMPLETE



STATE OF MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION 17 STATE HOUSE STATION AUGUSTA, MAINE

ANGUS S, KING, JR OOVERNOR

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DEPARTMENT ORDER

IN THE MATTER OF

MILLER HYDRO GROUP, INC.) LISBON, ANDROSCOGGIN COUNTY, ME.) WORUMBO HYDRO PROJECT) FLASHBOARD REPLACEMENT) #L-10930-35-N-M (Approval))

MAINE WATERWAY DEVELOPMENT AND CONSERVATION ACT AND WATER QUALITY CERTIFICATION

FINDINGS OF FACT AND ORDER PERMIT MODIFICATION

Pursuant to the provisions of 38 MRSA Sections 464 et seq. and Sections 630 et seq., 06-096 CMR 450 (Administrative Rules for Hydropower Projects, effective date September 1, 1987), and Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act), the Department of Environmental Protection has considered the application of MILLER HYDRO GROUP, INC. with its supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. APPLICATION SUMMARY

- a. Application. The applicant proposes to replace the existing flashboard system and modify the operation of the existing Worumbo Hydro Project, located on the Androscoggin River in the Towns of Lisbon and Durham, Androscoggin County, Maine.
- b. Existing Project. The Worumbo Project consists of a 770-foot-long concrete and timber crib overflow dam, a gated spillway section, an intake section, and an integral powerhouse equipped with two turbine-generator units having a rated capacity of 19.2 MW at a net operating head of 30 feet. The dam creates an impoundment with a surface area of 190 acres at a normal full pond elevation of 97.0 feet msl. The project is currently operated as a run-of-river facility, with outflow approximately equal to inflow on an instantaneous basis. The project is also operated to provide seasonally-varied minimum flow releases into the 850-foot-long bypassed river reach between the Durham-side dam and the end of the tailrace training wall.

The construction and operation of the existing project has been approved by the Board of Environmental Protection (Board Order #L-10930-35-A-N, dated June 12, 1985, as amended). The project is operated as a hydroelectric generating facility under the terms of FERC License No. 3428.



MILLER HYDRO GROUP, INC. LISBON, ANDROSCOGGIN COUNTY, ME. WORUMBO HYDRO PROJECT FLASHBOARD REPLACEMENT

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c. Summary of Flashboard Replacement Proposal. The applicant proposes to install pneumatically operated hinged steel crest gates over the Durham-side dam and hinged conventionally operated flashboards over the remaining dam. The new crest gate/flashboard system will raise the normal full pond elevation of the impoundment by 1.5 feet, to 98.5 feet msl, and will have a negligible impact on the size of the impoundment.

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To accommodate the new crest gates and flashboards, the applicant proposes to remove about 1,000 square feet of wooden planking; remove about 3 cubic yards of ledge; remove about 3.5 cubic yards of concrete; and add about 65 cubic yards of concrete to the existing dam structure. The proposed work will all take place using temporary sand bag cofferdams and limited impoundment drawdowns as needed.

In addition, in order to improve the stability of the dam, the applicant proposes to pour about 15 cubic yards of concrete about 2 feet wide and 4 feet high along about 35 feet of the downstream toe of the timbercrib dam section. This concrete mass will be pinned to the underlying ledge and will serve as a shear block to prevent dam failure.

With the higher operating head created by the increased impoundment level, the installed generating capacity of the project will increase by about 200 KW to 19.4 MW, and average generation will increase by about 4.2 million kilowatt hours a year.

The new crest gates/ flashboards will be designed to fully deflate or fail when overtopped by 2 feet of water.

The estimated cost of installation of the new crest gate/flashboard system is about \$500,000. The applicant expects to be able to complete the installation in a single summer low flow construction season.

d. Summary of Proposed Project Operation. Once the proposed new crest gate/flashboard system is in place, the applicant further proposes to modify current run-of-river operation to allow the impoundment to be drawn down by a maximum of 1.5 feet (which is equivalent to the proposed increase in headpond elevation). This will allow the owner to to maximize the energy and capacity of the project, to provide short-term reserve capacity to the interstate power grid, and to provide ancillary services (i.e., Automatic Generation Control) to the power grid under future deregulated market conditions.

The applicant proposes to maintain a minimum flow release from the project of 1,700 cfs or inflow, whichever is less, during impoundment refilling, and to maintain the current minimum flow releases to the bypass reach.

MILLER ITT DRO GROOF, INC. LISBON, ANDROSCOGGIN COUNTY, ME. WORUMBO HYDRO PROJECT FLASHBOARD REPLACEMENT MAINE WATERWAY DEVELOPMENT AND
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- 2. JURISDICTION
 - a. <u>Hydropower Project Permit</u>. The proposed flashboard replacement qualifies as the "construction, reconstruction or structural alteration of a hydropower project" under the Maine Waterway Development and Conservation Act (MWDCA), 38 MRSA Section 630 et seq. The proposed modification of project operation qualifies as a change in the terms and conditions of the MWDCA permit currently in effect for the project that must be approved by the Department.

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b. Water Quality Certification. The proposed flashboard replacement and modification of project operation qualify as an "activity...which may result in (a) discharge into the navigable water (of the United States)" under the Clean Water Act (CWA), 33 USC 1251 et seq. Section 401 of the CWA requires that any applicant for a federal license or permit to conduct such an activity will comply with applicable State water quality standards.

The applicant has filed an Application for Amendment of License for the Worumbo Hydroelectric Project with the Federal Energy Regulatory Commission to authorize the proposed new crest gate/flashboard system and modification of project operation.

- c. Terms and Conditions. Section 401(d) of the CWA provides that a water quality certification shall set forth any limitations necessary to assure that an applicant for a federal license or permit will comply with any appropriate requirement of state law, and that such limitations shall become a condition on the federal license or permit issued for the activity. As discussed above, a permit is required under the MWDCA for the proposed new crest gate/flashboard system and modification of project operation. The MWCDA is a state water quality-related law. Consequently, the terms and conditions of any permit issued for this project constitute appropriate and necessary limitations to be set forth in any certification issued for the project.
- 3. APPLICABLE WATER QUALITY STANDARDS
 - a. <u>Classification</u>. The Androscoggin River is classified as having Class C waters from the Ellis River in Rumford to a line formed by the extension of the Bath-Brunswick boundary across Merrymeeting Bay.
 - b. <u>Designated Uses</u>. Class C waters shall be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation; and as habitat for fish and other aquatic life.
 - c. <u>Numeric Standards</u>. The dissolved oxygen content of Class C waters shall be not less than 5 parts per million or 60% of saturation, whichever is higher, except that in identified salmonid spawning areas where water quality is sufficient to ensure spawning, egg

MILLER HYDRO GROUP, INC. LISBON, ANDROSCOGGIN COUNTY, ME. WORUMBO HYDRO PROJECT FLASHBOARD REPLACEMENT

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incubation and survival of early life stages, that water quality sufficient for these purposes shall be maintained.

d. <u>Narrative Standards</u>. Discharges to Class C waters may cause some changes to aquatic life, provided that the receiving waters shall be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community.

The habitat characteristics and aquatic life criteria of Class C are deemed to be met in an existing impoundment which is classified C provided that any reasonable changes are implemented that do not significantly affect existing energy generation capability and that would result in an improvement in the habitat and aquatic life of the impounded waters. Where the actual quality of the impounded waters attains any more stringent habitat characteristic or aquatic life criteria than that required under Class C, that existing water quality must be maintained and protected.

e. Antidegradation. The Department may only approve water quality certification if the standards of classification of the waterbody and the requirements of the State's antidegradation policy will be met. The Department may approve water quality certification for a project affecting a waterbody in which the standards of classification are not met if the project does not cause or contribute to the failure of the waterbody to meet the standards of classification.

3. DISSOLVED OXYGEN

The proposed increase in impoundment full pond level and allowance for a 1.5 foot impoundment drawdown will not result in any significant increase in time-of-travel through the impoundment. Therefore, these proposals are not expected to have any adverse impact on dissolved oxygen levels in the river.

4. AQUATIC LIFE

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The proposed increase in impoundment full pond level will not result in any significant increase in impoundment volume. The proposed allowance for a 1.5 foot impoundment drawdown will not result in any significant dewatering of aquatic habitat. Therefore, these proposals are not expected to have any beneficial or adverse impacts on aquatic life in the river.

5. FISH RESOURCES

The lower Androscoggin River is currently managed for warmwater game species, principally smallmouth bass, pickerel and yellow perch, and forage species such as minnows and white suckers. Brown trout are currently being experimentally stocked in the project area. The three lowermost dams on the river (Brunswick, Pejepscot and Worumbo) are currently operated with

MILLER HYL	ROUP, INC.
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upstream and downstream passage facilities for migrating anadromous fish, including Atlantic salmon, American shad and alewive.

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The Department of Inland Fisheries and Wildlife has commented that present warmwater game fish populations are being maintained under current project conditons, and that the proposed increase in impoundment full pond level and allowance for a 1.5 foot impoundment drawdown should not interfere with these populations, provided that minimum flow releases are provided as proposed by the applicant.

The Department of Marine Resources has commented that, due to high mean flows during the May and June fish migration season, any impoundment drawdown will be infrequent and of limited duration, and that the proposed increase in impoundment full pond level and allowance for a 1.5 foot impoundment drawdown should not have any significant impact on anadromous fish habitat or fish passage, provided that minimum flow releases are provided as proposed by the applicant.

6. RECREATION

Public recreational boat access to the project impoundment is available at the Town of Lisbon boat launch located on the Sabattus River immediately above its confluence with the Androscoggin River. The proposed increase in normal impoundment level will decrease the clearance for boats under the railroad bridge and Route 196 highway bridge, both of which are located between the boat launch and the Androcoggin River.

The DIF&W and the Department of Conservation have both commented that adequate clearance will be maintained under the bridges under the new impoundment level, and that the project should not interfere with existing recreational access.

7. HISTORIC AND ARCHAEOLOGICAL RESOURCES

The Maine Historic Preservation Commission has commented that the proposed increase in normal impoundment level will not exacerbate erosion of any archaeological sites.

8. WILDLIFE AND WETLANDS

There are no endangered or threatened species of wildlife known to reside in the project area. In addition, no Significant Wildlife Habitats has been identified in the project area.

The DIF&W has commented that steep banks along the impoundment have limited the development of wetlands and that the proposed increase in impoundment full pond level is unlikely to substantially affect wetland wildlife habitat.

MILLER HYDRO GROUP, INC. LISBON, ANDROSCOGGIN COUNTY, ME. WORUMBO HYDRO PROJECT FLASHBOARD REPLACEMENT

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9. FLOOD CONTROL

Under flood conditions, the new crest gates will be completely deflated and the new flashboards will have failed so as to have no impact on the level of the impoundment at all river flows above about 30,000 cfs. Therefore, the project will not result in any loss of existing flood control.

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10. SOIL STABILITY

The proposed increase in normal impoundment level has the potential for increasing erosion along any unstable sections of impoundment shoreline.

The applicant proposes to conduct a survey of the impoundment shoreline both prior to and during the first three years following the raising of the impoundment level. The applicant should be responsible for addressing any significant erosion that is found to occur as a result of the raising of the impoundment.

11. HYDROELECTRIC POWER GENERATION

The proposed increase in impoundment level will increase average annual generation at the Worumbo Project by 4.2 million kilowatt hours. This is equivalent to the electricity that would be produced bu burning 7,000 barrels of oil or 1,946 tons of coal each year.

12. OTHER ISSUES; REVIEW COMMENTS

Erosion and sedimentation caused by the movement of construction equipment and supplies can result in degradation of water quality and impairment of aquatic habitat.

"Fresh" concrete can be toxic to aquatic life when place in contact with river water prior to curing.

Concrete chippings and other construction debris can cause environmental problems unless disposed of adequately.

Impoundment drawdowns during construction may interfere with fish passage or impact fish habitat.

No other significant issues involving any statutory criteria of the Maine Waterway Development and Conservation Act have been identified. No objections to the proposed activity have been raised by State review agencies or the affected municipalities.

BASED on the above Findings of Fact, and the evidence contained in the application and supporting documents, and subject to the Conditions listed below, the Department makes the following CONCLUSIONS:

MILLER HYDRO GROUP, INC.
LISBON, ANDROSCOGGIN COUNTY, ME.
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1. The applicant has the financial capacity and technical ability to undertake the project.

- 2. The applicant has made adequate provision for protection of public safety.
- 3. The project will result in significant economic benefits to the public.
- 4. The applicant has made adequate provision for traffic movement.
- 5. The proposed activity is not located within the jurisdiction of the Land Use Regulation Commission.
- 6. The applicant has made reasonable provisions to realize the environmental benefits and to mitigate the adverse environmental impacts of the project provided that:
 - All existing permit conditions remain in effect except as specifically modified by this approval;
 - b. Following the installation of the new crest gate/flashboard system, impoundment levels are maintained between elevation 98.5 feet msl and 97.0 feet msl;
 - c. Following the installation of the new crest gate/flashboard system, a minimum flow of 1,700 cfs or inflow, whichever is less, is maintained during impoundment refilling;
 - Adequate measures are taken to assess and mitigate any significant bank erosion caused by the raising of the impoundment;
 - All necessary measures are taken to control erosion and sedimentation due to construction activities;
 - f. Fresh concrete does not come into contact with surface water;
 - g. Concrete and ledge chippings and other construction debris are caught where safe to do so and disposed of in accordance with established regulations; and
 - Any temporary impoundment drawdowns during the approved flashboard installation and dam repair work are approved by the appropriate state fisheries agencies.
- The advantages of the project are greater than the direct and cumulative adverse impacts over the life of the project provided that the project is undertaken in accordance with the provisions of Conclusion #6 above.

 MILLER HYDRO GROUP, INC.
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 PERMIT MODIFICATION

THEREFORE, the Department APPROVES the above noted application of MILLER HYDRO GROUP, INC. to install a new flashboard system and undertake dam repairs at the Worumbo Hydro Project, as described above, SUBJECT TO THE ATTACHED CONDITIONS, and all applicable standards and regulations:

1. STANDARD CONDITIONS

The Standard Conditions of Approval for projects under the Maine Waterway Development and Conservation Act, a copy attached.

2. EXISTING PERMIT CONDITIONS

All existing permit conditions for the Worumbo Project as contained in Board Order #L-10930-35-A-N dated June 12, 1985, and as subsequently amended, shall remain in effect except as specifically modified by this approval.

3. WATER LEVELS

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- A. Following the installation of the new crest gate/flashboard system, and except as temporarily modified by approved maintenance activities, inflows to the project area, and operating emergencies beyond the applicant's control, as defined below, water levels in the project impoundment shall be maintained between elevation 98.5 feet and 97.0 feet mst.
- B. Operating emergencies beyond the applicant's control include, but may not be limited to, equipment failure or other temporary abnormal operating condition, generating unit operation or interruption under power supply emergencies, and order from local, state, or federal law enforcement or public safety authorities.
- C. The applicant shall, in accordance with a schedule established by FERC, submit plans for monitoring and providing the impoundment water levels required by Part A of this condition. These plans shall be reviewed by and must receive approval of the DEP Bureau of Land and Water Quality.
- 4. MINIMUM FLOWS
 - A. Following the installation of the new crest gate/flashboard system, and except as temporarily modified by approved maintenance activities, inflows to the project area, and operating emergencies beyond the applicant's control, as defined below, a minimum flow of 1,700 cfs or inflow, whichever is less, shall be maintained from the project during any impoundment refilling following a drawdown of up to a maximum of 1.5 feet.

MILLER HYDRO GROUP, INC.
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B. Operating emergencies beyond the applicant's control include, but may not be limited to, equipment failure or other temporary abnormal operating condition, generating unit operation or interruption under power supply emergencies, and order from local, state, or federal law enforcement or public safety authorities.

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C. The applicant shall, in accordance with a schedule established by FERC, submit plans for monitoring and providing the minimum flows required by Part A of this condition. These plans shall be reviewed by and must receive approval of the DEP Bureau of Land and Water Quality.

5. EROSION SURVEY

The applicant shall, in consultation with the Department of Inland Fisheries and Wildlife, conduct a survey of shoreline erosion along the banks of the project impoundment both prior to and during the first three years following the raising of the impoundment. The applicant shall submit a report detailing the results of the survey and any measures taken or recommended to mitigate any significant bank erosion caused by impoundment water levels.

6. EROSION CONTROL

In addition to any specific erosion and sedimentation control measures proposed by the applicant and/or set forth in this Order, the applicant and its agents shall take all necessary measures to ensure that their activities do not result in measurable erosion or sedimentation during or after the approved work.

7. CONCRETE CURING

Concrete shall be precast and cured at least three weeks before placing in the water, or where necessary, shall be placed in forms and shall cure at least one week prior to contact with surface water. No washing of tools, forms, etc. shall occur in or adjacent to the waterway.

8. SPOILS DISPOSAL

Concete and ledge chippings shall be caught and held for disposal where reasonable to do so, given consideration of worker safety, costs, and any contraints on access. All captured chippings and any other solid waste generated by the project shall be disposed of in accordance with the Maine Solid Waste Management Regulations.

MILLER HYDRO GROUP, INC. LISBON, ANDROSCOGGIN COUNTY, ME. WORUMBO HYDRO PROJECT FLASHBOARD REPLACEMENT

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9. TEMPORARY CONSTRUCTION DRAWDOWNS

The applicant shall notify and receive approval from the Department of Inland Fisheries and Wildlife and the Department of Marine Resources that any temporary impoundment drawdowns needed to facilitate the installation of the new crest gate/flashboard system will not impair resident fisheries habitat or interfere with anadromous fish passage.

DONE AND DATED AT AUGUSTA, MAINE, THIS 3^{L} DAY OF f_{1} , 1998. DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Edward O. Sullivan, Commissioner

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 5/14/98

Date application accepted for processing: 5/19/98



Date filed with Board of Environmental Protection:

This Order prepared by Dana Murch.

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STANDARD CONDITIONS OF APPROVAL TO BE ATTACHED TO ALL HYDROPOWER PERMITS

- Limits of Approval. This approval is limited to and includes the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. All variances from the plans and proposals contained in said documents are subject to the review and approval of the Board or Commission prior to implementation.
- 2. <u>Noncompliance</u>. Should the project be found, at any time, not to be in compliance with any of the conditions of this approval, or should the permittee construct or operate this project in any way other than specified in the application or supporting documents, as modified by the conditions of this approval, then the terms of this approval shall be considered to have been violated.
- <u>Compliance with all Applicable Laws</u>. The permittee shall secure and appropriately comply with all applicable federal, state and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation.
- 4. Inspection and Compliance. Authorized representatives of the Board, Commission or the Attorney General shall be granted access to the premises of the permittee at any reasonable time for the purpose of inspecting the construction or operation of the project and assuring compliance by the permittee with the conditions of this approval.
- 5. <u>Initiation and Completion of Construction</u>. If construction is not commenced within 3 years and completed within 7 years from the date of issuance of this permit, this approval shall lapse, unless a request for an extension of these deadlines has been approved by the Board or Commission.
- <u>Construction Schedule</u>. Prior to construction, the permittee shall submit a final construction schedule for the project to the Commissioner or Director.
- <u>Approval Included in Contract Bids</u>. A copy of this approval must be included in or attached to contract bid specifications for the project.
- 8. <u>Approval Shown to Contractor</u>. Work done by a contractor pursuant to this approval shall not begin before a copy of this approval has been shown to the contractor by the permittee.
- <u>Notification of Project Operation</u>. The permittee shall notify the Commissioner or Director of the commencement of commercial operation of the project within 10 days prior to such commencement.
- 10. Assignment or Transfer of Approval. This approval shall expire upon the assignment or transfer of the property covered by this approval unless written consent to transfer this approval is obtained from the Board or Commission. A 'transfer' is defined as the sale or lease of property which is the subject of this approval, or the sale of 50 percent or more of the stock of or interest in a corporation or a change in a general partner of a partnership which owns the property subject to this approval.

Effective 9/87

ENVIRONMENTAL ASSESSMENT

APPLICATION FOR AMENDMENT OF LICENSE

WORUMBO HYDROELECTRIC PROJECT

FERC PROJECT NO. 3428-080

MAINE

Federal Energy Regulatory Commission Office of Hydropower Licensing Division of Licensing and Compliance 888 First Street, N.E. Washington, D.C. 20426

AUGUST 1998

Project Name: Worumbo Hydroelectric Project

FERC Project No. 3428-080

A. APPLICATION

- 1. Application Type: Amendment of License
- 2. Date filed with the Commission: May 15, 1998
- 3. Applicant: Miller Hydro Group, Incorporated
- 4. Water Body: Androscoggin River
- 5. Nearest City or Town: Durham and Lisbon, Maine
- 6. County: Androscoggin State: Maine

B. PURPOSE AND NEED FOR ACTION

On May 15, 1998, Miller Hydro Group, Incorporated (licensee) filed an application to amend its license for the existing Worumbo Hydroelectric Project. The amendment would allow the licensee: (1) to increase the normal elevation of the project impoundment by 1.5 feet (from 97.0 feet mean sea level (msl) to 98.5 feet msl) by installing crest control gates on the Durham side and manual hinged flashboards on the Lisbon side of the existing dam; and (2) to implement cycling of generation, instead of the current run-of-river mode of operation, thereby periodically drawing down the reservoir by 1.5 feet.

The proposed 1.5-foot increase in headpond elevation would increase the project's gross head by 5.2 percent, resulting in an increase in its average yearly generation by 4,200,000 kilowatthours (kWh).

C. DESCRIPTION OF PROJECT

The existing dam at the project includes the following sections:

(1) a 17-foot-high, 520-foot-long, rock-filled timber crib dam on the west (Durham side) of the river, including a 170-foot length reinforced by a concrete face, with a crest elevation of 97.0 feet mean sea level (msl);

(2) a center section of exposed rock ledge, including a 150foot length of concrete dike, with a maximum height of 4 feet and a crest elevation of 97.0 feet msl;

(3) a 12-foot-high, 260-foot-long uncontrolled concrete ogee spillway on the east (Lisbon Falls) side of the river with a crest elevation of 97.0 feet msl; and (4) a gated spillway containing four 23-feet-high by 19.25feet-wide slide gates operated for flood control.

Existing project facilities also include:

(1) a 180-acre reservoir at the current normal maximum elevation, 97.0 feet msl, having a gross storage capacity of 1,700 acre-feet;

(2) a concrete intake structure, integral to the powerhouse, containing two vertical slide gates, an hydraulic trash rack, three entrances for downstream fish passage, and one exit for the upstream fish passage;

(3) a 150-foot-long by 105-foot-wide, reinforced concrete powerhouse containing two Kaplan bulb turbines with a maximum hydraulic capacity of approximately 9,600 cubic feet per second (cfs) and a net head of 30 feet, directly connected to two synchronous generators, with a total authorized installed capacity of 19.2 megawatts (MW), but which together are able to generate a maximum of 18.4 MW;

(4) a 450-foot-long tailrace channel;

(5) a 500-foot-long, 34.5-kilovolt, underground transmission line;

(6) upstream and downstream fish passage facilities; and

(7) appurtenant facilities.

Existing upstream fish passage facilities at the project include two entrances, four attraction water pumps, a mechanically operated fish crowder, a cable-operated fish lift, an upper level canal, a fish counting room, and an automatic control system.

The project's downstream fish passage facilities include three entrances at the intake, a collection gallery, a 36-inchdiameter plastic transfer pipe, and a stop log-controlled plunge pool.

The project also includes a boat launch located at the upstream end of the project reservoir with adjacent parking and picnic facilities.

The project, which currently is operated as a run-of-river facility, generates an average of 80,000,000 kWh per year.

The original license for the Worumbo Project required the licensee to provide a continuous minimum flow of 25 cfs in the project's 8-acre bypassed reach, which extends from the project

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dam downstream to the Routes 9 and 125 highway bridge. In an order amending license, issued January 26, 1994, the Commission increased the project's minimum flow requirements such that bypassed reach flows vary seasonally from 50 to 300 cfs.

D. PROPOSED ACTION AND ALTERNATIVES

1. Proposed Action

The licensee proposes to install pneumatically operated, hinged crest gates over the Durham-side dam, and hinged conventionally-operated flashboards over the remainder of the dam. These facilities would allow the licensee to increase the project's normal reservoir surface elevation from 97.0 feet msl to 98.5 feet msl. This 5.2 percent increase in the project's gross head would expand the project's actual output by approximately 1.0 MW (to 19.4 MW) and its average annual generation by 4,200,000 kWh (to 84,200,000 kWh).

The licensee also requests that the existing license for the Worumbo Project be modified to allow the licensee to cycle generation periodically in order to provide reserve support to the regional power grid. This mode of operation would require the periodic fluctuation of the project's headpond between the normal elevation of 98.5 feet msl and 97.0 feet msl.

The licensee cannot specify the frequency of the periodic cycling of generation and subsequent reservoir drawdowns. They would occur when river flows are low (primarily during the summer and early fall) during weekday mornings and/or late afternoons. The small size of the project's impoundment, together with the reduction in head and, therefore, generation that would occur when the reservoir is lowered, could discourage regularly scheduled 1.5-foot drawdowns. Nevertheless, this EA evaluates these drawdowns based on the assumption that they are implemented fairly regularly on weekdays during low-flow periods.

2. Action Alternatives

There are no other action alternatives for this proposal.

3. No-Action Alternative

The no-action alternative would involve denying the requested license amendment. Under this alternative, the licensee would continue to operate the project as a run-of-river facility and to maintain the project reservoir's elevation at 97.0 feet msl.

E. CONSULTATION

AGENCY

The licensee, before filing the subject application, consulted with state and federal resource agencies and provided them with a draft application for comment.

DATE OF LETTER

The following agencies submitted comment letters to the licensee:

Maine	Department of Conservation	April	13,	1998
Maine	Inland Fisheries & Wildlife	April	15,	1998
Maine	Dept. of Environmental Protection	April	16,	1998
Maine	Historic Preservation Commission	April	17,	1998
Maine	State Planning Office	April	21,	1998
U.S. F	Fish and Wildlife Service	April	27,	1998
Maine	Department of Marine Resources	April	27.	1998

Issues and concerns raised in this correspondence are discussed in Section G of this EA.

On June 3, 1998, the Commission provided public notice of the subject application for amendment of license with a comment date of July 22, 1998.

On June 25, 1998, the Maine State Planning Office filed a motion to intervene, but did not provide any comments.

By letter dated July 23, 1998, the Department of Interior indicated that: raising the project headpond along with periodic cycling of generation would have little adverse impact on fish and wildlife resources, including the passage of migratory fish through existing fishways at the project; and existing aquatic and riparian habitats at the project, including wetlands, would be minimally affected due to the slope of the shoreline and gradient of the river bed.

F. AFFECTED ENVIRONMENT

1. General Description of the Project Area

The project is situated in a hilly, rural residential area of Southwestern Maine that includes scattered farms and commercial establishments. Lands adjacent to the reservoir, which are primarily undeveloped, consist of upland habitat with a hardwood overstory and a softwood understory.

The area's climate is characterized by moderately warm summers and cold winters. Its average annual precipitation, including the water equivalent of snow, is approximately 44 inches. In 1990, the area's population totaled 12,300 persons;

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Lewiston and Auburn, Maine, the nearest large cities, had a combined population of 64,066.

2. Geology and Soils

The project area is in the glaciated coastal lowlands of Maine. The Androscoggin River floodplain in the project area is bordered by low hills ranging from 150 to 300 feet high. Bedrock at the project is guartz-plagioclase-biotite gneiss that, in some places, has been extensively injected by pegmatites and cross-cut by basalt dikes. Unconsolidated deposits near the dam include glacial till on the northeast side of the river and ice-contact sands and gravels on the southwest side. Soils in the project area are primarily fine sandy loams and gravelly sand loams.

3. Water Quantity and Quality

The Androscoggin River flows 164 miles from its source at Umbagog Lake to tidewater at Brunswick Dam. The river drains a 3,450-square-mile area of which 80 percent lies in Maine and 20 percent in New Hampshire.

Based on flows measured at the U.S. Geological Survey gauge at Auburn, Maine, Androscoggin River flows at the Worumbo dam have ranged from 356 cfs to 142,000 cfs. The mean annual flow at the project is 6,296 cfs; the estimated 7-day average low flow that has a 1 in 10 year recurrence (7Q10) is approximately 1,680 cfs.

Flows at the Worumbo Project are controlled primarily by the operation of two upstream hydropower facilities, the Gulf Island Project, located approximately 19 miles upstream, and the Lewiston Falls Project, 14.5 miles upstream. The current operating regime at Gulf Island results in a weekly reservoir drawdown there of 2 to 4 feet and an outflow that varies from 6,450 cfs during peak periods to 1,000 cfs during off-peak periods. The Lewiston Falls Project also operates with a reservoir fluctuation of up to 4 feet per week; its releases have a similar range to those of Gulf Island. When peak outflows from Gulf Island arrive at the Worumbo Project about 6.5 hours after being released, their magnitude has diminished to approximately 4,000 cfs.

The State of Maine classifies the Androscoggin River immediately downstream of the Worumbo dam as Class C, which denotes waters suitable for: recreational boating and fishing; fish and wildlife habitat; and other uses except water contact recreation.

The State's minimum dissolved oxygen (DO) standard for Class C waters is 5 parts per million (ppm). Water quality monitoring conducted by the licensee from 1990 to 1994 determined that

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project operation has not affected DO levels in the river below the project dam. Sampling during low flow, high temperature periods revealed that DO levels there are frequently at saturation or supersaturation, well above the required Class C standard.

4. Fish Resources

The project impoundment supports populations of largemouth bass, smallmouth bass, pickerel, yellow perch, and assorted nongame species, including white sucker and spottail shiner. In addition, runs of anadromous fish, primarily American shad and alewives, utilize the project's fishways. No federally listed threatened or endangered aquatic species exist in the project area.

5. Terrestrial Resources

With the exception of the Worumbo Mill Complex at the dam, the project area is forested with red pine, white pine, hemlock, white oak, red oak, American beech, American elm, and paper birch. The shoreline of the project impoundment includes only a few small forested wetland areas. Wildlife species occurring in the project area include raccoon, striped skunk, woodchuck, squirrel, chipmunk, and songbirds.

No federally listed threatened or endangered wildlife species inhabit the project area. Moreover, the area does not contain any state-protected wildlife habitat such as high- or moderate-value habitat for waterfowl, deer wintering areas or migration corridors (letter dated April 15, 1998, from Frederick B. Hurley, Jr., Deputy Commissioner, Maine Department of Inland Fisheries and Wildlife, Augusta, Maine).

6. Land Use and Recreation

The rebuilt Worumbo Mill is situated adjacent to the project powerhouse. Most land surrounding the project reservoir is undeveloped.

In 1987, the licensee constructed a boat ramp with adjacent parking and picnic areas at the upstream end of the project reservoir. Subsequently, the licensee transferred these facilities to the Town of Lisbon.

A short distance upstream of the project dam on the Lisbon side of the river, the licensee currently maintains a seasonal floating dock and ramp to permit canceists to take out and portage the project.

Downstream of the project dam on the Lisbon side of the river, the licensee for the downstream Pejepscot Project, in

cooperation with the licensee for the Worumbo Project, constructed a bank fishing access site. Some recreational fishing also occurs on the Durham side of the river.

7. Cultural Resources

The Worumbo Mill was listed in the National Register of Historic Places (NRHP); after a fire in 1987 destroyed the building, it was removed from the list. There are no other known sites in the project area that are listed or eligible for listing in the NRHP.

G. ENVIRONMENTAL IMPACTS

1. Proposed Action

Geology and Soils

During pre-filing consultation meetings, representatives of the licensee, Maine Department of Environmental Protection (MDEP), and other resource agencies agreed that the proposed higher reservoir elevation together with periodic 1.5-foot reservoir drawdowns would cause only minimal impacts to the reservoir shoreline; however, to ensure that the new operating regime does not cause significant impacts to area soils, the licensee should monitor the reservoir shoreline for evidence of erosion.

The licensee proposes to monitor the shoreline for erosion in consultation with the resource agencies, as follows:

(1) the licensee would survey and photograph portions of the reservoir shoreline in 1998 to document existing conditions;

(2) approximately one year after implementation of the new operating regime, the licensee would conduct another survey of the reservoir shoreline to determine if erosion has occurred;

(3) if areas of significant erosion are found, the licensee would propose specific mitigative measures;

(4) the licensee would conduct shoreline monitoring for three successive years following implementation of the new operating regime; and

(5) the licensee would discontinue monitoring after that time if its surveys find no evidence of substantial shoreline erosion.

The proposed higher reservoir elevation would affect about 10 acres of additional shoreline. The existing shoreline is relatively steep and rocky with stable soils. Consequently, we

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concur with the agencies that the proposed operating regime and the increase in reservoir level will unlikely cause significant erosion of the reservoir shoreline. However, to ensure that adverse impacts do not occur, the licensee should be required to implement its proposed shoreline monitoring program.

Water Ouantity

During high-flow periods and on weekends, the project would continue to operate as a run-of-river facility; consequently, outflow from the project would remain unchanged from current levels. On weekdays during low flow periods, the project could operate in a peaking mode in the morning and late afternoon, thereby causing downstream releases to vary from about 9,600 cfs during periods of peak demand to 1,700 cfs during periods of offpeak demand (that is, when the reservoir is refilled).

The proposed reservoir drawdowns would: (1) reregulate some of the existing peaking flows in the lower Androscoggin River produced by Central Maine Power Company's Gulf Island Development (FERC Project No. 2283, located at River Mile 26.4) and Lewiston Falls Project (FERC Project No. 2302, located at River Mile 22.8); and (2) enable the Worumbo Project to increase its generation during periods of peak electrical loads (6:00 a.m. to 9:00 a.m. and 4:00 p.m. to 7:00 p.m. from Monday through Friday).

During an average water year, inflows to the Worumbo Project in the month of July have increased to about 4,000 cfs by early afternoon. Thus, even with a required discharge of 1,700 cfs, the project reservoir could be refilled within 1.5 hours, in time for the evening peak-load period.

Water Quality

On July 13, 1998, the Maine Department of Environmental Protection issued Water Quality Certification for the proposed license amendment.

Reservoirs of hydroelectric projects may impact DO levels and water temperature by retaining water long enough to stratify. A stratified reservoir with a deep water release may discharge flows low in DO; a stratified reservoir that discharges from its higher elevations may release water with relatively high temperatures.

As a result of high inflows and relatively shallow reservoir, the Worumbo Project reservoir currently does not stratify during the summer months. The proposed action would raise the reservoir's maximum surface elevation by 1.5 feet or 5.2 percent. The proposed peaking operation, however, would not allow this increase in elevation to obtain a "static" state that could contribute to the reservoir becoming stratified.

Consequently, the reservoir would not stratify and downstream water quality would remain unaffected.

Fisheries Resources

Raising the project headpond by 1.5 feet would inundate a small amount of existing riffle/run habitat at the upstream end of the impoundment. Maine Department of Inland Fisheries and Wildlife (DIFW) concludes that this effect would have only a minor impact on the reservoir's suitability for salmonid management purposes. Further, DIFW and the U.S. Fish and Wildlife Service indicate that the proposed 1.5-foot headpond elevation change, and periodic fluctuation within that range, would not affect the quantity of adult habitat nor the spawning success of warmwater species in the reservoir (letter dated April 15, 1998, from Frederick B. Hurley, Jr., Deputy Commissioner, Augusta, Maine; letter dated July 23, 1998, from Andrew L. Raddant, Regional Environmental Officer, Department of the Interior, Office of the Secretary, Boston, Massachusetts). We concur with these findings.

The headwaters of the Pejebscot Project extend to the tailwaters of the Worumbo Project. By providing a 1,700 cfs project discharge during refill periods, the licensee would minimize any potential impacts caused by fluctuating releases at Worumbo on fish resources located in the downstream reservoir.

The existing upstream fish lift and the downstream fishway at the project are able to operate effectively when the elevation of the project reservoir is between 97.0 and 98.5 feet msl. The proposed increase in reservoir elevation, therefore, would not affect fish passage at the project. Also, during upstream fish migration in the spring, high project inflows will obviate the need for reservoir drawdowns; therefore, daily discharges will not vary significantly, and no adverse impacts would occur to migratory species.

Based on our evaluation, we conclude that mitigation for fisheries impacts is not required.

Terrestrial Resources

Activities associated with the installation of crest gates and flashboards at the Worumbo dam would result in the temporary disturbance or displacement of small mammals and birds. This unavoidable impact would not be significant.

The project reservoir elevation historically was operated at a normal elevation of 98 to 99 feet msl, with one to two feet of spill over the spillway crest elevation. Our review of National Wetlands Inventory Mapping for the project area indicates that

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the existing reservoir shoreline supports only a few small areas of forested wetlands.

The Department of Interior's letter dated July 23, 1998, concludes that: "existing aquatic and reparian habitats at the project, including wetlands, are also likely to be minimally affected due to the slope of the shoreline and gradient of the river bed."

Consequently, we conclude that the proposed operating regime would have only minor impacts to the minimal amount of wetlands and other vegetation in the project area, and there is no need to require the licensee to implement mitigative measures for wetlands or other terrestrial resources.

Land Use and Recreation

Boaters on the Sabattus River traveling to the Androscoggin River pass under a railroad bridge that currently provides an underclearance of approximately 7 feet. The proposed higher reservoir elevation would reduce this clearance to 5.5 feet. The licensee concludes that this amount would be adequate for public safety. The agencies concur with this assessment.

During periods of very high river flows, clearance could be reduced even further. To warn boaters of the potential danger at the railroad bridge, the licensee proposes to post a warning sign at the Town of Lisbon's existing boat launch on the Sabattus River.

We agree that placing a sign at the Town's boat launch represents an appropriate precautionary measure. In addition, we conclude that there is a need for signing at the railroad bridge to warn boaters of the reduced (5.5-foot) clearance there during normal river flows. Thus, the licensee, in consultation with the Maine State Department of Conservation and the Town of Lisbon, should be required to install appropriate warning signs at both the Town's boat launch and at the railroad bridge, prior to increasing the reservoir elevation.

Cultural Resources

The State Historic Preservation Officer notified the licensee that the proposed operating regime would not exacerbate erosion of any archeological sites located above the pool elevation; consequently, the proposed undertaking would not affect properties of historic, architectural or archaeological significance (letter dated April 17, 1998 from Earle G. Shettleworth, Jr., Maine Historic Preservation Commission, Augusta, Maine).

2. No-Action Alternative

Under the no-action alternative, the licensee would not increase the normal elevation of the project reservoir, and would continue to operate the project as a run-of-river facility. Consequently, this alternative would not produce any impacts to the area's environmental resources.

H. CONCLUSIONS AND RECOMMENDATIONS

In our review of the project, we did not identify any significant impacts that would result from approving the proposed license amendment. We conclude that approval of the subject amendment of license would not constitute a major federal action significantly affecting the quality of the human environment.

I. LITERATURE CITED OR REVIEWED

Federal Energy Regulatory Commission. December 9, 1985. Environmental Assessment for the Worumbo Project, FERC No. 3428-001-Maine.

Federal Energy Regulatory Commission. December 24, 1985. Order Issuing Major License for the Worumbo Project, No. 3428-001.

Federal Energy Regulatory Commission. July 1996. Final Environmental Impact Statement: Lower Androscoggin River Basin Hydroelectric Projects in Maine, Report No. 0100. Washington, DC.

Miller Hydro Group, Incorporated. May 15, 1998. Application for Amendment of License-Worumbo Hydroelectric Project, No. 3428-080-Maine.

Prepared by:

Jim Haimes - FERC Staff Environmental Protection Specialist. Sean Murphy - FERC Staff Fisheries Biologist.

APPENDIX D

THREATENED AND ENDANGERED SPECIES



United States Department of the Interior

FISH AND WILDLIFE SERVICE Maine Ecological Services Field Office P. O. Box A East Orland, ME 04431 Phone: (207) 469-7300 Fax: (207) 902-1588 http://www.fws.gov/mainefieldoffice/index.html



In Reply Refer To: October 29, 2017 Consultation Code: 05E1ME00-2018-SLI-0070 Event Code: 05E1ME00-2018-E-00162 Project Name: Worumbo Hydroelectric Project (FERC No. 3428) Re-certification LIHI Project

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 the threatened, endangered, candidate, and proposed species and designated or proposed critical habitat that may occur within the boundary of your proposed project or may be affected by your proposed project. This 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 Web site 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 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 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

This species list also identifies candidate species under review for listing and those species that the Service considers species of concern. Candidate species have no protection under the Act but are included for consideration because they could be listed prior to completion of your project. Species of concern are those taxa whose conservation status is of concern to the Service (i.e., species previously known as Category 2 candidates), but for which further information is needed.

If a proposed project may affect only candidate species or species of concern, you are not required to prepare a Biological Assessment or biological evaluation or to consult with the Service. However, the Service recommends minimizing effects to these species to prevent future conflicts. Therefore, if early evaluation indicates that a project will affect a candidate species or species of concern, you may wish to request technical assistance from this office to identify appropriate minimization measures.

Please be aware that bald and golden eagles are not protected under the Endangered Species Act but are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may require development of an eagle conservation plan: <u>http://www.fws.gov/windenergy/eagle_guidance.html</u> Information on the location of bald eagle nests in Maine can be found on the Maine Field Office Web site: <u>http://www.fws.gov/mainefieldoffice/Project% 20review4.html</u>

Additionally, wind energy projects should follow the wind energy guidelines: <u>http://www.fws.gov/windenergy/</u> for minimizing impacts to migratory birds and bats. Projects may require development of an avian and bat protection plan.

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. 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 and at: http://www.towerkill.com; and at: 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:

Maine Ecological Services Field Office P. O. Box A East Orland, ME 04431 (207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2018-SLI-0070 Event Code: 05E1ME00-2018-E-00162 Project Name: Worumbo Hydroelectric Project (FERC No. 3428) Re-certification LIHI Project **Project Type:** DAM Project Description: The Project is going through re-certification from LIHI. The project is located in Lisbon, Maine. The Miller Hydro Group's (MHG) Worumbo Hydroelectric Project (Project), FERC-3428, is located on the Androscoggin River at river mile 8 (RM), in Lisbon Falls and Durham, Maine. The Worumbo Project is the third dam on the Androscoggin River, upstream from the Brunswick Hydroelectric Project (FERC-2284) and the Pejepscot Hydroelectric Project (FERC-4784). Other FERC regulated hydro projects above Worumbo are Rumford Falls (FERC-2333) in Rumford, Maine, the Riley-Jay Livermore sites (FERC-2375) in Riley/Jay/Livermore, Maine, Otis (FERC-8277) in Chisholm, Maine, Gulf Island - Deer Rips (FERC-2283) in Lewiston, Maine, Lewiston Falls (FERC- 2302) in Lewiston, Maine and Upper Androscoggin (FERC-11006) in Lewiston, Maine.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/43.996198943574484N70.07111831172787W



Counties:

Androscoggin, ME

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. 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.

Mammals

NAMESTATUSNorthern Long-eared Bat Myotis septentrionalis
No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9045ThreatenedFishesFishesSTATUSNAMESTATUSAtlantic Salmon Salmo salar
Population: Gulf of Maine DPS
There is final critical habitat for this species. Your location overlaps the critical habitat.Endangered

Species profile: https://ecos.fws.gov/ecp/species/2097

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME Atlantic Salmon Salmo salar https://ecos.fws.gov/ecp/species/2097#crithab STATUS

Final
From:	<u>St.Hilaire, Lisa</u>
To:	Kayla Easler
Subject:	RE: Worumbo LIHI Recertification Review Request
Date:	Wednesday, November 15, 2017 2:34:19 PM
Attachments:	image001.png
	kleinschmidt lisbon-durham worumbo.pdf

Hi Kayla,

MNAP comments attached, thanks,

Lisa St. Hilaire

Information Manager | Maine Natural Areas Program Department of Agriculture, Conservation and Forestry 93 State House Station | Augusta, ME 04333 **PHONE 207-287-8044** | FAX 207-287-8040

From: Kayla Easler [mailto:Kayla.Easler@KleinschmidtGroup.com]
Sent: Monday, November 13, 2017 9:38 AM
To: St.Hilaire, Lisa <Lisa.St.Hilaire@maine.gov>
Cc: Andy Qua <Andy.Qua@KleinschmidtGroup.com>
Subject: Worumbo LIHI Recertification Review Request

Good morning Lisa,

I am requesting information regarding State of Maine listed rare or special status species or habitat that may occur within the project area of the existing Worumbo Hydroelectric Project (FERC No. 3428). Please find the request letter attached to this email. If you have any questions please let me know.

Thank you,

Kayla A. Easler Regulatory Coordinator **Kleinschmidt** Direct: (207) 416-1271 www.KleinschmidtGroup.com Providing **practical** solutions for **complex** problems affecting energy, water, and the environment



PAUL R. LEPAGE GOVERNOR STATE OF MAINE DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY 93 STATE HOUSE STATION

93 STATE HOUSE STA AUGUSTA, MAINE 04333

WALTER E. WHITCOMB COMMISSIONER

November 14, 2017

Kayla Easler Kleinschmidt Associates 141 Main St Pittsfield, ME 04967

Via email: kayla.easler@kleinschmidtgroup.com

Re: Rare and exemplary botanical features in proximity to: Project 1871099.01, FERC No. 3428, Worumbo Hydroelectric Project Relicensing, Durham and Lisbon, Maine

Dear Ms. Easler:

I have searched the Natural Areas Program's Biological and Conservation Data System files in response to your request received November 14, 2017 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Durham and Lisbon, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

MOLLY DOCHERTY, DIRECTOR MAINE NATURAL AREAS PROGRAM



PHONE: (207) 287-8044 Fax: (207) 287-8040 WWW.MAINE.GOV/DACF/MNAP Letter to Kleinschmidt Comments RE: Worumbo Hydro November 14, 2017 Page 2 of 2

The Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. The Natural Areas Program welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by the Natural Areas Program are to be published in any form, the Program should be informed at the outset and credited as the source.

The Natural Areas Program has instituted a fee structure of \$75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for \$150.00 for two hours of our services.

Thank you for using the Natural Areas Program in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

Krit Ping

Kristen Puryear | Ecologist | Maine Natural Areas Program 207-287-8043 | <u>kristen.puryear@maine.gov</u>

Rare and Exemplary Botanical Features within 4 miles of Project: #11871099.01, FERC No. 3428, Worumbo Hydroelectric Relicense, Durham-Lisbon, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Climbing Hempwe	ed					
	PE	SH	G5	1916-08	1	Dry barrens (partly forested, upland),Open wetland, not coastal nor rivershore (non-forested, wetland)
Clothed Sedge						
	Е	S1	G5	1898-06-15	1	Dry barrens (partly forested, upland)
Dry Land Sedge						
	\mathbf{SC}	S2	G5	2007-10-14	13	Old field/roadside (non-forested, wetland or upland)
Great Blue Lobelia	a					
	\mathbf{PE}	SX	G5	1900	2	Forested wetland,Non-tidal rivershore (non-forested, seasonally wet)
Mountain Honeysı	ıckle					
	Е	S2	G5	1933-09	4	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
Narrow-leaf Arrow	vhead					
	\mathbf{SC}	S2	G4G5	2000-09-14	1	<null></null>
Sassafras						
	\mathbf{SC}	S2	G5	1906	10	Hardwood to mixed forest (forest, upland),Old field/roadside (non-forested, wetland or upland)
Showy Lady's-slip	per					
	SC	S3	G4	1907-07-09	38	Forested wetland,Open wetland, not coastal nor rivershore (non-forested, wetland)
Smooth Winterber	ry Holly					
	\mathbf{SC}	S3	G5	1989	22	Forested wetland
Unicorn Root						
	PE	SX	G5	1884	1	Dry barrens (partly forested, upland)
Narrow-leaf Arrow Sassafras Showy Lady's-slipp Smooth Winterber Unicorn Root	vhead SC SC sC per SC ry Holly SC PE	S2 S2 S3 S3 SX	G4G5 G5 G5 G5 G5	1990-09-14 1906 1907-07-09 1989 1884	1 10 38 22 1	Sty barrens (party forested, upfalld), flatdwood to finked forest (forest, upland) <null> Hardwood to mixed forest (forest, upland), Old field/roadside (non-forested, wetland or upland) Forested wetland, Open wetland, not coastal nor rivershore (non-forested, wetland) Forested wetland Forested wetland Dry barrens (partly forested, upland)</null>

Maine Natural Areas Program

Page 1 of 1

www.maine.gov/dacf/mnap

STATE RARITY RANKS

- **S1** Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
- **S2** Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- **S3** Rare in Maine (20-100 occurrences).
- S4 Apparently secure in Maine.
- **S5** Demonstrably secure in Maine.
- SU Under consideration for assigning rarity status; more information needed on threats or distribution.
- **SNR** Not yet ranked.
- **SNA** Rank not applicable.
- **S#?** Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).
- **Note:** State Rarity Ranks are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines State Rarity Ranks for animals.

GLOBAL RARITY RANKS

- G1 Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.
- **G2** Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- G3 Globally rare (20-100 occurrences).
- G4 Apparently secure globally.
- G5 Demonstrably secure globally.
- **GNR** Not yet ranked.
- Note: Global Ranks are determined by NatureServe.

STATE LEGAL STATUS

- **Note:** State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered** and **Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.
- **E** ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
- **T** THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

NON-LEGAL STATUS

- **SC** SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
- **PE** Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

Visit our website for more information on rare, threatened, and endangered species! http://www.maine.gov/dacf/mnap

ELEMENT OCCURRENCE RANKS - EO RANKS

Element Occurrence ranks are used to describe the quality of a rare plant population or natural community based on three factors:

- <u>Size</u>: Size of community or population relative to other known examples in Maine. Community or population's viability, capability to maintain itself.
- <u>Condition</u>: For communities, condition includes presence of representative species, maturity of species, and evidence of human-caused disturbance. For plants, factors include species vigor and evidence of human-caused disturbance.
- **Landscape context**: Land uses and/or condition of natural communities surrounding the observed area. Ability of the observed community or population to be protected from effects of adjacent land uses.

These three factors are combined into an overall ranking of the feature of **A**, **B**, **C**, or **D**, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

Note: Element Occurrence Ranks are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines Element Occurrence ranks for animals.

Visit our website for more information on rare, threatened, and endangered species! http://www.maine.gov/dacf/mnap

From:	Perry, John
To:	Kayla Easler
Cc:	Pellerin, James; Lindsay, Scott
Subject:	RE: Worumbo Hydroelectric species request
Date:	Tuesday, December 12, 2017 3:04:52 PM
Attachments:	image002.png
	image003.png

Hi Kayla,

For fisheries, the following assemblage has been documented in the Androscoggin River drainage:

Sea run alewife American eel American shad Atlantic salmon Black crappie Bluegill sunfish Brook trout Brown bullhead Brown trout Burbot Chain pickerel Common carp Common shiner Creek chub Banded killifish Blacknose dace Fallfish Four spine stickleback Golden shiner Lake chub Landlocked salmon Largemouth bass Longnose dace Longnose sucker Northern pike Pumpkinseed sunfish Rainbow trout Red breast sunfish Rock bass Sea lamprey Slimy sculpin Smallmouth bass Spottail shiner Striped bass White catfish

White perch White sucker Yellow perch Tessellated darter

For known RTE wildlife species:

<u>Bats</u>

While a comprehensive statewide inventory for bats has not been completed, it is likely that several of these species occur within the project area during migration and/or the breeding season:

Little brown bat (State Endangered) Northern long-eared bat (State Endangered) Eastern small-footed bat (State Threatened) Big brown bat (Special Concern) Red bat (Special Concern) Hoary bat (Special Concern) Silver-haired bat (Special Concern) Tri-colored bat (Special Concern)

Creeper (Special Concern mussel)

Otherwise, MDIFW databases do not indicate the presence of other State-listed Endangered, Threatened, or Special Concern Species in the Project area; however, to our knowledge no formal surveys have been conducted. That said, it is possible (likely) that several other rare species may be resident or transient at the Project area based on location, habitats present, and life history requirements including great blue heron (Special Concern) and wood turtles (Special Concern). It is also possible that one or more rare species of migratory birds may be found in the area during spring and fall migrations. Therefore, the list above should not be considered all-inclusive.

Wildlife Habitats

At this time, MDIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of SWHs within the project area, which include Waterfowl and Wading Bird Habitats, Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed so it is possible that this habitat could occur within the project area.

I hope this helps—please let me know if you need additional information.

John

John Perry

Environmental Review Coordinator Maine Department of Inland Fisheries and Wildlife 284 State Street, 41 SHS Augusta, Maine 04333-0041 Tel (207) 287-5254; Cell (207) 446-5145 Fax (207) 287-6395 www.mefishwildlife.com



Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.

From: Kayla Easler [mailto:Kayla.Easler@KleinschmidtGroup.com]
Sent: Tuesday, December 12, 2017 8:19 AM
To: Pellerin, James <James.Pellerin@maine.gov>; Lindsay, Scott <Scott.Lindsay@maine.gov>
Cc: Perry, John <John.Perry@maine.gov>
Subject: RE: Worumbo Hydroelectric species request

Good morning,

I am inquiring on the status of our request on December 4th?

Please let me know if there is additional information that you may need.

Thank you,

Kayla A. Easler Regulatory Coordinator **Kleinschmidt** Direct: (207) 416-1271 www.KleinschmidtGroup.com Providing **practical** solutions for **complex** problems affecting energy, water, and the environment

From: Kayla Easler Sent: Monday, December 04, 2017 3:34 PM To: 'James.Pellerin@maine.gov' <James.Pellerin@maine.gov>; 'Scott.Lindsay@maine.gov'
 <<u>Scott.Lindsay@maine.gov</u>>
 Cc: 'john.perry@maine.gov' <<u>john.perry@maine.gov</u>>
 Subject: Worumbo Hydroelectric species request

Good afternoon,

I am requesting information regarding State of Maine rare, threatened, endangered or special status species or habitat that may occur within the project area of the existing Worumbo Hydroelectric Project (FERC No. 3428).

Attached is a copy of the MNAP request letter for the Project, with map of the zones of effect.

If you have any questions please let me know.

Thanks,

Kayla A. Easler Regulatory Coordinator Kleinschmidt Direct: (207) 416-1271 www.KleinschmidtGroup.com Providing practical solutions for complex problems affecting energy, water, and the environment

APPENDIX E

CULTURAL RESOURCES

RECEIVED ARR 2 3 1998



Earle G. Shettleworth, Jr. Director MAINE HISTORIC PRESERVATION COMMISSION 55 Capitol Street 65 State House Station Augusta, Maine 04333

Telephone: 207-287-2132

April 17, 1998

Mr. Mark Issacson, Vice President Miller Hydro Group P. O. Box 97 Lisbon Falls, Maine 04252-0097

Dear Mr. Isaacson:

In response to your recent request, I have reviewed your draft application for amendment of the Worumbo Hydroelectric Project, FERC Project #3428-Maine.

Although there are or may be properties in the project area of historic, architectural, or archaeological significance as defined by the National Historic Preservation Act of 1966, I find that the proposed undertaking will have no effect upon such properties, in that the proposed pool operation between 98.5 and 97.0 feet, which is less than the historic operating maximum of 99.0 feet, will not exacerbate erosion of any archaeological sites located above the pool elevation.

If I can be of further assistance concerning this matter, please do not hesitate to let me know.

Sincerely,

Earle G. Shettleworth, Jr. Constant State Historic Preservation Officer

APPENDIX F

MINIMUM FLOW

Exhibit A – Flows

On December 30, 1991, Miller Hydro Group, following consultation and negotiation with the Resource Agencies, filed with the Federal Energy Regulatory Commission (FERC) the results of an instream flow study and recommendations for a minimum flow plan based on that study. The plan included a seasonal flow schedule, and offsite mitigation in the form of an annual payment to the Maine Department of Inland Fisheries & Wildlife for a fisheries management program in the Lower Androscoggin River Basin. On January 26, 1994, the FERC issued the attached "Order Approving and Modifying Minimum Flow Releases and Amending License", which contained the joint recommendations of the Licensee and the participating Resource Agencies. Copies of the 1991 comment letters from the U. S. Fish & Wildlife Service, the Maine Department of Marine Resources, the Maine Department of Inland Fisheries & Wildlife, and the Atlantic Sea Run Salmon Commission. Copies of these letters are attached as part of this exhibit.

This plan was again subject to agency review and request for modification in conjunction with the 1998 license amendment request. No modifications were requested at that time and the license amendment was issued upon the same terms as the flow plan approved in 1994. Comments relating to flows were received from the following Resource Agencies:

Maine Department of Inland Fisheries & Wildlife, April 15, 1998 Maine Department of Environmental Protection, April 16, 1998 U. S. Fish & Wildlife Service, April 27, 1998 Maine Department of Marine Resources, April 27, 1998

Copies of these letters are attached as part of this exhibit.

PYI Kesi

UNITED STATES OF AMERICA 66 FERC 62, 041 FEDERAL ENERGY REGULATORY COMMISSION

Miller Hydro Group, Inc.

Project No. 3428-029--Maine

ORDER APPROVING AND MODIFYING MINIMUM FLOW RELEASE PLAN AND AMENDING LICENSE (ISSUED JANUARY 26, 1994)

On December 30, 1991, the Miller Hydro Group, licensee for the Worumbo Project (FERC No. 3428) filed the results of an instream flow study and, based on study results, recommendations for changing the project's minimum flow requirement. The filing was supplemented by a letter filed January 8, 1992. The filing of this information was required by article 32 of the project license. 1

Article 32 stipulates, in part, that the licensee study the relationship of various minimum flow releases, including the interim minimum flow specified by article 31, 2 to fish habitat in the 850-foot-long bypass reach of the Androscoggin River between the Worumbo Dam and the powerhouse. Article 32 further states that the licensee shall conduct the study as approved by the Commission and file a report, and any recommendations for continuation or modifications of minimum flow releases as deemed necessary.

The study plan was filed on June 2, 1987 and approved by the Commission on August 5, 1987. 3 Following consultation with the agencies, the licensee made habitat improvements below the dam in 1989 and 1990, prior to conducting the study. The study was conducted jointly by the licensee and the agencies in August and September 1990. Following compliant ion of the study and analysis of the results, the licensee and agencies engaged in extensive consultations and negotiations concerning the appropriate flows, including seasonal flows. The licensee's proposal, as described below, represents a negotiated agreement expressing the joint recommendations of the licensee and resource agencies.

1 33 FERC 62,430 (1985)

2 For the protection of fish resources, article 31 requires, in part, that the licensee discharge a minimum flow of 25 cubic feet per second (cfs) as measured immediately downstream of the dam.

3 40 E RC 62,128 (1987)

Study Results

The bypass reach was divided into five sections, and habitat within each section was evaluated at flows of 25, 100, 200, 300, and 400 cfs using a study team Delphi consensus method. Using this method, a team of expert observers viewed each flow level and collectively rated habitat suitability for the species and life stages of concern. Group consensus was reached using numerical rating scales derived from accepted Suitability Index (SI) curves or word models for specific habitat parameters and fishing opportunity.

The species and life stages of interest were adult brown trout, adult smallmouth bass, and juvenile Atlantic salmon. The effect of flows on fishing opportunities was also considered. The study showed, in summary, that a flow of 300 cfs maximizes the amount of habitat for the species/life stages of concern. Fishing opportunities were determined to be greater at the higher flows.

Recommendations

Based on the results of the study and consultations and negotiations conducted during meetings held on January 9, February 6, May 2, and October 1, 1991, the licensee proposes the following six measures relative to minimum flow releases.

(1) Release in imum flows at the project according to the following scheme.

September 1 - October	31	200	cfs	
November 1 - November	30	50	cfs	4
December 1 - April 15	• .	50	cfs	
April 16 - May 31		300	cfs	
June 1 - June 30		200	cfs	
July 1 through Aul.st	31	100	cfs	

(2) Provide funding of \$25,000 per year for the remainder of license term (i.e., until the year 2025) to the Maine Department of Inland Fisheries and Wildlife (DIFW) for a fisheries management program in the lower Androscoggin River basin. This amount will be increased or decreased, as appropriate, by the Consumers Price Index (CPI) for the previous year.

4 Unless the downstream fishway is operational, in which case 85 cfs.

(3) The DIFW will be the lead agency to act as the resource agency contact, with sole authority to permit exception to the proposed bypass flows.

(4) The licensee will modify the dam spillway as necessary to concentrate bypass flows over the crib (i.e., west) side of the dam.

(5) The licensee may deviate from the proposed bypass flows without penalty under any of the following conditions:

- A. operating emergencies;
- B. by order of any jurisdictional government agency; and
- C. as authorized in advance by the DIFW.

(6) In addition, the licensee may undershoot the proposed minimum flow up to 50 percent for periods not to exceed one hour, provided that only one such underrelease may be made in a 24-hour period without authorization from the DIFW.

Agency Comments

The licensee consulted with the DIFW, the Maine Department of Marine Resources (DMR), the Atlantic Sea Run Salmon Commission (ASRSC), and the U.S. Fish and Wildlife Service (USFWS), in the development and implementation of the study, and in the interpretation of study results. This consultation was documented in letters and in minutes of meetings held to discuss study results and to develop flow recommendations.

In general, the DMR deferred comments to the DIFW, since the target species were the jurisdiction of the latter agency. The ASRSC's participation was limited due to lack of personnel resources. By letter dated December 3, 1991, the ASRSC indicated general agreement with the licensee's proposed measures, but stated that two "minor issues" needed to be resolved. However in a second letter, dated December 27, 1991, the ASRSC provided clarification of its December 3, 1991 letter and stated that the proposed measures should provide the opportunity to accommodate all the fishery management goals and objectives on the lower river.

The DIFW and the FWS were intimately involved in the development and implementation of the study, the interpretation of study results, and the development and negotiation of flow recommendations. Consequently, the proposed measures reflect the inputs of these agencies. Agency recommendations included into the proposed measures include designation of the DIFW as the lead agency to act as the resource agency contact and the provision of off-site mitigation, implemented through the licensee's funding of the agency-developed fisheries management plan. The DIFW and the FWS expressed concurrence with the proposed measures by letters dated December 4, 1991 and December 10, 1991, respectively.

Discussion

The instream flow study indicated that a flow of 300 cfs maximized the amount of quality habitat available in the 850foot-long bypass reach between the Worumbo Dam and the project's powerhouse. While the licensee agreed that 300 cfs would be desirable at certain times of the year, corresponding to specific needs, the licensee felt that the need for higher flows during other times of the year (e.g., winter) was not well documented. The licensee argued that the year-round release of 300 cfs would seriously impact project economics.

After extensive negotiations, all parties agreed that other off-site mitigation could compensate for loss of habitat resulting from a flow regime whereby less than the optimum amount of habitat was present during some periods of the year. This mitigation would be funded by the licensee's annual payments of \$25,000 to the DIFW.

The proposed measures reflect a compromise wherein the licensee's proposed flow regime would serve to provide optimum habitat at those times when a need has been identified. While the proposed releases provide less habitat at other times of the year, this loss is offset through the funding of off-site mitigation to be directed at identified problems.

However, the licensee's proposed measures do not include a description of how the licensee proposes to measure the minimum flow releases or a schedule for reporting any deviations from the specified flows. Because the licensee does not currently measure project inflows or outflows, it will be probably be necessary to install stream gaging equipment in the bypass reach in order to measure and document compliance with the required minimum flow releases. Consequently, the licensee's proposal should be modified to state that the licensee will develop and file, for Commission approval, a plan for measuring and reporting minimum flow releases in the bypass reach. The plan should be developed in consultation with the DIFW. Although the proposed minimum flows will be effective as of the issuance of this order, the licensee should be granted a reasonable period of time, ninety days, to develop and file the gaging plan.

Additionally, the proposed plan contains no provisions for reporting the mit.; ative measures undertaken by the DIFW with the \$25,000 annual payments. To ensure that appropriate measures are being undertaken, the licensee should consult with the DIFW and file annual reports, by March 1 each year, describing the measures implemented during the previous year. The Commission should reserve the right to modify the procedures for identifying and implementing the mitigative measures to be funded with the \$25,000 annual payments, should the reports indicate that such changes would serve to better protect and enhance the fishery resources of the Androscoggin River.

In summary, the licensee's proposed flow regime and related measures, modified as described above, would serve to protect and enhance fisheries resources in the project area. Consequently, the proposed measures, as modified, should be approved.

The Director orders:

(A) The licensee's recommendations for minimum flow releases, filed on December 31, 1991, as modified in paragraphs(C) and (E), below, are approved.

(B) Article 31 is hereby amended to read as follows:

Article 31. For the protection and enhancement of fisheries resources, the licensee shall discharge from the Worumbo Dam Release minimum flows, as measured immediately downstream from the dam, according to the following schedule.

September 1 - October	31	200	cfs
November 1 - November	30	50	cfs 5
December 1 - April 15		50	cfs
April 16 - May 31		300	cfs
June 1 - June 30	• .	200	cfs
July 1 through August	31	100	cfs

These minimum flows may be temporarily modified if required by operating emergencies or by order of any jurisdictional government agency, or as authorized in advance by the DIFW. Further, the licensee may undershoot the stated minimum flow up to 50 percent for a period not to exceed one hour, provided that only one such underrelease may be made in a 24-hour period without authorization from the DIFW.

5 Unless the downstream fishway is operational, in which case 85 cfs.

(C) Within 90 days from the date of issuance of this order, the licensee shall file, for Commission approval, a plan for measuring and documenting compliance with the minimum flow releases required in (B), above, and for reporting any deviations from the scheduled flows.

The gaging plan shall be developed in consultation with the DIFW. The developed plan shall contain documentation of consultation with the DIFW. Upon approval of the plan by the Commission, the licensee shall implement the plan, including any changes ordered by the Commission.

(D) The licensee shall provide funding in the amount of \$25,000 per year for the remainder of license term to the Maine Department of Inland Fisheries and Wildlife (DIFW) for mitigative measures to be implemented through a fisheries management program in the lower Androscoggin River basin. This amount will be increased or decreased, as appropriate, by the Consumers Price Index (CPI) for the previous year.

(E) The licensee shall consult with the DIFW and file annual reports, by March 1 each year, describing the mitigative measures implemented during the previous year with the \$25,000 annual payments. The Commission reserves the right to modify the procedures for identifying and implementing the mitigative measures to be funded with the \$25,000 annual payments, should the reports indicate that such changes would serve to better protect and enhance the fishery resources of the lower Androscoggin River basin.

(F) 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



United States Department of the Interior

RECENTED DEG 1 2 1881

FISH AND WILDLIFE SERVICE 400 RALPH PILL MARKETPLACE 22 BRIDGE STREET CONCORD, NEW HAMPSHIRE 03301-4901

December 10, 1991

REF: FERC #3428

Mr. Mark Isaacson Miller Hydro Group P.O. Box 97 Lisbon Falls, Maine 04252

Dear Mr. Isaacson:

We concur with the minimum flows for the bypassed reach at the Worumbo Hydroelectric Project that are proposed in your memorandum, dated November 20, 1991. As demonstrated in your instream studies, the recommended flows will protect and enhance aquatic resources below the dam during times of peak fishing activity in the spring.

We had originally recommended that the peak habitat flows (300 cfs) be maintained throughout the year. Your current proposal calls for discharges below 300 cfs outside of the spring months. Although we believe that this will likely result in reduced use by fish and other aquatic resources in the bypassed reach, we would support off-site mitigation as a means of compensating for unavoidable losses. When combined with the proposed releases at the dam, these off-site measures should ensure that fish and other aquatic resources receive equitable treatment.

As discussed in your October 1, 1991 meeting with the natural resource agencies, we believe that the Maine Department of Inland Fisheries and Wildlife (MDIFW) would be best suited to carry out any off-site mitigation for impacts at Worumbo in conjunction with their regular fishery management activities on the lower Androscoggin River. This will require continuous funding in order to ensure that the mitigation is accomplished and maintained. Therefore, your proposed annual payment to MDIFW of \$25,000 (with adjustment for inflation) throughout the remainder of your license term (i.e., until November 25, 2025) is appropriate.

Your filing to the FERC on bypass flows at Worumbo will reflect a need to include off-site mitigation in addition to discharges at the dam if longterm fishery management objectives for the lower Androscoggin River are to be accomplished. We ask that you stress this point in your filing, and include the agencies in any subsequent negotiations with FERC regarding this matter. We have no objection to the other conditions mentioned in your memorandum, including those dealing with agency contact and compliance monitoring. If you have any questions regarding these comments, please contact Gordon Russell at (207) 827-5938.

Sincerely yours,

rdent. Beckett

Gordon E. Beckett Supervisor New England Field Offices

cc: RO/FWE-Reading File ME Anad. Fish Coord. FERC, NYRO FERC, Wash., D.C. (OHL/DPCA) ME DEP, Augusta (Dana Murch) ME IFW, Augusta ME DMR, Augusta ME ASRSC, Bangor OEA, T. Martin FWE:GRussell:12-10-91:(207)827-5938

erceireddes 13 1003



John R. McKernan, Jr. Governor

William J. Brennan Commissioner

DEPARTMENT OF MARINE RESOURCES

Telephone (207) 289-6550 FAX (207) 289-5758

December 5, 1991

Mark Isaacson, Vice President MILLER HYDRO GROUP PO Box 97 Lisbon Falls, ME 04252

Re: Worumbo Hydro, FERC #3428 Bypass Flow Agreement

Dear Mr. Isaacson:

This is in response to your request for our concurrence with a bypass flow agreement as outlined in your memo of November 20, 1991, to fishery agency staff of ASRSC, USFWS, IF&W, and DMR. We have determined that the primary species of concern in the Worumbo bypass reach are resident freshwater species and anadromous salmonids. Therefore, we defer to the Department of Inland Fisheries and Wildlife and the Atlantic Salmon Commission on the issue of appropriate minimum bypass flows. We will continue to be actively involved in addressing fish passage needs at the Worumbo Project, including the possibility of future fish passage at the spillway adjacent to the bypass reach. On the issue of bypass flows, we feel that the Department of Inland Fisheries and Wildlife should be the lead contact agency with authority to permit exception to the bypass flow conditions specified.

Thank you for the opportunity to comment on the proposed bypass flow agreement. If you need further information or clarification, please contact Lewis Flagg at 289-5275.

Sin J. BRENNAN TATAM

COMMISSIONER

WJB/jcw cc: Lew Flagg, DMR Steve Timpano, IFW Gordon Russell, USFWS Ed Baum, ASRSC Dana Murch, DEP



NECRATED DEC 6 -

John R. McKernan, Jr. Governor William J. Vail Commissioner

DEPARTMENT OF INLAND FISHERIES AND WILDLIFE

Telephone (207) 289-3371

December 4, 1991

Mark Isaacson Miller Hydro Group P.O. Box 97 Lisbon Falls, ME 04252

RE: Worumbo Hydroelectric Project FERC No. 3428 Worumbo Bypass Flows

Dear Mr. Isaacson:

We have reviewed your memorandum to the agencies, dated November 20, 1991, which outlines the tentative agreement negotiated between Miller Hydro Group and the Resource Agencies regarding bypass flows at the Worumbo Project. The memorandum includes minimum flows to be released to the bypass reach on a variable release schedule by month, and six special conditions.

Special condition No. 1 specifies that \$25,000 per year (to be increased each year by the previous years CPI) is to be provided to MDIF&W, for the remaining term of the current license, to implement a fisheries management program in the Lower Androscoggin River. We concur with this condition and note that the agencies are to develop a fisheries management plan for implementation of management goals and objectives on the lower river utilizing this funding.

Special condition No. 2 specifies that the Resource Agencies will designate a single lead agency to act as the contact agency. During the negotiations it was generally agreed that MDIF&W would be the lead agency. We concur with this condition. We are also in agreement with the rest of the special conditions, as well as the schedule of flow releases, with no further notes beyond an assumption that the FERC will likely require some form of standard compliance monitoring for the bypass flow releases. This will satisfy our concerns for this issue, which was voiced as an afterthought by our department after your memorandum of agreement was received.

We appreciate the efforts which went into reaching this negotiated agreement. If there are any questions regarding these comments please contact Steve Timpano at 289-3286.

Sincerely yours, Lein !

William J. Vai Commissioner

WJV/wb

cc: S. Pierce, MDIF&W L. Flagg, MDMR E. Baum, ASRSC D. Murch, MDEP G. Russell, USF&WS John R. McKernan, Jr. Governor

COMMISSION

William J. Vail, Commissioner Dept. Inland Fisheries & Wildlife Chairman

William Brennan, Commissioner Dept. Marine Resources ATLANTIC SEA RUN SALMON COMMISSION P.O. Box 1298 Bangor, Maine 04401

December 3, 1991

Mark Isaacson Miller Hydro Group P.O. Box 97 Lisbon Falls, Maine 04252

₩ 8 8 6 5 1 7 2 D DEC [6] - **1991**

RE: Worumbo Hydro Project Bypass Flows

Dear Mr. Isaacson:

This letter is to notify you of my general agreement with the proposed Worumbo bypass flows as outlined in the minutes of the October 1, 1991 agency consultation meeting and your Memorandum of November 20, 1991. However, I recommend that the following two minor issues be resolved now or at sometime within the near future:

- 1. At the October 1 meeting, MHG proposed a \pm 15 % fluctuation in minimum flows for short (0.5 hr) periods, while in the November 20 Memorandum MHG proposes (item 5) to be allowed to "undershoot the minimum requirement by an amount up to 50 % ...for a period not to exceed one hour." In all other minimum flow discussions and/or negotiations that I've been involved in, a minimum flow is just that. Therefore, I recommend that if and when an Atlantic salmon restoration program is initiated on the Androscoggin River, the flows proposed in your October 20, 1991 Memorandum shall be instantaneous minimums.
- 2. At the October 1 agency consultation meeting, MHG proposed to provide funding to DIFW for enhancement projects that could also benefit Atlantic salmon, while the November 20, 1991 Memorandum (item 1) refers to funding DIFW for a fisheries management program in the Lower Androscoggin Basin. Since the Maine DIFW has no jurisdiction over Atlantic salmon, nor any management authority for that species, the proposed funding probably wouldn't be utilized to benefit salmon. Therefore, I recommend that if and when an Atlantic salmon restoration program is initiated on the Androscoggin River, MHG should be prepared to provide the resources necessary to mitigate for the loss of Atlantic salmon habitat that will occur due to the proposed flow regime (e.g. habitat improvement and/or revised flow regimes, etc.)



Richard J. Warren Bangor, Maine

Paul Fernald Brunswick, Maine

Peter Wass Cherryfield, Maine



Mark Isaacson December 3, 1991

I trust that you will be able to accommodate the above recommendations in the final proposal to the FERC. Thank you for the opportunity to comment upon the proposed Worumbo Bypass Flows.

Sincerely yours,

aum

Edward T. Baum Program Coordinator

cc Flagg, DMR Murch, DEP Timpano, IFW Russell, USFWS

MILLER HYDRO GROUP

P.O. BOX 97 LISBON FALLS, MAINE 04252

TELEPHONE (207) 353-4111

December 23, 1991

Edward T. Baum, Program Coordinator Atlantic Sea Run Salmon Commission P. O. Box 1298 Bangor, Maine 04401

RE: Worumbo Bypass Flows

Dear Mr. Baum:

Thank you for your letter of December 3, 1991 in which you express general agreement with the proposed Worumbo bypass minimum flows as presented in our memo of November 20, 1991. At the meeting held on October 1, 1991, to which you declined invitation to participate, various flow and off-site mitigation scenarios were put forth by the participants for discussion purposes. Discussions also took place concerning compliance and enforcement issues. The meeting ended with the participants agreeing that Miller Hydro Group would draft a minimum flow agreement proposal based upon these discussions. On November 20, 1991 that draft proposal was submitted to the Resource Agencies. Subsequently, all of the agencies have responded with letters of agreement. The purpose of this letter is to respond to the two "minor" issues you raise in your letter.

At the October 1, 1991 meeting, during discussions 1. concerning enforcement and compliance issues, Miller Hydro Group suggested that it might request an agreement recognizing that small fluctuations in minimum flow for short periods are occasionally needed for project operations. At that time the figures \pm 15% and one half hour were mentioned for discussion purposes. The minutes of that meeting indicate no objection to this concept by any of the participating agencies. The actual proposal of November 20, 1991, while differing from the figures used in discussion at the meeting, reflect subsequent internal analysis of the operational situations which may arise from time to time during which it becomes necessary to adjust flows momentarily. In the past, the Resource Agencies have consistently authorized such events. All of the Resource Agencies participating in the October 1 meeting have concurred with the entire proposal including the compliance monitoring and enforcement sections. It should also be noted that a record of all events during which flows are

less than minimum, including time frame and purpose, is maintained for FERC inspection and compliance review purposes. This record is, of course, also available for inspection by the lead agency designated to act as the contact/enforcement agency.

2. According to the minutes of the October 1, 1991 meeting, the participants discussed mitigation of seasonal flows less than 300 cfs "...by habitat improvement in the vicinity of the Bypass Channel (say off the mouth of the Little River) and/or by funding of DIFW to conduct fisheries management projects on the lower Androscoggin River." The agencies also suggested the possibility that "...the funding requested for DIFW projects could be used to provide enhancements for Atlantic salmon if that restoration program should be activated ...". The off-site mitigation funding proposed by Miller Hydro Group in its November 20 memo is to be used for fisheries management programs in the Lower Androscoggin River Basin. No further restriction is implied in the proposal. Indeed, it is anticipated that, as stated by the Commissioner of DIFW in his letter concurring with the agreement, "...the agencies are to develop a fisheries management plan for implementation of management goals and objectives on the lower river utilizing this funding". The MHG proposal was formulated with the possible future salmon restoration activities in mind as discussed by the participants at the October 1 meeting. Miller Hydro Group has, in fact, proposed funding equal to the highest level and for the longest period (the entire remaining license period) discussed at the meeting. Miller Hydro Group has not reserved a role in the development of the fisheries management plan, except to require that all such activities take place within the confines of the Lower Androscoggin River Basin, and has no objection to the use of part, or even all, of the funding provided in the agreement for salmon restoration if and when such a program is initiated on the Androscoggin River.

However, we take strong objection to your suggestion that Miller Hydro make an open-ended commitment to provide additional funding for salmon restoration in the future. In short, that is not part of the agreement we have reached with all other agencies who actively participated in the process. This eleventh hour attempt to extract further concessions from Miller Hydro does not accomplish that objective, but it does place in jeopardy the entire agreement which has been reached after two years of difficult negotiations. A copy of your letter of December 3, 1991 will be included in our report to the Federal Energy Regulatory Commission as will copies of the letters of agreement from the other Resource Agencies. In addition, a copy of this response to your concerns will also be included in our report. If you have any questions, please contact us.

Sincerely, MILLER HYDRO GROUP Mark Isaacson

Vice President

Inland Fisheries & Wildlife

Inland Fisheries & Wildlife 284 State Street 41 State House Station Augusta, ME 04333-0041

Phone: (207) 287-3286 FAX: (207) 287-6395 email: steve.timpano@state.me.us

Wednesday, April 15, 1998

Mark Isaacson, Vice President Miller Hydro Group P.O. Box 97 Lisbon Falls, Maine 04252-0097

Re: Worumbo Hydro Project, FERC No. 3428-Maine Draft Application for Amendment

Dear Mark,

We have reviewed the Draft Application for Amendment for the Worumbo Hydro Project as discussed at the preconsultation meeting held March 30, 1998. The amendment being requested is to raise the headpond by 1.5 feet and to allow headpond fluctuations of that amount to provide for marketing spinning reserve capacity or limited peaking operation. The Draft appears to address most of the issues identified at the meeting, but we would like to offer the following comments and identify items which we feel should be more thoroughly documented or clarified in any final application.

FISHERIES;

Instream Flows: Our principal concern was for maintenance of required flows in the bypass reach, and for provision of adequate downstream flows during any drawdown/refill mode of operation. The Draft Application addresses both of these issues satisfactorily in concept. Bypass flows are to be provided as per the existing license, and a downstream release below the project (bypass and gate or turbine discharge combined) of 1700 cfs, or inflow, whichever is less, will be maintained during any headpond refill periods. Details as to final design and actual operational protocols to assure the specified flows are released can be elaborated upon more fully in the final application.

Impoundment Fluctuations/Fisheries Habitat: The Draft does not contain any description of freshwater fisheries resources. We would recommend at least a brief statement on habitat characterization and description of existing fisheries in any final applicaton. Based upon our current knowledge of this section of the river and discussions at the meeting it appears the proposed 1.5 foot increase in headpond elevation will be unlikely to cause any substantial changes in the existing freshwater fisheries. Present fisheries management is for warmwater species, principally smallmouth bass, pickerel, and yellow perch. and includes forage species such as minnows and white suckers. Brown trout have been experimentally stocked within the project area and assessment is ongoing. The headpond is considered to provide suitable habitat for at least seasonal salmonid management at this time. The additional small amount of riffle/run area at the upstream end of the impoundment which would be partially inundated by raising the headpond 1.5

feet is expected to cause little overall change in suitability for salmonid management purposes. To the best of our knowledge present warmwater gamefish populations are maintaining themselves under current operating regimes. The proposed 1.5 foot headpond elevation change, and periodic fluctuation within that range, are likely to be tolerated by present species in terms of spawning success and maintenance of adequate adult habitat. We would also note that greater fluctuations have been permitted at upstream hydroelectric projects (Gulf Island Pond , Lewiston Falls).

Can the various flow graphs presented in the Draft Application be revised to be more readable or have additional verbal description of what they represent? As presented they are difficult to readily understand and interpret. Also the presentation to answer the question raised at the meeting re: how frequently the project might be operated to supply spinning reserve, and thereby result in headpond drawdown, is difficult to interpret. The copy of the CMP filing which is included as Exhibit C in the Draft appears to simply reference percentage of spinning reserve available at Monty Station and Gulf Island as part of the whole CMP system, not probability or how often they were actually called upon to provide that spinning reserve. Can that be clarified? We understand that predicting frequency of drawdowns also depends upon market and contract provisions which are simply unknown at this time. Given that freshwater fisheries resources are not expected to be substantially affected by the degree of fluctuation the question of "how often" is more a matter of record than an issue for us.

Fish Passage: Fish passage is not required at Worumbo for inland (freshwater) fisheries management at this time. We will defer to the Department of Marine Resources and the U.S. Fish & Wildlife Service review of adequacy of existing facilities under the proposed revised water management regime.

Water Quality: From the discussion at the meeting it is our understanding that the proposed physical and operational changes are unlikely to substantially alter present water quality conditions, and therefore not change fisheries habitat suitabilities. Soil erosion issues regarding riverbank stability with the increased headpond level were also discussed and the concensus was that this was not likely to be a problem. Given the seasonal changes in water elevations the river presently experiences, and that higher headpond levels had been maintained in the past, we believe this issue has been adequately addressed. The proposed future monitoring to identify and remediate any developing problem areas is appropriate.

WILDLIFE:

Endangered & Threatened Species, Essential Habitats; No Endangered or Threatened species of wildlife are known to occur within the Worumbo Project area and no Essential Habitats for endangered species have been designated. There may be occasional transient passage of Bald Eagles or Peregrine Falcons through the project area.

<u>Significant Wildlife Habitats</u>: No Significant Wildlife Habitats as recognized under Maine's Natural Resources Protection Act (e.g. high or moderate value Waterfowl and Wading Bird Habitats, Deer Wintering Areas or travel corridors, etc.) have been identified for the project area. As noted in the draft application, steep banks along this section of the river limit wetland development. Our Department rates this segment of the river itself as providing low value waterfowl and wading bird habitat. We concur that raising the headpond elevation 1.5 feet is unlikely to substantially affect wetland wildlife habitat. Would attaching a copy of the pertinent section of the National Wetlands Inventory map in the final application be advisable to go along with the narrative?

No other wildlife resources have been identified of concern with the proposed project modifications.

PUBLIC RECREATIONAL ACCESS:

Angler Access: It appears the present trailered boat launching facility located at the confluence with the Sabattus River will continue to provide adequate access to the headpond. Based upon the information provided, the ramp will remain useable and clearance under the Rte. 196 and railroad bridges between the launch site and the headpond will also remain satisfactory even with the headpond elevation increase. No changes to downstream walk-in angler access below the Project are anticipated.

Based upon the above considerations, we see no objections or substantial concerns with the amendment as proposed. Thank you for the opportunity to comment on the proposed project modifications. If there are any questions please contact Steve Timpano, Environmental Coordinator, at the above address or by telephone at (207) 287-3286.

Sincerely,

Frederick B. Hurley, Jr.

Deputy Commissioner

cc; FERC Coordinating Committee Gordon Russell, USF&WS John Boland/Philip Bozenhard, Gray Regional Hdqtrs. FBH/sat



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1911-191-191

ANGUS S. KING, JR. GOVERNOR

EDWARD O. SULLIVAN COMMISSIONER

April 16, 1998

Mark Isaacson, Vice President Miller Hydro Group PO Box 97 Lisbon Falls, ME 04252-0097

RE: Draft Application for Amendment of License Worumbo Hydroelectric Project FERC No. 3428

Dear Mark:

The Department has reviewed your letter of April 10 and the accompanying draft application for amendment of license for the existing Worumbo Hydro Project, FERC No. 3428, located on the Androscoggin River in Lisbon Falls.

STATE OF MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

I understand that Miller Hydro Group is proposing to increase generation at the project by installing crest gates and flashboards to increase the normal full pond elevation of the impoundment by 1.5 feet, while maintaining existing bypass flows.

I also understand that Miller Hydro Group is proposing to increase the value of generation at the project by drawing the impoundment down by up to 1.5 feet to provide a marketable source of reserve capacity, while maintaining a minimum flow release from the project of 1700 cfs or inflow, whichever is less, during impoundment refill.

The Department has concluded that the proposed amendment will not have a significant impact on existing water quality. I understand from the data you have submitted to the Department that the increase in full pond level will increase the volume of the impoundment by about 285 acre-feet from the existing 1700 acrefeet. I also understand that, even at 7Q10 flow (2000 cfs), the impoundment will refill in about 11 hours after being drawn down by a full 1.5 feet. Neither of these conditions will result in any significant increase in travel time through the impoundment; as a result, no adverse water quality impacts are expected.

AUGUSTA 17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017 106 HOGAN ROAD (207) 287-7688 RAY BLDG., HOSPITAL ST.

BANGOR BANGOR, MAINE 04401

PORTLAND 312 CANCO ROAD PORTLAND, MAINE 04103

PRESOUE ISLE 1235 CENTRAL DRIVE, SKYWAY PARK PRESQUE ISLE, MAINE 04769-2094 (207) 941-4570 FAX: (207) 941-4584 (207) 822-6300 FAX: (207) 822-6303 (207) 764-0477 FAX: (207) 764-1507

Letter to Mark Isaacson April 16, 1998 Page 2

The Department will need to approve the proposed amendment in project design and operation as a modification of the Maine Waterway Development and Conservation Act Permit and Water Quality Certification previously issued for the project (DEP #L-10930-35-A-N dated June 12, 1985, and as subsequently modified). An application form is enclosed for your use. When filing the completed application, please include a check for the processing fee of \$103 and two(2) copies of the license amendment application as filed with FERC.

Also, the final amendment application as filed with FERC should discuss any instream work (especially cofferdamming) associated with the installation of the proposed crest gates and hinged flashboards.

Please call if you have any questions.

Sincerely,

Berl Musch

Dana Paul Murch Dams & Hydro Supervisor

\worumbo1.doc Enclosure

cc: Betsy Elder, SPO Lew Flagg, DMR Steve Timpano, IF&W Art Spiess, MHPC Gordon Russell, USF&WS


United States Department of the Interior

FISH AND WILDLIFE SERVICE New England Field Office 22 Bridge Street, Unit #1 Concord, New Hampshire 03301-4986

REF: FERC #3428 Worumbo Project Application for License Amendment

Mr. Mark Isaacson Miller Hydro Group P.O. Box 97 Lisbon Falls, Maine 04252-0097

Dear Mr. Isaacson:

We have reviewed your draft application for amendment of license for the Worumbo Hydroelectric Project, located on the Androscoggin River in Maine. We understand that you are proposing to modify the dam crest using new flashboards and hinged gates such that the impoundment would be raised from 97.0 to 98.5 ft. MSL. Instead of run-of-river operation as currently required in Article 30 of the license, the project would be cycled occasionally to meet immediate reserve capacity needs which are expected to exist in future energy markets. This would require that the headpond be drawn down as much as 1.5 ft. (i.e., to 97.0 ft.).

We have already provided you with our initial comments on the proposed modification of the Worumbo project in a preconsultation meeting that was held in Augusta on March 30, 1998. As was discussed then, it appears that the changes in dam structures and operations will likely have minimal impacts to fish and wildlife resources based on the following findings:

1) Operation of existing fish passage facilities: The existing upstream fish lift and downstream fishway at Worumbo can operate effectively when the headpond elevations are between 97.0 and 98.5 ft. Based on information received at the meeting and on materials attached to the draft application for amendment, it appears that cycling operations would be infrequent during the peak upstream migration period (May - June), thus avoiding impacts to anadromous fish due to pulsed discharges. We have previously recommended meeting with you annually to discuss operation of the upstream and downstream fishways (meeting held on March 3, 1998 to discuss results of downstream passage studies). We suggest incorporating as an agenda item at those future meetings a review of the frequency and timing of cycling operations to determine whether there are any adverse effects on anadromous fish runs.

April 27, 1998

2) <u>Maintenance of instream flow releases</u>: As discussed in the draft amendment application, you plan to continue to comply with the provisions of Article 31, which incorporates an agreement with state and federal resource agencies on instream flow releases in the bypassed reach immediately below the Worumbo dam. We understand that you intend to install flashboards on the portion of the dam where the bypass flows are currently released, and to manage the impoundment level to ensure that the agreed upon discharges continue to occur. We concur with your recommendation to develop a new protocol for monitoring pond levels and flows in the bypassed reach following modification of the project.

As mentioned above, you are proposing to amend Article 30 of your license which requires run-of-river operation of the Worumbo project. We concur with your plan to release the estimated median August flow, 1700 cfs (0.5 cfsm) +/- 100 cfs from the project, or inflow, whichever is less, as a substitute for run-of-river operation. This aquatic base flow is proportionately the same as what we have agreed to at the Pejepscot project, located immediately downstream from Worumbo, and should be sufficient to protect anadromous fish and other aquatic life in the Androscoggin River.

- 3) <u>Alteration of habitats, including wetlands</u>: The proposed modification of the Worumbo project would increase the extent of the headpond, and potentially reduce the amount and/or quality of riverine habitat, and could result in the inundation of riparian areas, including wetlands. As discussed at the March 30, 1998 meeting, and as described in the draft amendment application, it appears that the inundation of existing riverine habitat and riparian wetlands will be minimal due to the slope of the shoreline and steep gradient at the present upstream limit of the impoundment. We concur with your proposed monitoring of shoreline conditions after the impoundment level increases to determine whether there is any erosion or other modification of riparian habitats.
- 4) <u>Recreational use and access</u>: We concur with your findings that proposed modification of the Worumbo project will have minimal impact on the existing boat launching facility on the impoundment, and should not affect recreational access below the dam.

We appreciate the opportunity to provide comments on your proposed amendment of license for the Worumbo project. If you have any questions, please contact Gordon Russell at (207) 827-5938.

Sincerely yours,

P

Michael J. Bartlett Supervisor New England Field Office

cc: RO/EN (Ben Rizzo) SOL/NE (Judy Stolfo) NMFS, Gloucester (Jon Kurland) EPA, Boston (Ralph Abele) ME DEP, Augusta (Dana Murch) ME DOC, Augusta (George Hannum) ME SPO, Augusta (George Hannum) ME SPO, Augusta (Evan Richert) ME IFW, Augusta (Steve Timpano) ME DMR, Augusta (Lew Flagg) ME ASA, Bangor (Ed Baum) Kennebec Coalition (Ron Kreisman) 25 Page St. Hallowell, ME 04347-1418 Reading File

ES: GRussell:4/27/98:(207)827-5938



ANGUS S. KING, JR.

STATE OF MAINE DEPARTMENT OF Marine Resources 21 State House Station Augusta, Maine 04333-0021



E. PENN ESTABROOK COMMISSIONER, (ACTING)

April 27, 1998

Mark Isaacson, Vice President MILLER HYDRO GROUP PO Box 97 Lisbon Falls, ME 04252-0097

RE: Draft Application for Amendment of License Worumbo Hydroelectric Project, FERC No. 3428

Dear Mark:

The Department of Marine Resources (DMR) has reviewed the Draft Application for Amendment of License for the Worumbo Hydro Project, FERC No. 3428, located on the Androscoggin River in Lisbon Falls. Miller Hydro proposes to increase generation by installing crest gates and flashboards to increase the normal full pond elevation by 1.5 feet. The existing bypass flows on the Durham side will be maintained under normal operating conditions by installing pneumatically operated, hinged steel crest gates at elevation 98.5 msl over the entire length of the Durham side dam, with conventionally operated hinged flashboards at elevation 99.0 msl over the remaining section to force bypass flow to the Durham side. Seasonally adjusted bypass flow will be maintained as required in Article 31 of the License. During periods of drawdown (to elevation 97.0 feet), the pneumatically operated crest gates would also be lowered to maintain the required bypass flow.

Miller Hydro also proposes to have the authority to draw the impoundment down from elevation 98.5 to elevation 97.0 when necessary to provide a marketable source of reserve power. A minimum flow release of 1700 cfs (approximate Aquatic Base Flow) or inflow, whichever is less, will be maintained during refill.

DMR has had an ongoing restoration program for shad and river herring on the Androscoggin and Little Androscoggin Rivers since 1983, and has been trapping, sorting, and releasing river herring, American shad, and Atlantic salmon from the Brunswick HydroElectric facility since that time. In addition, DMR has trucked alewives to various lake systems above the Worumbo Project since 1983 and has been stocking adult prespawning shad (mostly from the Connecticut River) in the river segment above Worumbo. When the Worumbo Project was redeveloped in 1989, a fish lift was installed to provide for upstream passage of anadromous fish; permanent downstream passage facilities were also installed. Mark Isaacson 27April98 Page 2

Based on our knowledge of the Worumbo fish passage facilities, we do not believe that raising the headpond by 1.5 feet will impact their operation, but we defer to the USF&WS for a more detailed review to see if any modifications to these facilities are needed.

The Licensee proposes to release a minimum flow of 1700 cfs or inflow, whichever is less. The Licensee indicates that the flows normally exceed the project wheel capacity (approximately 9600 cfs) during the alewife and shad run in May and June and thus, would create little chance for fluctuating water flows. DMR has reviewed the mean daily flows in May and June from 1983 through 1996 as recorded at the USGS Auburn gage. Normally, flows drop below 10,000 cfs by mid May and are commonly below 5000 cfs in early June. Flows would be slightly higher at the Worumbo dam because of the larger drainage area (3,382 vs 3,263 square miles). Although DMR believes that the flows will commonly be below 9600 cfs during the alewife and shad runs, because of the limited pond capacity, the duration of the refill should be short. The Licensee also indicates that it is unlikely they will routinely fluctuate the headpond for peaking purposes. The Licensee states they are seeking authority to operate in a peaking mode, but such operation would be occasional or rare. Under these circumstances, DMR does not believe the proposed operational mode will significantly affect the passage of alewives and shad. DMR notes that upstream and downstream passage studies at the Worumbo dam are on "hold" and will be reinitiated in the future when populations of these species have recovered to the extent that these studies would be meaningful. When studies are reinitiated, DMR recommends the operational mode be incorporated into the design.

Based on our review of the Draft Application, DMR does not believe there will be any significant impact on anadromous fish resources; therefore, we have no objections to the proposed amendment. If you have any questions, please feel free to contact Thomas Squiers at (207) 624-6348.

Sincerely,

Servis n. Thag

LEWIS N. FLAGG, DIRECTOR STOCK ENHANCEMENT DIVISION

LNF/jcw

cc State FERC Coordinating Committee Jon Kurland, NMFS Gordon Russell, USF&WS

APPENDIX G

ORDER APPROVING AND MODIFYING MINIMUM LOW RELEASE PLAN AND Amending License

ORDER APPROVING FINAL SPECIES PROTECTION PLAN FOR ATLANTIC SALMON

PYI Kesi

UNITED STATES OF AMERICA 66 FERC 62, 041 FEDERAL ENERGY REGULATORY COMMISSION

Miller Hydro Group, Inc.

Project No. 3428-029--Maine

ORDER APPROVING AND MODIFYING MINIMUM FLOW RELEASE PLAN AND AMENDING LICENSE (ISSUED JANUARY 26, 1994)

On December 30, 1991, the Miller Hydro Group, licensee for the Worumbo Project (FERC No. 3428) filed the results of an instream flow study and, based on study results, recommendations for changing the project's minimum flow requirement. The filing was supplemented by a letter filed January 8, 1992. The filing of this information was required by article 32 of the project license. 1

Article 32 stipulates, in part, that the licensee study the relationship of various minimum flow releases, including the interim minimum flow specified by article 31, 2 to fish habitat in the 850-foot-long bypass reach of the Androscoggin River between the Worumbo Dam and the powerhouse. Article 32 further states that the licensee shall conduct the study as approved by the Commission and file a report, and any recommendations for continuation or modifications of minimum flow releases as deemed necessary.

The study plan was filed on June 2, 1987 and approved by the Commission on August 5, 1987. 3 Following consultation with the agencies, the licensee made habitat improvements below the dam in 1989 and 1990, prior to conducting the study. The study was conducted jointly by the licensee and the agencies in August and September 1990. Following compliant ion of the study and analysis of the results, the licensee and agencies engaged in extensive consultations and negotiations concerning the appropriate flows, including seasonal flows. The licensee's proposal, as described below, represents a negotiated agreement expressing the joint recommendations of the licensee and resource agencies.

1 33 FERC 62,430 (1985)

2 For the protection of fish resources, article 31 requires, in part, that the licensee discharge a minimum flow of 25 cubic feet per second (cfs) as measured immediately downstream of the dam.

3 40 E RC 62,128 (1987)

Study Results

The bypass reach was divided into five sections, and habitat within each section was evaluated at flows of 25, 100, 200, 300, and 400 cfs using a study team Delphi consensus method. Using this method, a team of expert observers viewed each flow level and collectively rated habitat suitability for the species and life stages of concern. Group consensus was reached using numerical rating scales derived from accepted Suitability Index (SI) curves or word models for specific habitat parameters and fishing opportunity.

The species and life stages of interest were adult brown trout, adult smallmouth bass, and juvenile Atlantic salmon. The effect of flows on fishing opportunities was also considered. The study showed, in summary, that a flow of 300 cfs maximizes the amount of habitat for the species/life stages of concern. Fishing opportunities were determined to be greater at the higher flows.

Recommendations

Based on the results of the study and consultations and negotiations conducted during meetings held on January 9, February 6, May 2, and October 1, 1991, the licensee proposes the following six measures relative to minimum flow releases.

(1) Release in imum flows at the project according to the following scheme.

September 1 - October	31	200	cfs	
November 1 - November	30	50	cfs	4
December 1 - April 15	· ,	50	cfs	
April 16 - May 31		300	cfs	
June 1 - June 30		200	cfs	
July 1 through Aul.st	31	100	cfs	

(2) Provide funding of \$25,000 per year for the remainder of license term (i.e., until the year 2025) to the Maine Department of Inland Fisheries and Wildlife (DIFW) for a fisheries management program in the lower Androscoggin River basin. This amount will be increased or decreased, as appropriate, by the Consumers Price Index (CPI) for the previous year.

4 Unless the downstream fishway is operational, in which case 85 cfs.

(3) The DIFW will be the lead agency to act as the resource agency contact, with sole authority to permit exception to the proposed bypass flows.

(4) The licensee will modify the dam spillway as necessary to concentrate bypass flows over the crib (i.e., west) side of the dam.

(5) The licensee may deviate from the proposed bypass flows without penalty under any of the following conditions:

- A. operating emergencies;
- B. by order of any jurisdictional government agency; and
- C. as authorized in advance by the DIFW.

(6) In addition, the licensee may undershoot the proposed minimum flow up to 50 percent for periods not to exceed one hour, provided that only one such underrelease may be made in a 24-hour period without authorization from the DIFW.

Agency Comments

The licensee consulted with the DIFW, the Maine Department of Marine Resources (DMR), the Atlantic Sea Run Salmon Commission (ASRSC), and the U.S. Fish and Wildlife Service (USFWS), in the development and implementation of the study, and in the interpretation of study results. This consultation was documented in letters and in minutes of meetings held to discuss study results and to develop flow recommendations.

In general, the DMR deferred comments to the DIFW, since the target species were the jurisdiction of the latter agency. The ASRSC's participation was limited due to lack of personnel resources. By letter dated December 3, 1991, the ASRSC indicated general agreement with the licensee's proposed measures, but stated that two "minor issues" needed to be resolved. However in a second letter, dated December 27, 1991, the ASRSC provided clarification of its December 3, 1991 letter and stated that the proposed measures should provide the opportunity to accommodate all the fishery management goals and objectives on the lower river.

The DIFW and the FWS were intimately involved in the development and implementation of the study, the interpretation of study results, and the development and negotiation of flow recommendations. Consequently, the proposed measures reflect the inputs of these agencies. Agency recommendations included into the proposed measures include designation of the DIFW as the lead agency to act as the resource agency contact and the provision of off-site mitigation, implemented through the licensee's funding of the agency-developed fisheries management plan. The DIFW and the FWS expressed concurrence with the proposed measures by letters dated December 4, 1991 and December 10, 1991, respectively.

Discussion

The instream flow study indicated that a flow of 300 cfs maximized the amount of quality habitat available in the 850foot-long bypass reach between the Worumbo Dam and the project's powerhouse. While the licensee agreed that 300 cfs would be desirable at certain times of the year, corresponding to specific needs, the licensee felt that the need for higher flows during other times of the year (e.g., winter) was not well documented. The licensee argued that the year-round release of 300 cfs would seriously impact project economics.

After extensive negotiations, all parties agreed that other off-site mitigation could compensate for loss of habitat resulting from a flow regime whereby less than the optimum amount of habitat was present during some periods of the year. This mitigation would be funded by the licensee's annual payments of \$25,000 to the DIFW.

The proposed measures reflect a compromise wherein the licensee's proposed flow regime would serve to provide optimum habitat at those times when a need has been identified. While the proposed releases provide less habitat at other times of the year, this loss is offset through the funding of off-site mitigation to be directed at identified problems.

However, the licensee's proposed measures do not include a description of how the licensee proposes to measure the minimum flow releases or a schedule for reporting any deviations from the specified flows. Because the licensee does not currently measure project inflows or outflows, it will be probably be necessary to install stream gaging equipment in the bypass reach in order to measure and document compliance with the required minimum flow releases. Consequently, the licensee's proposal should be modified to state that the licensee will develop and file, for Commission approval, a plan for measuring and reporting minimum flow releases in the bypass reach. The plan should be developed in consultation with the DIFW. Although the proposed minimum flows will be effective as of the issuance of this order, the licensee should be granted a reasonable period of time, ninety days, to develop and file the gaging plan.

Additionally, the proposed plan contains no provisions for reporting the mit.; ative measures undertaken by the DIFW with the \$25,000 annual payments. To ensure that appropriate measures are being undertaken, the licensee should consult with the DIFW and file annual reports, by March 1 each year, describing the measures implemented during the previous year. The Commission should reserve the right to modify the procedures for identifying and implementing the mitigative measures to be funded with the \$25,000 annual payments, should the reports indicate that such changes would serve to better protect and enhance the fishery resources of the Androscoggin River.

In summary, the licensee's proposed flow regime and related measures, modified as described above, would serve to protect and enhance fisheries resources in the project area. Consequently, the proposed measures, as modified, should be approved.

The Director orders:

(A) The licensee's recommendations for minimum flow releases, filed on December 31, 1991, as modified in paragraphs(C) and (E), below, are approved.

(B) Article 31 is hereby amended to read as follows:

Article 31. For the protection and enhancement of fisheries resources, the licensee shall discharge from the Worumbo Dam Release minimum flows, as measured immediately downstream from the dam, according to the following schedule.

September 1 - October	31	200	cfs
November 1 - November	30	50	cfs 5
December 1 - April 15		50	cfs
April 16 - May 31		300	cfs
June 1 - June 30	• .	200	cfs
July 1 through August	31	100	cfs

These minimum flows may be temporarily modified if required by operating emergencies or by order of any jurisdictional government agency, or as authorized in advance by the DIFW. Further, the licensee may undershoot the stated minimum flow up to 50 percent for a period not to exceed one hour, provided that only one such underrelease may be made in a 24-hour period without authorization from the DIFW.

5 Unless the downstream fishway is operational, in which case 85 cfs.

(C) Within 90 days from the date of issuance of this order, the licensee shall file, for Commission approval, a plan for measuring and documenting compliance with the minimum flow releases required in (B), above, and for reporting any deviations from the scheduled flows.

The gaging plan shall be developed in consultation with the DIFW. The developed plan shall contain documentation of consultation with the DIFW. Upon approval of the plan by the Commission, the licensee shall implement the plan, including any changes ordered by the Commission.

(D) The licensee shall provide funding in the amount of \$25,000 per year for the remainder of license term to the Maine Department of Inland Fisheries and Wildlife (DIFW) for mitigative measures to be implemented through a fisheries management program in the lower Androscoggin River basin. This amount will be increased or decreased, as appropriate, by the Consumers Price Index (CPI) for the previous year.

(E) The licensee shall consult with the DIFW and file annual reports, by March 1 each year, describing the mitigative measures implemented during the previous year with the \$25,000 annual payments. The Commission reserves the right to modify the procedures for identifying and implementing the mitigative measures to be funded with the \$25,000 annual payments, should the reports indicate that such changes would serve to better protect and enhance the fishery resources of the lower Androscoggin River basin.

(F) 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

163 FERC ¶ 62,091

UNITED STATES OF AMERICA FEDERAL ENERGY REGULATORY COMMISSION

Brown Bear II Hydro, Inc.

Project No. 3428-171

ORDER APPROVING FINAL SPECIES PROTECTION PLAN FOR ATLANTIC SALMON

(Issued May 11, 2018)

1. On July 6, 2016, Brown Bear II Hydro, Inc. (Brown Bear or licensee) filed a Final Species Protection Plan (Final SPP) for the Worumbo Hydroelectric Project No. 3428.¹ The Final SPP is attached to a draft Biological Assessment (BA) that the licensee developed with the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA). The Final SPP describes measures that the licensee would take to avoid and minimize impacts to federally-listed endangered Atlantic salmon² during operation of the project. The Worumbo Project is located on the Androscoggin River in Androscoggin County, Maine.

I. Background

A. <u>Project Description and Existing Fish Passage Facilities and Operation</u>

2. The Worumbo Project includes north and south concrete overflow spillway sections topped by pneumatically-controlled Obermeyer gates and a gated spillway section with four vertical slide gates. The project has upstream and downstream fish passage facilities, which were designed and constructed pursuant to license Article 34. Upstream passage facilities include a cable-operated vertical lift system with two downstream entrances, a fish-counting room and viewing window, and an exit canal leading to the reservoir. Downstream passage facilities include three entrance gates with trashracks located at the surface of the reservoir, a connecting gallery, a downstream passage pipe, and a plunge pool with a depth controlled by two sectional gates.

¹ *Miller Hydro Group, Inc.*, 33 FERC ¶ 62,430 (December 24, 1985).

² Atlantic salmon using the Androscoggin River in the vicinity of the project are part of the Gulf of Maine Distinct Population Segment (Gulf of Maine DPS).

3. Pursuant to a November 12, 1998 Order Approving Fish Passage Studies (1998 order), the licensee conducts annual meetings with the Maine Department of Marine Resources (Maine DMR) and the U.S. Fish and Wildlife Service (FWS) in order to determine schedules for operation of the passage facilities.³ In 2012, NMFS began participating in the annual meetings to help ensure safe passage of federally-listed Atlantic salmon.

B. <u>Previous ESA Consultation and Interim Species Protection Plan</u>

4. In 2011 and 2012, to ensure dam safety during high-flow periods, the licensee replaced the project's original timber crib overflow section with the two concrete spillways topped with Obermeyer gates. Because federally-listed Atlantic salmon are present in project waters, the Commission entered into emergency ESA consultation with NMFS under that agency's joint regulations to reduce any impacts to salmon during the work, and to ensure the new features could be operated to safely pass migrating salmon during spring outmigration periods.⁴

5. On May 14, 2012, the licensee filed with the Commission two draft BAs it developed in cooperation with NMFS. The first was an after-the-fact BA produced as part of the emergency ESA process. The second BA addressed effects to federally-listed salmon of continued project and fish passage operation, including actions proposed in an Interim Species Protection Plan (Interim SPP) attached to the draft BAs. The Interim SPP covered a five-year period, beginning in 2012, and identified a series of measures that the licensee would take to avoid and minimize impacts to salmon during that period. On June 7, 2012, the Commission adopted the two BAs without modification and provided them to NMFS.

6. On October 18, 2012, NMFS filed with the Commission a single Biological Opinion (BO) addressing the BAs and the Interim SPP. The BO included one reasonable and prudent measure and four implementing terms and conditions. The reasonable and prudent measure required the Commission to ensure that the licensee completes an annual monitoring and reporting program to confirm that it is minimizing incidental take of Atlantic salmon and reporting dead or injured salmon to NMFS. The four terms and conditions indicated the Commission must require the licensee to: (1) notify NMFS of any changes in operation, maintenance, and debris management during the Interim SPP, and allow NMFS to inspect project fishways; (2) contact NMFS within 24 hours of any interactions with Atlantic salmon; (3) take certain steps in the event of any lethal take;

⁴ 50 C.F.R. 402.05 (2017).

³ *Miller Hydro Group, Inc.*, 85 FERC ¶ 62,089 (1998).

and (4) prepare a plan, in consultation with NMFS, to study passage and survival of migrating salmon adults, smolts, and kelts at the project.

7. On May 31, 2013, Commission staff issued an order approving the licensee's Interim SPP and incorporating the 2012 BO's terms and conditions into the project license (2013 order).⁵ In that order, staff also approved plans filed by the licensee on December 19, 2012 to study upstream passage of adult salmon and downstream passage of salmon smolts.

8. Pursuant to the approved Interim SPP, the licensee would, for up to three years, study existing upstream and downstream salmon passage at the project. During the downstream passage studies, the licensee would also monitor bird predation on salmon smolts. In cooperation with NMFS and FWS, the licensee would use the study results to identify needed improvements to fish passage and protection. The licensee would then prepare and file annual Interim SPP reports, in coordination with NMFS, FWS, and Maine DMR, on the work performed under the Interim SPP.

9. Paragraph (B) of the 2013 order required the licensee to prepare annual reports in 2013, 2014, and 2015 and file them with the Commission by March 31 of the following years. Paragraph (B) also required the last report to contain a summary of any proposed salmon protection measures that would be implemented for the remaining term of the license, along with a schedule for preparing a Final SPP and filing it with the Commission.

10. Paragraph (G) of the 2013 order required the licensee, during each annual meeting held with the resource agencies pursuant to the 1998 order, to determine a schedule for operating the project's new spillway gates to provide downstream passage of Atlantic salmon smolts, and to include in those reports summaries of the licensee's agency consultation and gate operation pursuant to the 1998 order.

11. Pursuant to the Interim SPP, the licensee conducted Atlantic salmon passage studies in 2013, 2014, and 2015, and filed annual Interim SPP reports on March 31, 2014, March 31, 2015, and March 30, 2016. As discussed above, Brown Bear filed its Final SPP on July 6, 2016.

II. <u>Final Species Protection Plan</u>

12. The licensee's Final SPP would be in effect until the issuance of any new license for the Worumbo Project. The current license expires November 30, 2025. During the term of the Final SPP, the licensee would continue to follow measures developed to

⁵ *Miller Hydro Group, Inc.*, 143 FERC ¶ 62,162.

protect federally-listed Atlantic salmon. These measures include: (1) operating the project's existing Obermeyer gates to allow continuous flow in the bypassed reach and continuous downstream Atlantic salmon passage; (2) operating the project's upstream and downstream fish passage facilities for Atlantic salmon and other anadromous species, in coordination with downstream hydroelectric projects and in consultation with the Maine DMR; (3) operating the project in a run-of-river mode and providing seasonal bypass and instream flows to protect Atlantic salmon habitat; (4) maintaining the project's fishways, including management of debris; (5) monitoring bird predation during downstream salmon passage studies; and (6) continuing required monitoring and reporting.

13. Under the Final SPP, the licensee would also take additional measures, developed in consultation with the resource agencies, as summarized below.

A. Adaptively Modify Fishway and Project Operations

14. The Final SPP provides that the licensee would modify operation of the existing fish passage facilities based on adaptive decision-making with NMFS and Maine DMR. The upstream fish passage facilities would be operated May 1 to November 15 each year, river conditions permitting, or using alternate dates as approved through consultation with the agencies. The licensee would schedule maintenance activities and temporary shutdowns between the end of July and mid-August and would maintain flexibility for scheduling emergency repairs outside that window. The licensee would coordinate with Maine DMR and confirm NMFS approval for any modified operation dates. Downstream passage facilities would be operated April 1 to December 31 each year, river conditions permitting, to allow passage of any downstream-migrating anadromous fish. The licensee would coordinate with NMFS and Maine DMR prior to modifying downstream passage operation dates.

15. Based on the results of downstream salmon smolt passage studies conducted between 2013 and 2015, the licensee would operate the project's floodgate at certain times and release rates to provide another downstream passage route for salmon smolts. These releases would only be made if it is known that at least two adult Atlantic salmon were passed upstream two years prior, indicating that successful spawning may have occurred and smolts could therefore be moving downstream, or if an Atlantic salmon stocking program is established upstream of the project.

B. Downstream Salmon Passage Performance Standard

16. The licensee proposes to operate the downstream passage facilities to meet a minimum performance standard for downstream migrating Atlantic salmon of 87 percent survival, which is consistent with the intent of the Interim SPP and based on the results of the smolt survival studies. In the event future monitoring under the Final SPP reveals that this standard is not being met, the licensee would evaluate, in consultation with

NMFS and the other resource agencies, additional measures to direct outmigrating salmon to the most effective passage routes, and would monitor passage survival the following year to confirm that the standard is met. Establishing a project-specific performance standard of 87 percent that is consistent with recent study results, in addition to the other protection measures described in the Final SPP, would allow any salmon originating upstream to contribute to the Merrymeeting Bay Salmon Habitat Recovery Unit (SHRU) population and the overall Gulf of Maine DPS.

17. Establishing a performance standard is consistent with the Merrymeeting Bay SHRU Recovery Actions outlined in a 2016 work plan developed by FWS and NMFS. The downstream passage studies conducted between 2013 and 2015 demonstrated compliance with this standard. The Final SPP provides that additional monitoring would be conducted in 2025. The monitoring frequency would be consistent with species protection plans accepted by NMFS for hydropower projects on the lower Penobscot River, once a performance standard has been met.

C. Adult Salmon Passage Studies

18. The licensee indicates that it would continue monitoring adult Atlantic salmon moving upstream through the fish lift throughout the upstream passage operation season. However, it noted that there are currently no Atlantic salmon originating from upstream of the project, and any fish present have originated from downstream areas or other watersheds and could be less motivated to move upstream at the project, affecting any detailed effectiveness assessment of upstream passage. Based on Maine DMR's documented returns of Atlantic salmon passing through the fish lift at the downstream Brunswick Project No. 2284, the licensee determined that there are currently too few adult salmon migrating into the Androscoggin River to conduct a rigorous and defensible fish passage effectiveness study.

19. The licensee indicates that if, within the term of the Final SPP, adult Atlantic salmon begin to return to the Androscoggin River in substantially larger numbers, it would implement an adaptive management approach to further study salmon passage. Based on existing information on adult salmon counted at Brunswick that go on to reach Worumbo, at least two consecutive years of 40 adult salmon of naturally-reared origin passing Brunswick and moving upstream would be needed to obtain useful, statistically significant data. The licensee therefore proposes that, when this occurs, it would consult with the agencies to develop a detailed study plan to monitor upstream and downstream adult Atlantic salmon passage the following year. The installation of tracking equipment at the Worumbo fish lift entrance and exit would enable the licensee to monitor the success of salmon using the upstream passage facilities. Specific methodology and monitoring locations would be determined during development of the study plan. Monitoring equipment could also be added to the downstream passage facilities at Worumbo to monitor downstream passage of kelts through late fall, if that is determined necessary through the adaptive management approach.

D. <u>Mapping Atlantic Salmon Habitat in the Little River</u>

20. The licensee proposes to map Atlantic salmon habitat and migration barriers in the Little River, which flows into the Androscoggin River downstream of the Worumbo Project, because it contains historic salmon spawning and rearing habitat. Mapping data would help identify areas with quality salmon spawning and rearing habitat that need protection; would help estimate salmon production potential in the Little River; and would aid in the selection and prioritization of habitat improvement opportunities there. The licensee would discuss the results of its surveys with NMFS and Maine DMR to identify potential enhancement projects. This work would be done in cooperation with the licensees of the two projects located immediately downstream (the Pejepscot Project No. 4784, and the Brunswick Project).

E. <u>Annual Reporting</u>

21. Under the Final SPP, the licensee would prepare annual reports with the resource agencies to review the previous year's activities and assess the need to continue or modify activities using adaptive management, including the upstream and downstream passage studies. The licensee would submit annual reports to NMFS, FWS, and Maine DMR, and file them with the Commission by the end of March the following year.

22. The licensee states that its annual reports would include information on consultation, fish passage, and protection measures that it currently includes in annual fishway status reports filed pursuant to the November 12, 1998 order. The licensee states that including this information in the annual Final SPP reports, and eliminating the reporting requirement of the 1998 order, would eliminate a redundancy in consulting and reporting requirements at the project.

III. <u>Public Notice and Responses</u>

23. On October 5, 2016, the Commission issued public notice of the licensee's Final SPP, establishing a 30-day deadline for filing comments, motions to intervene, and protests. On October 28, 2016, NMFS filed a motion to intervene in the proceeding. On November 3, 2016, the U.S. Department of the Interior (Interior) filed comments on behalf of FWS, indicating that it and NMFS jointly administer the ESA as it applies to federally-listed Gulf of Maine DPS Atlantic salmon. Interior indicated that NMFS is the lead agency for activities at dams and that NMFS had coordinated with FWS regarding the Final SPP.

IV. Endangered Species Act Consultation

24. Section 7(a)(2) of the ESA requires federal agencies to ensure, in consultation with NMFS or FWS as appropriate, that their actions are not likely to jeopardize the continued existence of federally-listed threatened and endangered species, or destroy or

adversely modify critical habitat established for those species.⁶ NMFS is the lead federal agency for Atlantic salmon protection under the ESA in Maine.

25. On March 24, 2016, Commission staff designated the licensee as its non-federal representative to informally consult with NMFS under section 7 of the ESA regarding project effects on federally-listed endangered Gulf of Maine DPS Atlantic salmon. The licensee developed its draft BA and Final SPP in coordination with NMFS and filed it with the Commission on July 6, 2016. The Commission adopted the BA without modification and forwarded it to NMFS on October 14, 2016. Based on the analysis in the BA, the Commission concluded that project operation, including implementation of the Final SPP, may adversely affect federally-listed Atlantic salmon, but would not be likely to adversely modify or destroy the Atlantic salmon critical habitat.

26. In response to the BA, NMFS issued its BO on April 3, 2017. In its BO, NMFS concluded that project operation with the Final SPP may adversely affect, but is not likely to jeopardize, the continued existence of Gulf of Maine DPS Atlantic salmon, and is not expected to result in the destruction or adverse modification of critical habitat.

27. The incidental take statement included with NMFS's 2017 BO contains two reasonable and prudent measures and 13 implementing terms and conditions. The reasonable and prudent measures indicate that the Commission must ensure that the licensee monitors the provisions contained in the Final SPP in a manner that protects federally-listed salmon, and must ensure that the licensee completes annual monitoring and reporting to confirm that it is minimizing incidental take and reporting observations of project-related dead or injured salmon to NMFS.

28. Terms and conditions in incidental take statements are non-discretionary actions that the Commission must comply with in order to be exempt from prohibitions of section 9 of the ESA. The terms and conditions included in the incidental take statement are summarized below, and are attached to this order as Appendix A.

29. To implement reasonable and prudent measure No. 1, the Commission must require the licensee to follow three terms and conditions: (1) prepare a plan with NMFS to study passage and survival of outmigrating salmon smolts, and conduct the study; (2) prepare a plan for NMFS's approval to study adult salmon upstream passage efficiency and downstream passage survival based on certain passage triggers; and (3) operate the project's floodgate at specified times during salmon smolt outmigration two years after each year in which certain triggers occur, in consultation with NMFS, FWS, and Maine DMR.

⁶ 16 U.S.C. § 1536(a) (2006).

30. To implement reasonable and prudent measure No. 2, the Commission must require the licensee to follow 10 additional terms and conditions: (4) inspect upstream and downstream passage facilities daily when in operation, and submit summary reports to NMFS; (5) notify NMFS of any changes in operation including maintenance activities and debris management; (6) immediately remove any debris from passage facilities that could affect the ability of fish to use the facilities; (7) install flashboards within two days after flows recede below the hydraulic capacity of the powerhouse; (8) open upstream passage facilities within 24 hours of when the passage facilities at the Brunswick Project are opened, or by May 1; (9) prepare an operations and maintenance plan for the project's upstream and downstream passage facilities in consultation with NMFS; (10) submit asbuilt drawings to NMFS for the project's current upstream and downstream passage facilities; (11) allow NMFS to inspect project passage facilities; (12) contact NMFS within 24 hours of any interactions with Atlantic salmon; and (13) follow certain steps in the event of any lethal takes, in discussion with NMFS.

31. NMFS included two conservation recommendations in its BO. Conservation recommendations are discretionary agency activities designed to minimize or avoid effects to listed species or critical habitat, help implement recovery plans, or develop information. In the first conservation recommendation, NMFS recommends that the Commission require increased downstream passage protection at the project for diadromous fishes that are not federally listed, such as alewives and blueback herring, because a healthy diadromous fish community is an essential feature of the salmon's designated critical habitat. NMFS includes possible structural and operational methods of improving downstream passage.

32. We understand the importance of the diadromous fish community to salmon and their critical habitat, but we will not require the first recommendation. License Article 35, and the 1998 order already require the licensee to operate the project's fish passage facilities to benefit these species, and to examine the need for further passage studies based on annual consultation with federal and state resource agencies. The annual fish passage status reports the licensee files under these requirements indicate that the facilities are being successfully operated to best pass diadromous fish.

33. In its second conservation recommendation, NMFS recommends that the Commission require the licensee to compensate for unavoidable effects by requiring activities that improve the environmental baseline in the action area, or in the larger Merrymeeting Bay SHRU. NMFS suggests the licensee could remove migration barriers in the Androscoggin River watershed, or construct fishways likely to contribute to the recovery of Atlantic salmon and their designated critical habitat, with focus on the Lower Androscoggin River upstream of the project, and the Little River, which enter the Androscoggin downstream of the project. Because this recommendation is very broad in scope, and involves actions outside of the project area, we will not require the licensee to pursue it.

V. Discussion and Conclusions

34. Implementation of the licensee's July 6, 2016 Final SPP would help protect and enhance federally-listed Atlantic salmon and their critical habitat in the Androscoggin River in the vicinity of the Worumbo Project and would help to ensure compliance with the ESA through the remainder of the current license period. However, as explained below, there is one measure in the Final SPP that we cannot include in our approval. With the exception of that measure, and with inclusion of certain elements in the annual reports to be provided under the plan, as explained below, the licensee's Final SPP should be approved.

35. The Final SPP includes a measure to map salmon habitat and migration barriers in the Little River, which joins the Androscoggin River approximately one-half mile downstream of the project. Mapping would aid in selecting habitat improvement opportunities in the Little River that the licensee could pursue cooperatively with licensees of two downstream hydroelectric projects. Although work in the Little River was identified as a measure in the BA that the Commission forwarded to NMFS to initiate formal consultation under the ESA, review of this measure indicates that our approval of it, as part of the Final SPP, would require actions well outside the project area and without nexus to project effects. This measure is outside the Commission's jurisdiction to enforce and therefore, we cannot approve it as part of the Final SPP. We note that NMFS did not require this work through a mandatory term and condition in its 2017 BO, but rather included it as a conservation recommendation. Although we are not including this work in our approval of the Final SPP, we have no objection to the licensee pursuing this work in cooperation with NMFS independent of its Commission license.

36. The licensee proposes to prepare annual reports with the resource agencies that would review the previous year's activities under the Final SPP, including any need to continue or modify future activities including studies of upstream and downstream passage of federally-listed salmon, and provide the reports to agencies and the Commission by the end of March the following year. To keep the Commission apprised of progress in implementing the measures in the Final SPP, the licensee should include in its annual Final SPP reports: (1) a summary of operation of project fish passage facilities for passage of Atlantic salmon; (2) a summary of Atlantic salmon passage monitoring and studies that are conducted or may be conducted during the term of the Final SPP; (3) a summary of anticipated schedules associated with the elements of the Final SPP; (4) descriptions of any issues that arise that may affect the timely completion of elements in the Final SPP, and how the issues are being addressed; and (5) a summary of consultation with NMFS and other resource agencies regarding progress under the Final SPP and any pertinent issues regarding protection of Atlantic salmon at the project and compliance with the terms and conditions of NMFS's 2017 BO. The licensee should prepare the annual Final SPP reports each year in coordination with NMFS, FWS, and Maine DMR, and then file the reports with the Commission by March 31 of the following

year. The first annual Final SPP report, for 2018, should be filed by March 31, 2019. Copies of each completed report should be provided to NMFS, FWS, and Maine DMR at the same time they are filed with the Commission. Paragraph (B) of this order requires the filing of these reports.

37. The licensee also proposes to eliminate redundancy by including in the annual Final SPP reports information on consultation and fish passage and protection that it now files in annual fish passage status reports pursuant to the 1998 order. The annual passage reports include information on passage of fish other than federally-listed salmon, such as American shad and alewife, and resident riverine fishes. We agree with this proposal, noting that such coordination may benefit fisheries management and provide an overall benefit to fish passage at the project. Therefore, paragraph (C) of this order deletes the separate filing requirement and requires the information currently included in the annual fish passage status reports to be included in the annual Final SPP reports.

38. Under the Final SPP and the terms and conditions of NMFS's 2017 BO, the licensee will perform studies of passage of Atlantic salmon at the project. The Commission must review and approve final plans and schedules for such studies prior to their initiation to ensure that they are consistent with Commission regulations. Therefore, paragraph (D) of this order requires that plans and schedules for such studies be filed for Commission approval prior to initiation the studies.

39. The licensee must follow the terms and conditions included in NMFS's 2017 BO to ensure exemption from the take prohibitions of Section 9 of the ESA through the remainder of the current license period. Therefore, the terms and conditions, which are attached to this order as Appendix A, are incorporated into the license for the Worumbo Project through paragraph (E).

40. The terms and conditions in NMFS's 2017 BO include requirements for the licensee to contact NMFS under certain circumstances, including interactions with Atlantic salmon. To keep the Commission informed of any incidental take of Atlantic salmon at the project, paragraph (F) of this order requires the licensee to inform Commission staff, via telephone or email, as soon as possible after contacting NMFS regarding any issue pursuant to the terms and conditions. The licensee should then file a written report on the issue with the Commission within 15 days.

The Director orders:

(A) Brown Bear II Hydro, Inc.'s (licensee) Final Species Protection Plan for the Worumbo Project filed July 6, 2016, is approved, excluding the measure that requires mapping of Atlantic salmon habitat and migration barriers in the Little River.

(B) The licensee must file annual Final Species Protection Plan (Final SPP) reports with the Commission. Each annual Final SPP report must include, at minimum,

the following information: (1) a summary of operation of project fish passage facilities for passage of Atlantic salmon; (2) a summary of Atlantic salmon passage monitoring and studies that are conducted or may be conducted during the term of the Final SPP; (3) a summary of anticipated schedules associated with the work in the Final SPP; (4) descriptions of any issues that arise that may affect the timely completion of the elements in the Final SPP, and how the issues are being addressed; and (5) a summary of consultation with the National Marine Fisheries Service (NMFS) and other resource agencies regarding progress under the Final SPP and any pertinent issues regarding protection of Atlantic salmon at the project and compliance with the terms and conditions of NMFS's April 3, 2017 Biological Opinion. The licensee must prepare the annual Final SPP reports each year in coordination with NMFS, the U.S. Fish and Wildlife Service (FWS), and the Maine Department of Marine Resources (Maine DMR), and then file the reports with the Commission by March 31 of the following year. The first annual Final SPP report, for 2018, must be filed by March 31, 2019. Copies of the completed annual Final SPP reports must be provided to NMFS, FWS, and Maine DMR at the same time they are filed with the Commission.

(C) The annual Final SPP reports required in paragraph (B) above must include information previously included in the annual fish passage status reports pursuant to the Commission's November 12, 1998 Order Approving Fish Passage Studies. The requirement to file annual fish passage status reports separately pursuant to the 1998 Order is therefore deleted.

(D) Prior to the start of any new studies of Atlantic salmon passage at the Worumbo Project, the licensee must file plans and schedules for the studies with the Commission, for approval, prior to the start of such studies. The plans and schedules must be accompanied by evidence of approval by the National Marine Fisheries Service, and copies of comments and recommendations from the U.S. Fish and Wildlife Service and Maine Department of Marine Resources, or evidence that these agencies were given at least 30 days to provide comments and recommendations and chose not to do so. If the licensee does not adopt an agency recommendation, the plans must include the licensee's reasons, based on site-specific information.

(E) The terms and conditions of the incidental take permit included with the National Marine Fisheries Service's April 3, 2017 Biological Opinion are hereby incorporated into the license for the Worumbo Project. The terms and conditions are attached to this order as Appendix A.

(F) The licensee must inform Commission staff, via telephone or email, as soon as possible after contacting the National Marine Fisheries Service (NMFS) regarding any issue pursuant to the terms and conditions of the incidental take statement included with the NMFS April 3, 2017 Biological Opinion. The licensee must then file a written report on the issue with the Commission within 15 days of the issue.

(G) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the Federal Power Act, 16 U.S.C. § 825*l* (2012), and the Commission's regulations at 18 C.F.R. § 385.713 (2017). The filing of a request for rehearing does not operate as a stay of the effective date of this order, or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

Steve Hocking, Chief Environmental and Project Review Branch Division of Hydropower Administration and Compliance

APPENDIX A

DEPARTMENT OF COMMERCE NATIONAL MARINE FISHERIES SERVICE

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS OF THE INCIDENTAL TAKE STATEMENT INCLUDED IN THE BIOLOGICAL OPINION FOR THE WORUMBO PROJECT (FERC NO. 3428)

Issued April 3, 2017

Reasonable and Prudent Measures

- 1. FERC must ensure, through enforceable conditions of the Project license, that the licensee measure and monitor the provisions contained in the October 14, 2016 Species Protection Plan (SPP) in a way that is adequately protective of listed Atlantic salmon.
- 2. FERC must ensure, through enforceable conditions of the Project licenses, that the licensee complete an annual monitoring and reporting program to confirm that they are minimizing incidental take and reporting all project-related observations of dead or injured salmon to us.

Terms and Conditions

To implement reasonable and prudent measure #1, FERC must require Brown Bear to do the following:

- 1. Prepare in consultation with NMFS a plan to study the passage and survival of migrating smolts at the Worumbo Project to be conducted two years after the first time two or more Atlantic salmon are passed upriver of the Project in a single year. If the requisite number of salmon do not pass upriver of the Project prior to the end of the SPP duration, then Brown Bear should conduct the study in 2025, as proposed. The need for a study will be confirmed in annual consultation with NMFS, USFWS, and MDMR.
 - a. Require Brown Bear to measure the survival of downstream migrating Atlantic salmon smolts at the Worumbo Project using a scientifically acceptable methodology.

- i. Measure the survival of downstream migrating smolts approaching within 200 meters of the trashracks downstream to the point where delayed effects of passage can be quantified. Brown Bear must coordinate with NMFS in selecting an adequate location for the downstream receivers.
- ii. ii. A Cormack-Jolly-Seber (CJS) model, or other acceptable approach, must be used to determine if the survival estimate and associated error bounds are within the scope of published telemetry work for salmon in the region.
- iii. Brown Bear must consult with NMFS concerning the application of appropriate statistical methodology and must provide an electronic copy of model(s) and data to NMFS.
- b. All tags released in the system should have codes that are not duplicative of tags used by other researchers in the river, including university, state, federal and international tagging programs.
- 2. Prepare, in consultation with NMFS, and for NMFS review and approval, a plan to study adult salmon upstream passage efficiency and downstream survival at the Project following two consecutive years of 40 or more pre-spawn Atlantic salmon (regardless of origin) being released upriver of the Brunswick Project.
- 3. Operate floodgate # 1 during the smolt outmigration period when smolts could be outmigrating (i.e. two years after each year when two or more adult sea-run Atlantic salmon have passed upstream of the Project). The need for floodgate operation will be confirmed in annual consultation with NMFS, USFWS, and MDMR. The floodgate should be operated at night (12-hour period between 7:00pm and 7:00am) for at least a four week period following the date in the spring when the daily average river temperature at the Project exceeds 10° Celsius.

To implement reasonable and prudent measure #2, FERC must require Brown Bear to do the following:

- 4. Inspect the upstream and downstream fish passage facilities at the Project daily when they are open. The licensee must submit summary reports to NMFS weekly during the fish passage season.
- 5. Notify NMFS of any changes in operation including maintenance activities and debris management at the project during the term of the amended license.

- 6. Remove any debris that could affect the ability of fish to pass either the downstream or upstream fish passages immediately upon inspection.
- 7. Install flashboards within two days after flows recede below the hydraulic capacity of the powerhouse.
- 8. Open the upstream fishway within 24 hours of the opening of the Brunswick upstream fishway or by May 1, whichever comes first.
- 9. Prepare an Operations and Maintenance plan for the upstream and downstream fishways in consultation with NMFS. The Operations and Maintenance plan should be reviewed each year with NMFS and the licensee and updated to accurately reflect any changes in operation and upcoming maintenance scheduling.
- 10. Submit as-built drawings to NMFS for the current configuration of the upstream and downstream fishways.
- 11. Allow NMFS to inspect the upstream and downstream fishways at reasonable times, including but not limited to annual engineering inspection.
- 12. Contact NMFS within 24 hours of any interactions with Atlantic salmon, including non-lethal and lethal takes (Matt Buhyoff: by email (<u>Matt.Buhyoff@noaa.gov</u>) or phone (201& 866-4238 and to: incidental.take@noaa.gov.
- 13. In the event of any lethal takes, any dead specimens or body parts must be photographed, measured, and preserved (refrigerate or freeze) until disposal procedures are discussed with NMFS.

UNITED STATES OF AMERICA BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

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Brown Bear II Hydro, Inc.

Project No. 3428-171

REQUEST FOR CLARIFICATION OR, IN THE ALTERNATIVE, REHEARING OF BROWN BEAR II HYDRO, INC.

Pursuant to Section 313 of the Federal Power Act ("FPA"), 16 U.S.C. § 8251 (2012), and Rule 713 of the Federal Energy Regulatory Commission's ("Commission") Rules of Practice and Procedure, 18 C.F.R. § 385.713 (2016), Brown Bear II Hydro, Inc. ("Brown Bear") respectfully requests clarification or, in the alternative, rehearing of certain aspects of the Commission's May 11, 2018 order approving a Final Species Protection Plan ("Final SPP") for the Worumbo Hydroelectric Project ("Worumbo Project" or "Project").¹

I. INTRODUCTION

The Commission licensed the Worumbo Project, located on the Androscoggin River in Androscoggin County, Maine, on December 24, 1985 and granted the licensee a 40-year license term.² The Worumbo Project has upstream and downstream fish passage facilities, which were designed and constructed pursuant to license Article 34. Upstream passage facilities include a cable-operated vertical lift system with two downstream entrances, a fish-counting room and viewing window, and an exit canal leading to the reservoir. Downstream passage facilities include three entrance gates with trash racks located at the surface of the reservoir, a connecting gallery, a downstream passage pipe, and a plunge pool with a depth controlled by two sectional gates.

¹ Brown Bear II Hydro, Inc., 163 FERC ¶ 62,091 (2018) ("May 11 Order").

² *Miller Hydro Group, Inc.*, 33 FERC ¶ 62,430 (1985).

Pursuant to an Interim Species Protection Plan ("Interim SPP") approved by the Commission on May 31, 2013,³ Brown Bear committed to study the existing upstream and downstream salmon passage at the Worumbo Project for three years. Further, in cooperation with National Marine Fisheries Service ("NMFS") and U.S. Fish and Wildlife Service, Brown Bear was directed to use the study to identify improvements to the fish passage facilities and process and to develop a Final Species Protection Plan ("Final SPP"). Prior to finalization of the Final SPP, on March 24, 2016, Commission staff designated the licensee as its non-federal representative to informally consult with NMFS under Section 7 of the Endangered Species Act ("ESA") regarding project effects on federally-listed endangered Gulf of Maine DPS Atlantic salmon.

On July 6, 2016, Brown Bear filed for Commission approval a Final SPP for the Worumbo Project. The Final SPP is attached to a draft Biological Assessment ("BA") that Brown Bear developed in consultation with NMFS under the ESA. The Final SPP would be in effect for the remainder of the license term, which expires on November 30, 2025, until a new license is issued for the Project. The Final SPP describes measures that Brown Bear will take to avoid and minimize impacts to federally-listed endangered Atlantic salmon during operation of the project. The Commission adopted the BA without modification and forwarded it to NMFS on October 14, 2016. Based on the analysis in the BA, the Commission concluded that project operation, including implementation of the Final SPP, may adversely affect federally-listed Atlantic salmon, but would not be likely to adversely modify or destroy the Atlantic salmon critical habitat.

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Miller Hydro Group, Inc., 143 FERC ¶ 62,162 (2013).

In response to the BA, NMFS issued its Biological Opinion ("BO") on April 3, 2017. In its BO, NMFS concluded that project operation with the Final SPP may adversely affect, but is not likely to jeopardize, the continued existence of Gulf of Maine DPS Atlantic salmon and is not expected to result in the destruction or adverse modification of critical habitat. The incidental take statement included with NMFS' BO contains two reasonable and prudent measures and 13 implementing terms and conditions. The reasonable and prudent measures indicate that the Commission must ensure that Brown Bear monitors the provisions contained in the Final SPP in a manner that protects federally-listed salmon, and must ensure that Brown Bear completes annual monitoring and reporting to confirm that it is minimizing incidental take and reporting observations of project-related dead or injured salmon to NMFS.

II. SPECIFICATION OF ERRORS

In accordance with Rule 713(c)(1) of the Commission's Rules of Practice and Procedure, Brown Bear specifies the following errors in the Commission's May 11 Order:

- The Commission erred by adopting a term and condition from the incidental take statement that fails to ensure the protection of human life and safety in requiring the removal of any debris that could affect the ability of fish to pass either the downstream or upstream fish passages "immediately upon inspection."
- The Commission erred by adopting a term and condition from the incidental take statement that fails to ensure the protection of human life and safety in requiring the installation of flashboards "within two days after flows recede below the hydraulic capacity of the powerhouse."
- The Commission erred by adopting a term and condition from the incidental take statement that fails to ensure the protection of human life and safety in requiring the opening of the upstream fishway "within 24 hours of the opening of the Brunswick upstream fishway or by May 1, whichever comes first."

III. STATEMENT OF ISSUES

In accordance with Rule 713(c)(2) of the Commission's Rules of Practice and

Procedure, Brown Bear provides the following Statement of Issues as to the May 11

Order:

- The Commission erred by adopting a Term and Condition that fails to address safety concerns when directing that any debris that could affect the ability of fish to pass either the downstream or upstream fish passages be removed "immediately upon inspection." *Ne. Util. Serv. Co. v. FERC*, 993 F.2d 937, 944 (1st Cir. 1993) (holding that reasoned decision making requires "a reasoned explanation supported by a stated connection between the facts found and the choice made") (citation omitted); *Motor Vehicle Mfrs. Ass'n. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) ("[T]he agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.").
- The Commission erred by adopting a Term and Condition that fails to address safety concerns when directing that flashboards be installed within two days after flows recede below the hydraulic capacity of the powerhouse. *Ne. Util. Serv. Co. v. FERC*, 993 F.2d 937, 944 (1st Cir. 1993) (holding that reasoned decision making requires "a reasoned explanation supported by a stated connection between the facts found and the choice made") (citation omitted); *Motor Vehicle Mfrs. Ass'n. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) ("[T]he agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.").
- The Commission erred by adopting a Term and Condition that ignores record evidence and fails to address safety concerns when requiring the opening of the upstream fishway within 24 hours of the opening of the Brunswick upstream fishway or by May 1, whichever comes first. 5 U.S.C. § 706(2)(E) ("The reviewing court shall ... hold unlawful and set aside ... findings ... found to be ... unsupported by substantial evidence."); *Natural Res. Def. Council, Inc. v. US EPA*, 822 F.2d 104, 111 (D.C. Cir. 1987) (holding agency action is "arbitrary and capricious" if it "ignores important arguments or evidence"); *Cosmopolitan Broad. Corp. v. FCC*, 581 F.2d 917, 930 (D.C. Cir. 1978) (holding that an agency cannot ignore evidence placed before it); *Ill. Commerce Comm'n v. FERC*, 576 F.3d 470, 477 (7th Cir. 2009) (holding that a reviewing court cannot "uphold a regulatory decision that is not supported by substantial evidence on the record as a whole").

IV. REQUEST FOR REHEARING

In its May 11 Order, the Commission adopted the reasonable and prudent

measures, and accompanying terms and conditions, from the BO produced by NMFS.

The two reasonable and prudent measures would require the Commission to

ensure that the licensee monitors the provisions contained in the Final SPP in a manner that protects federally-listed salmon, and must ensure that the licensee completes annual monitoring and reporting to confirm that it is minimizing incidental take and reporting observations of project-related dead or injured salmon to NMFS.⁴

The following are the 10 terms and conditions that the Commission must require Brown

Bear to follow in order to implement the second reasonable and prudent measure (with

numbering preserved from the May 11 Order and the BO):

- 4. Inspect the upstream and downstream fish passage facilities at the Project daily when they are open. The licensee must submit summary reports to NMFS weekly during the fish passage season.
- 5. Notify NMFS of any changes in operation including maintenance activities and debris management at the project during the term of the amended license.
- 6. Remove any debris that could affect the ability of fish to pass either the downstream or upstream fish passages immediately upon inspection.
- 7. Install flashboards within two days after flows recede below the hydraulic capacity of the powerhouse.
- 8. Open the upstream fishway within 24 hours of the opening of the Brunswick upstream fishway or by May 1, whichever comes first.
- 9. Prepare an Operations and Maintenance plan for the upstream and downstream fishways in consultation with NMFS. The Operations and Maintenance plan should be reviewed each year with NMFS and the licensee and updated to accurately reflect any changes in operation and upcoming maintenance scheduling.
- 10. Submit as-built drawings to NMFS for the current configuration of the upstream and downstream fishways.
- 11. Allow NMFS to inspect the upstream and downstream fishways at reasonable times, including but not limited to annual engineering inspection.
- 12. Contact NMFS within 24 hours of any interactions with Atlantic salmon, including nonlethal and lethal takes (Matt Buhyoff: by email

⁴ May 11 Order at P 27.

(Matt.Buhyoff@noaa.gov) or phone (201& 866-4238 and to: incidental.take@noaa.gov.

13. In the event of any lethal takes, any dead specimens or body parts must be photographed, measured, and preserved.⁵

With this pleading, Brown Bear confirms its willingness and ability to comply with these directives. Nevertheless, Brown Bear seeks clarification, or in the alternative, rehearing regarding Terms and Conditions #6, #7, and #8. As detailed below, Brown Bear has concerns that these Terms and Conditions ignore the potential danger to human life and safety and request that the Commission condition or modify these terms and conditions.

A. Requiring the Removal of Debris "Immediately Upon Inspection" Poses a Considerable Hazard to Human Life and Safety.

Term and Condition #6 requires the Commission to direct Brown Bear to "[r]emove any debris that could affect the ability of fish to pass either the downstream or upstream fish passages immediately upon inspection." Brown Bear acknowledges that debris could impede the ability of fish to pass either the downstream or upstream fish passages as well as its responsibility in ensuring that no such debris could defeat the purposes for which the Worumbo Project fish passage facilities were designed and built. Nevertheless, the strictest interpretation of this requirement would imperil the safety and lives of the operators of the Worumbo Project.

The upstream and downstream fishways at Worumbo are inspected daily. Removal of debris impacting the downstream fishway involves inspecting and cleaning two project components—the inlet trash racks and the downstream collection area. The inlet trash racks are inspected on a daily basis and cleaned as needed. Once the trash racks are cleaned, the operators inspect the water level in the lower plunge area for low

⁵ *Id.*, Appendix A.

water levels indicating that the downstream collection area must also be cleared out. Prior to commencing this work, there are two conditions that must be satisfied:

- The station pond level must be below 99.0 ft. mean sea level.
- The area must pass the confined space entry requirements before anyone can enter this space.

Unless these conditions are satisfied, attempting to remove debris from the downstream facility would be dangerous to the Worumbo Project operators.

The upstream fish lift system is also inspected daily, with floating surface debris removed as needed. During the fall, the system typically is secured, drained, and cleaned up to two or more times per week, based on the amount of leaves in the river. Any time the fish lift system is secured due to high flows, the upper area is drained, inspected, and cleared of debris before restarting the system. The system is restarted once the river flows drop to below 10,000 cubic feet per second ("cfs").

As demonstrated above, Brown Bear has a systematic protocol for cleaning the debris from the upstream and downstream fish passage facilities. These protocols account for limitations on the ability to perform debris removal, limitations that are specifically related to system design and environmental conditions outside Brown Bear's control and are dictated by a concern for human safety and the protection of human life. Strict adherence to Term and Condition #6 in the incidental take statement, however, could pose a danger to the safety and lives of the operators at the Worumbo Project. Term and Condition #6 would require Brown Bear to remove debris affecting the ability of fish to use the downstream and upstream fish passage facilities "immediately upon inspection" of such debris. As discussed above, the fish passage facilities are inspected on a daily basis. This means that they are also inspected during times of high flood water events. Removal of debris during normal high-water events is impractical or impossible

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and certainly would pose a significant threat to the safety of the Worumbo personnel charged with this task. But the requirement to remove debris immediately would also include not only high-water events but also storms. For all practical purposes, Term and Condition #6 would require Worumbo personnel to remove debris during a significant storm such as Hurricane Sandy or another similarly perilous extreme weather event.

Brown Bear does not believe that either the Commission or NMFS intended that Worumbo personnel risk their personal safety or lives to perform debris removal. For that reason, Brown Bear asks that the Commission clarify the May 11 Order, either singly or jointly with NMFS, by revising Term and Condition #6 to include a caveat that such removal be performed immediately once environmental conditions permit the work to be done in a safe manner, rather than "immediately upon inspection":

> "Remove any debris that could affect the ability of fish to pass either the downstream or upstream fish passages immediately after environmental and weather conditions permit such work to commence in a safe manner."

Brown Bear believes that such a modification is in keeping with the spirit of the BO and will provide protection to the federally-listed endangered Atlantic salmon. To the extent that the Commission declines to exercise its discretion to revise the May 11 Order, Brown Bear seeks rehearing.

B. Requiring the Installation of Flashboards Within Two Days After Flows Recede Below The Hydraulic Capacity of the Powerhouse Poses a Considerable Hazard to Human Life and Safety and Imposes Conflicting Regulatory Requirements.

As acknowledged in the BO,⁶ sections of the concrete gravity dam included in the

Worumbo Project are equipped with either mechanical or pneumatic flashboard systems.

⁶ NMFS, Endangered Species Act Biological Opinion for Proposed Amendment of the License for the Worumbo Project (P-3428), at 7-9 (Apr. 3, 2017) (FERC Accession No. 20170403-5553) ("BO"), *available* <u>here</u>.
The BO describes the mechanical flashboard system in the following terms:

The top of the hinged flashboard systems are at elevation 99.0 feet and are operated on a non-overflow basis under normal operating conditions. These flashboards will fail when overtopped under high flow conditions. Overtopping flow will continue thereafter until river flows recede to a point that the flashboards can be manually reset, and normal operating conditions can resume.⁷

As demonstrated above, the hinged flashboards must be manually reset after failing.

Though the BO notes that water flow must be reduced "to a point that the flashboards can be manually reset," it does not provide any discussion as to a specific level at which this can be accomplished or, for that matter, accomplished in a safe manner. Ultimately, the BO determines this water flow level to be when flows are reduced to below the Worumbo Project's hydraulic capacity, as Term and Condition #7 requires the Commission to direct Brown Bear to "[i]nstall flashboards within two days after flows recede below the hydraulic capacity of the powerhouse." Brown Bear has three concerns with Term and Condition #7.

First, Term and Condition #7 raises significant safety concerns. The question of the appropriate water flow level at which Worumbo Project operators could safely manually reset the flashboards has previously been investigated by Brown Bear. The Commission amended the license for the Worumbo Project to authorize raising the normal operating level of the reservoir with the installation of both the pneumatic and mechanical flashboard.⁸ Prior to submitting the license amendment application proposing to raise the reservoir's operating level, Brown Bear engaged an engineering company in 1995 to study the feasibility of the proposal.

⁷ *Id.* at 9.

⁸ *Miller Hydro Group, Inc.*, 84 FERC ¶ 62,137 (1998).

As a part of the study, the engineering company calculated the amount of time between a station trip alerting those working on the dam of the incoming water and when water first starts flowing over the crest of the dam. The engineering company determined, at various river flows, the range of inflows at which workers could safely move themselves and their equipment off the dam in the event of an emergency. Based on this study, Brown Bear developed an internal safety protocol directing that operators not attempt to access the top of the dam, including resetting flashboards, unless two conditions were met:

- Station inflow must be 5,000 cfs or below and
- Reservoir level must be lowered to six inches below the crest of the dam, with the approval of the Maine Department of Inland Fisheries and Wildlife ("MDIFW").

Brown Bear has abided by this safety protocol since developing it in 1995, declining to reset the flashboards until these conditions are met.

In addition to these specific safety concerns related to work at the crest of the dam, Brown Bear echoes the concern expressed above in relation to the removal of debris that, at times, environmental conditions and extreme weather events do not permit certain maintenance work to be performed in a safe manner. Term and Condition #7 does not permit any discretion to the licensee to decline to perform work due to challenging or life-threatening emergency conditions.

Second, Brown Bear also has concerns that Term and Condition #7 appears to impose a conflicting regulatory obligation. Article 31, as amended,⁹ requires that Brown Bear maintain specific minimum flow releases for the protection and enhancement of fisheries resources. Lowering the reservoir level in order to install flashboards will result in a deviation from those Article 31 requirements. Article 31 provides that minimum

⁹ *Miller Hydro Group, Inc.*, 66 FERC ¶ 62,041 (1994).

flows may be temporarily modified if authorized in advance by MDIFW. For this reason, the second criteria identified above includes a role for the MDIFW in determining reservoir levels at which flashboards may be reset. Brown Bear believes that maintaining the role of MDIFW in overseeing the Worumbo Project as well as its reservoir levels and minimum flows is important. Obtaining MDIFW approval of deviations in reservoir levels or minimum flows is a requirement of the Worumbo license. Ultimately, Brown Bear has concerns that adoption of Term and Condition #7 is directing operations that could conflict with license obligations.

Third, in imposing a temporal requirement to the installation of flashboards ("within two days" of the trigger inflow requirement being met), Term and Condition #7 ignores the staffing level difficulties inherent in this enterprise. Installing flashboards is labor-intensive and requires a crew of at least three individuals. Through its affiliates, Brown Bear has access to additional, high-quality and well-trained personnel experienced in hydropower operations. Coordinating schedules to reset flashboards can be challenging because these personnel are pulled off other hydropower projects on which they work. Moreover, if a regional storm is affecting Worumbo, it will be affecting operators of other local hydropower projects, potentially making it difficult to reinstall the flashboards within two days, as required by Term and Condition #7. Certainly, Brown Bear has a clear interest in installing the flashboards as soon as possible and in complying with this Term and Condition #7, but it acknowledges the logistical problems that this requirement imposes.

With the Worumbo Project powerhouse having a hydraulic capacity of 9,040 cfs, Term and Condition #7 would require that the flashboards be reset when flows recede

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below this level.¹⁰ Yet, as demonstrated by the engineering study performed in 1995 and the resulting safety protocols adopted by Brown Bear, personnel working on the dam with inflows even above 5,000 cfs, let alone at 9,000 cfs, are risking their own personal safety.

Consistent with the discussion above, Brown Bear does not believe that either the Commission or NMFS have intentionally disregarded the safety of the Worumbo personnel that will manually install the flashboards. Such information was not in the record at the time of the issuance of the BO or of the May 11 Order. Accordingly, Brown Bear asks that the Commission clarify the May 11 Order, either singly or jointly with NMFS, by revising Term and Condition #7 to include a caveat that such removal work be performed once environmental, weather, and safety conditions permit the work to be done in a safe manner and with all necessary regulatory approvals, rather than "immediately upon inspection":

> "Install flashboards once flows recede below 5,000 cubic feet per second into the powerhouse and after licensee has obtained all necessary regulatory approvals and environmental and weather conditions permit such work to commence in a safe manner."

Brown Bear advocates for such a modification despite the fact that a delay in the installation of flashboards will result in reduced generation and therefore reduced revenues. Brown Bear believes that the upstream and downstream fish passage facilities can be operated to the satisfaction of NMFS and in protection of federally-listed endangered Atlantic salmon with this accommodation. To the extent that the

¹⁰ The hydraulic capacity of the powerhouse does not include the 346 cfs necessary to operate the downstream fish passage and dam spillage facility or the 30 cfs necessary to operate the upstream fish passage facility. In total, this is 9,416 cfs.

Commission declines to exercise its discretion to revise the May 11 Order, Brown Bear seeks rehearing.

C. Requiring the Upstream Fishway to Commence Operations Concurrently with the Fish Passage Facilities at the Downstream Brunswick Project or, at Latest, by May 1st Ignores the Existing Record as to When the Upstream Fishways of Downstream Projects Historically Commence Operations and Disregards Safety Concerns.

The Worumbo Project is located upstream of two other Commission-licensed hydroelectric projects with fish passage facilities on the Androscoggin River, and Atlantic salmon are documented to use the upstream fish passage of each project. Atlantic salmon traveling upstream first encounter the Brunswick Project. Once passed above the Brunswick Project, Atlantic salmon encounter the Pejepscot Project before arriving at the Worumbo Project. In evaluating Brown Bear's proposed Final SPP, NMFS also concurrently evaluated species protection plans for these projects.

Term and Condition #8 requires the Commission to direct Brown Bear to "[o]pen the upstream fishway within 24 hours of the opening of the Brunswick upstream fishway or by May 1, whichever comes first." Brown Bear appreciates the fact that NMFS undertook a consolidated review of the impact on federally-listed Atlantic salmon of the fish passage facilities operated as a part of the three Commission-licensed hydroelectric projects on the Androscoggin River. Further, Brown Bear agrees that a coordinated approach among the projects is in the best interests of the federally-listed species. Brown Bear questions, however, the specific trigger established by Term and Condition #8 as well as the wisdom of specifying an artificial deadline of May 1st for initiating operations of the Worumbo upstream fishway system.

Brown Bear suggests that the commencement date for operations of the upstream fishway should be keyed to the date that fish are passed into the Brunswick head pond,

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rather than when Brunswick commences operations. As indicated in the Final SPP, Brown Bear has historically operated its fish passage facilities in concert with the Brunswick upstream fish passage facility and with relevant state agencies. By practice, Brown Bear has "opened the upstream fishway upon notice from [Maine Department of Marine Resources] that the upstream migratory fish run has begun at the Brunswick fishway. This notification normally took place early to mid-May."¹¹ Brown Bear supports continuation of this coordinated approach but believes the more appropriate trigger for commencement of operations of the Worumbo upstream fishway is the date that it is informed by the Maine Department of Marine Resources ("MDMR") that fish are passed into the Brunswick head pond. This trigger would place an official government agency with relevant expertise—MDMR—at the center of determining when operations should commence at the Worumbo fishway system. As demonstrated above, this is a role that MDMR currently fulfills. Further, fish entering the Brunswick head pond is a better trigger than the commencement of operations at Brunswick because operation of the fish passage system results in the inevitable wear-and-tear on the facility equipment and operating the system without fish utilizing the system would put unnecessary stress on the equipment.

Further, and in addition to the concern about the trigger for commencement of operations for the Worumbo fishway facility, Brown Bear questions the rationale for establishing an artificial deadline for commencement of operations. In recent years, the date that the Brunswick Project has been able to commence operations has been pushed back due to environmental concerns, oftentimes due to high spring run-off or a late ice

¹¹ Brown Bear II, Hydro, Inc., Draft Biological Assessment for Gulf of Maine Distinct Population Segment of Atlantic Salmon, at 17 (July 2016) (FERC Accession No. 20160706-5083), available here; see also BO at 11.

thaw. In addition, particularly high water level events from spring run-off have prevented Brown Bear from dewatering the fish passage facilities at Worumbo for inspection prior to commencing operations. Thus, environmental conditions often dictate the timeframe within which the facility may become operational.

In the chart below, Brown Bear provides recent historical data on the dates that its fish passage commenced operations due to passing fish in the Brunswick head pond:

Year	Commencement of Worumbo Fish Passage
2018	5/17/18
2017	5/22/17
2016	4/21/16 (with first migrating fish passing on 5/19/16) ¹²
2015	5/12/15
2014	5/14/14

Overall, as evidenced in the chart above, fish have consistently passed into the Brunswick head pond in mid-May. Most years, environmental conditions simply did not permit an earlier commencement date.

Based on this historical record, Brown Bear questions the need to establish an artificial deadline for commencement of operations that is not tied to the fishway facilities at Brunswick. Nevertheless, if the Commission and NMFS would prefer to establish a secondary deadline for the commencement of operations at the Worumbo fish

¹² Beginning in 2016, following the creation of the SPP, Brown Bear commenced operations when Brunswick started on April 21st. Yet, as shown in the chart, the first fish passed the Worumbo system nearly a month later on May 19th. In 2017 and 2018, Brown Bear sought and received waivers from MDMR not to commence upstream fish passage operations until MDMR notified Brown Bear.

passage facility that is not triggered by the Brunswick Project fish passage facility, Brown Bear suggests that this date be fixed as May 15th. This date is more representative of the environmental conditions that often dictate when operations of the fish passage facilities may commence.

Finally, Brown Bear again echoes the concern expressed above in relation to Terms and Conditions #6 and #7 that, at times, environmental conditions and extreme weather events may not permit the opening of the Worumbo fishway system. Consistent with the discussion above in relation to Terms and Conditions #6 and #7, Term and Condition #8 should incorporate a safety element to ensure that the fishway system will be opened only if it can be done in a safe manner.

For these reasons, Brown Bear seeks clarification or, in the alternative, rehearing of the May 11 Order and asks that the Commission, either singly or jointly with NMFS, revise Term and Condition #8 to remove the artificial deadline for commencement of operations of the Worumbo Project:

> "Open the upstream fishway within 24 hours of receiving notice from the Maine Department of Marine Resources that fish have passed the Brunswick upstream fishway and have entered the Brunswick head pond after environmental and weather conditions permit such work to commence in a safe manner."

Alternatively, Brown Bear requests that, if establishing a date certain as an alternative deadline for commencing operations of the upstream fishway at Worumbo be necessary, that the Commission append to Term and Condition #8 the phrase "or by May 15, whichever comes first."

V. CONCLUSION

Brown Bear supports the efforts of the Commission and NMFS to avoid and minimize impacts to federally-listed endangered Atlantic salmon and pledges its full cooperation in this endeavor. Brown Bear appreciates the obligations it has assumed under the license for the Worumbo Project, the May 11 Order, and the BO, and it seeks clarification or, in the alternative, rehearing in keeping with this understanding. Brown Bear also acknowledges the important role its operators play in maintaining and operating the Worumbo Project and seeks clarification/rehearing in order to ensure that it can maintain a safe workplace for its operating personnel.

In this pleading, Brown Bear has raised concerns with several of the terms and conditions contained within the incidental take statement that the Commission adopted in its May 11 Order because they do not address safety concerns or otherwise do not appear to be supported by the evidence. Brown Bear has herein identified the concerns and ambiguities that need to be resolved in order to ensure both that it has the clarity and assurance it needs to reliably and safely operate the Worumbo Project and that the objectives identified by NMFS are achieved. Accordingly, Brown Bear urges the Commission to grant clarification or, in the alternative, rehearing of its May 11 Order adopting the terms and conditions included in the incidental take statement issued by NMFS consistent with the above discussion.

Dated: June 11, 2018

Respectfully submitted,

<u>/s/ Donald H. Clarke</u> Donald H. Clarke Joshua E. Adrian Duncan, Weinberg, Genzer & Pembroke, P.C. 1615 M Street, N.W., Suite 800 Washington, D.C. 20036

Attorneys for Brown Bear II Hydro, Inc.

CERTIFICATE OF SERVICE

Pursuant to Rule 2010 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.2010 (2018), I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Washington, DC, this 11th day of June, 2018.

/s/ Harry A. Dupre

Harry A. Dupre Duncan, Weinberg, Genzer & Pembroke, P.C. 1615 M Street, N.W., Suite 800 Washington, D.C. 20036 (202) 467-6370

APPENDIX H

PUBLIC SAFETY PLAN

WORUMBO HYDRO PROJECT

PUBLIC SAFETY PLAN F.E.R.C. PROJECT NO. 3428-ME

REVISED NOVEMBER 1, 2017

At the present time, the public safety program at the Worumbo Project consists of the following:

- Lift rings attached by 100-ft lengths of rope on the inlet deck and near the tail race.
- A seasonal boat barrier across the full width of the river 300 yards upstream from the dam and 325 yards upstream from the power house. There are three warning signs equally spaced along the barrier. A second length of boat barrier extends just offshore along the Lisbon side of the river from the first boat barrier to the canoe portage take-out point creating a channel for canoeists to follow. The barrier system is in place during the recreational boating season, June 1st to October 1st.
- The electrical switch yard on the outlet deck of the powerhouse is surrounded by a ninefoot fence topped with barbed wire. The entire station area is surrounded by eight-foot chain link fence.
- A vehicle barrier is in place at the entrance to the access path to the Durham side of the river.
- The new road for access to the Durham end of the dam, added during the replacement dam project in 2011, is gated in order to prevent unauthorized vehicular entry.
- Signage is provided as follows:
 - a) Project identification and boat launch information signs are in place at the entrance to the project.
 - b) A 4-ft by 8-ft "DAM AHEAD NO TRESPASSING" SIGN (orange lettering on white background) is mounted on the flood gate deck facing upstream.
 - c) A sign at the project entrance warns that entry is restricted to authorized persons only.
 - d) Warning signs measuring 4-ft by 4-ft and reading "DANAGER DAM AHEAD" are installed on either side of the river approximately 100 yards upstream of the boat barrier system.
 - e) Signs on either side of the river, at least 300 feet downstream from the dam and facing the water warn that water may rise rapidly without warning.
 - f) A sign at the downstream end of the tailrace canal warns swimmers and boaters of possible changes in current without warning in the power canal.
 - g) A sign at the Durham side access explains "HORN & STORBE ON POWERHOUSE WARN OF PROBABLE RISE OF WATER TO DANGEROUS CONDITION"

- h) "DANGER HIGH VOLTAGE" signs are posted on all sides of the electrical switch yard on the outlet deck of the powerhouse.
- i) Canoe portage signs are placed along the portage route.

Locations of the above public safety signs and devices are indicated on the attached site plan of the Worumbo Project.

- A horn and strobe light are provided to warn of an impending rise in water flow in the bypass area to possibly dangerous levels. The horn sounds automatically in the event of a unit trip. It can also be actuated manually in the event of a planned shutdown.
- Public boat launch facilities approximately two miles upstream and approximately one half mile downstream provide access to the project waters for rescue operations. Public safety signs have been erected at this facility to warn boaters of limited clearance under the downstream railroad bridge. These signs include a 2' x 2' sign visible to boaters at time of launch and two 4' x 4' signs mounted on either side of the railroad bridge and visible to boaters approaching from either direction. Copies of sketches indicating placement of signs on the railroad bridge and a depiction of the sign instated at the boat launch are attached.
- During the winter recreation season, a sign warning snowmobile operators of the danger of thin ice is suspended across the river in approximately the same location as the summer boat barrier system. The white sign with a combination of black and reflective orange lettering measures approximately 20 inches wide by 12 feet long. Installation of the winter warning sign normally coincides with the removal of the boat barrier system.
- Security fencing is located along Canal Street, along the river bank from the main gate to the end of the shore-side training wall. Additional handrail and fencing have been installed on the upper wing wall which runs adjacent to the intake.



APPENDIX I

DEVIATION TABLE

	Data filed with FEDC	Dessen of Deviation	FFDC V/slation			
Date of Deviation	Date filed with FERC	Reason of Deviation	FERC VIOLATION	FERC Non-violation	Letter to FERC	FERC's Determination letter
		the station was forced offline due to an unknown			https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		problem with the Central Maine			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
10/30/2012	11/28/2012	Power Company system		Х	<u>3119145</u>	leID=13201514
		a failure occurred on the governor blade control				
		module of Unit # 1, which was the only unit on-line				
	1	at that time. Consequently, it drove the unit blades			https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		to 0% and the wickets to 100%, and the power			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
11/27/2012	1/2/2013	output of Unit #1 was between 1.2 and 1.3 MW		x	3145491	leID=13209193
11/2//2012	1/2/2015			Λ	5145451	1010-13203133
	1	the station operator was informed that ISO New			https://olibrary.forc.gov/idmus	https://olibrany.forc.gov/idm
		Endered had dealered a system (asis as "				
10/10/2010		England had declared a system min gen			/common/opennat.asp?fileiD=1	ws/common/opennat.asp?fl
12/12/2012	1/24/2013	emergency and ordered the station offline.		X	3167607	IEID=13201514
	1				https://elibrary-	
	1				backup.ferc.gov/idmws/commo	https://elibrary.ferc.gov/idm
		during a high flow period, Unit #2 output was			n/opennat.asp?fileID=1316760	ws/common/opennat.asp?fi
12/24/2012	1/24/2013	lowered in order to properly clean its trash racks		Х	<u>7</u>	leID=13201514
	1				https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
	1	Tripped off line during heavy			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
2/9/2013	1/24/2014	snow storm		Х	<u>3493815</u>	leID=13538709
		the river ice cap broke free on the night of March 12				
	1	and accumulated in the project's forebay. In order			https://elibrary.ferc.goy/idmws	https://elibrary.ferc.gov/idm
		to clear the ice and associated debris the #1 flood			/common/opennat asp?fileID=1	ws/common/opennat asp?fi
3/13/2013	4/16/2013	gate was opened and station output was reduced		x	3267018	leID=13269190
5/15/2015	4/10/2015	gate was opened and station output was reduced		~ ~	5207010	1010-13203130
	1	The plant operator began lowering the beadpond				
		level to reset nine down flackboards papels. At 7:15				
		level to reset nine down hashboards pariets. At 7.15				
		am, the pond level dropped below the required			nttps://elibrary.ferc.gov/ldmws	https://elibrary.ferc.gov/idm
		seasonal flow of 200 cfs. You reported that the			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
6/25/2013	7/22/2013	lowest pond level reached was 97.38 feet MSL		X	<u>3311384</u>	leID=13351134
	1	The station tripped off-line as a result of an incident			https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		occurred at Central Maine Power Company system			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
8/9/2013	8/26/2013	due to a storm event		Х	<u>3337765</u>	leID=13351134
					https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
	l				/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
9/13/2013	1/24/2014	Unit No.1 tripped off line due to a lightning storm		х	<u>3493815</u>	leID=13538709
		Powerhouse was off line due to a			https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		fire at Central Maine Power'			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
9/21/2013	1/24/2014	Topsham Substation		х	3493815	leID=13538709

Date of Deviation	Date filed with FERC	Reason of Deviation	FERC Violation	FERC Non-Violation	Letter to FERC	FERC's Determination letter
					https://elibrary-	
		The station was forced off line by a problem at			backup.ferc.gov/idmws/commo	
		Central maine Power Company's Topsham			n/opennat.asp?fileID=1377184	
1/13/2014	1/31/2014	Substation			5	
					https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		The station was forced off line due to an unknown			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
2/14/2014	1/14/2015	CMP problem		х	3771845	leID=13867491
		The station output was reduced and #1 flood gate			https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		100% in order to clear the forbay area of floating ice			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
4/7/2014	1/14/2015	and trash		х	3771845	leID=13867491
,,,	, ,				https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		The station was tripped offline due to a high voltage			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
7/15/2014	1/14/2015	breaker failure at the CMP substation at Lewiston		x	3771845	leID=13867491
771372011	1/1/2013			~	https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
					/common/opennat asp?fileID=1	ws/common/opennat asn?fi
9/6/2014	0/11/2014	lightning storm caused the station to trip offling		v	2622524	
8/0/2014	3/11/2014	email message to the Maine DIEW requesting		^	5055554	1010-13720232
		authorization to tomporarily modify the required			https://alibrary.forc.gov/idmus	https://alibrary.forc.gov/idm
		autionization to temporarily modify the required			/common/openpat.acp2fileID=1	inteps.//endrary.ierc.gov/idin
0/20/2014	0/47/2014	bypass minimum now in order to safely remove the		N.	2ca7020	ws/common/opennat.asprin
8/28/2014	9/1//2014			X	3637830	IEID=13720252
		The station was tripped offline to an unknown event			https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
- / /		at CMP Lisbon Falls substation, unit #1 offline during			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
9/11/2014	1/14/2015	this event.		X	<u>3771845</u>	leID=13867491
		While trying to lower the pond following an earlier				
		station trip during a CMP system event and during a			https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		low flow period, bypass flows fell below the			<pre>/common/opennat.asp?fileID=1</pre>	ws/common/opennat.asp?fi
9/11/2014	1/14/2015	seasonsal minimum of 200 cfs.		Х	<u>3771845</u>	leID=13867491
					https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		The station was tripped offline to an unknown CMP			<pre>/common/opennat.asp?fileID=1</pre>	ws/common/opennat.asp?fi
10/30/2014	1/14/2015	line event, unit #1 was offline during this event		Х	<u>3771845</u>	leID=13867491
					https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		The station was tripped offline to an unknown CMP			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
11/24/2014	1/14/2015	line event.		Х	<u>3771845</u>	leID=13867491
		Both units at the project tripped offline due to an			https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		internal power supply issue for the programmable			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
11/18/2017	12/14/2017	logic controller control relays		Х	4777026	leID=14795863
		Unit 2 tripped offline again due to the same power			https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		supply issue and the flow interruption lasted for			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
11/18/2017	12/14/2017	approximately 0.55 hour		х	4777026	leID=14795863
	· ·					
		Unit 2 tripped offline a third time due to the same			https://elibrary.ferc.gov/idmws	https://elibrary.ferc.gov/idm
		power supply issue and the flow interruption lasted			/common/opennat.asp?fileID=1	ws/common/opennat.asp?fi
11/18/2017	12/14/2017	for approximately 1.5 hours		x	4777026	leID=14795863

Date of Deviation	Date filed with FERC	Reason of Deviation	FERC Violation	FERC Non-Violation	Letter to FERC	FERC's Determination letter
		Braintree Electric Light Department (BELD) dispatch				
		informed Worumbo Project personnel that ISO-NE				
		had issued a Do Not Exceed (DNE)				
		generation order of 11,000 kW for the Worumbo				
		Project. In response to this request, at				
		12:15pm, the station generation output was			https://elibrary-	https://elibrary-
		lowered from 14,500 kW to 11,000 kW. River			backup.ferc.gov/idmws/commo	backup.ferc.gov/idmws/com
		inflows to the project were estimated to be 7,200			n/opennat.asp?fileID=1482874	mon/opennat.asp?fileID=14
1/24/2018	2/23/2018	cfs during this event.			2	894149

* A FERC letter has been yet been received for the January 24, 2018 event

APPENDIX J

COPY OF FINAL SPP

ATTACHMENT A SPECIES PROTECTION PLAN for 2017 to 2025 WORUMBO PROJECT (FERC No. 3428-ME)

July 2016

ATTACHMENT A

SPECIES PROTECTION PLAN for 2017 to 2025

WORUMBO PROJECT

July 2016

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List of Acronyms

BA	.Biological Assessment
BO	.Biological Opinion
BBII	.Brown Bear II Hydro, Inc.
DPS	.Distinct Population Segment
ESA	.Endangered Species Act
FERC	.Federal Energy Regulatory Commission
GOM	.Gulf of Maine
ITS	.Incidental Take Statement
MDMR	.Maine Department of Marine Resources
NMFS	.National Marine Fisheries Service
NOAA	.National Oceanic and Atmospheric Administration
Services	.USFWS and NOAA / NMFS
SHRU	.salmon habitat recovery unit
SPP	Species Protection Plan
USFWS	U.S. Fish and Wildlife Service
Worumbo Project or Project	.Worumbo Hydroelectric Project

1.0 Background and Purpose of Protection Measures

Brown Bear II Hydro, Inc. (BBII) owns and operates the Worumbo Hydroelectric Project (Worumbo Project or Project) on the Androscoggin River pursuant to the license issued by the Federal Energy Regulatory Commission (FERC) on October 15, 1986 (FERC No. 3428). *See* 37 FERC ¶62,045.

The 2000 listing of the Gulf of Maine (GOM) Distinct Population Segment (DPS) of Atlantic salmon as endangered under the Endangered Species Act (ESA) was expanded to include the Androscoggin River in 2009 (USFWS and NMFS 2009). The geographic boundaries of the freshwater range of GOM salmon on the Androscoggin River include the Worumbo Project area. The Worumbo Project also falls within the designated critical habitat of the Merrymeeting Bay salmon habitat recovery unit (SHRU) for Atlantic salmon (NMFS 2009).

As a result of the expanded listing, the Licensee consulted with the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) (collectively, Services) to determine if the Project may have an effect on the endangered species.¹ Since specific information on potential effects the Project may have on Atlantic salmon was lacking, the Licensee developed an interim Species Protection Plan (SPP) that would identify enhancements necessary to avoid and minimize impacts related to the operation of the Worumbo Project on Atlantic salmon. The interim SPP also required studies, including Atlantic salmon passage studies, to collect additional information on potential Project effects on Atlantic salmon, to help inform development of effective measures to protect Atlantic salmon at the Project. The interim SPP covered the five-year period of 2012 to 2016, with up to three years of monitoring (2013-2015) to evaluate upstream and downstream passage, and 2016 for development and completion of this subsequent SPP. A draft Biological Assessment (BA) was also developed along with the interim SPP to evaluate Project effects on endangered Atlantic salmon and the proposed action of incorporating the interim SPP into the

¹ By letter dated July 14, 2010, the Licensee was designated as FERC's non-federal representative for the purposes of conducting informal Section 7 consultation with NMFS.

Project's license issued by FERC. The draft BA and interim SPP were submitted to FERC on May 14, 2012.

FERC adopted the BA and interim SPP and on June 7, 2012, sent a letter to NMFS requesting the initiation of formal Section 7 ESA consultation. On October 18, 2012, NMFS issued a Biological Opinion (BO) which determined that the Project may adversely affect a small number of individual Atlantic salmon but was not likely to jeopardize the continued existence of the Atlantic salmon population or destroy/adversely modify designated critical habitat. The Incidental Take Statement (ITS) of the BO included a Reasonable and Prudent Measure and implementing Terms and Conditions, including a requirement for the Project to be operated consistent with protection measures outlined in the interim SPP. By order dated May 31, 2013 (*see* 143 FERC ¶62,162), FERC approved the interim SPP and amended the Worumbo Project license to include the BO's Terms and Conditions for implementing the Reasonable and Prudent Measure, which by reference included the measures set forth in the interim SPP.

By letter dated March 24, 2016, BBII was designated by FERC as its non-federal representative for purposes of conducting informal Section 7 ESA consultation in the development of a subsequent SPP and a draft BA in support thereof. Based on the results of the studies and information collected during the interim SPP and in consultation with the Services, BBII has developed this subsequent SPP to identify measures and enhancements to avoid and minimize impacts related to the operation of the Worumbo Project on Atlantic salmon. This SPP will cover the period from 2017 to the issuance of a new license for the Project (current license expires in 2025). The SPP will be submitted to FERC for incorporation into the Project license. At that time, Section 7 consultation will be re-initiated with NMFS by FERC. BBII will continue consultations with NMFS and other resource agencies regarding the protection of Atlantic salmon during these licensing activities.

2.0 Current Protection Measures

BBII currently employs several protection measures at the Worumbo Project to avoid and minimize effects the Project may have on Atlantic salmon and critical habitat. Several of these measures were made proactively in anticipation of the need to further protect Atlantic salmon at the Project following the 2009 expanded ESA listing, as well as measures specified in the

Reasonable and Prudent Measure and Terms and Conditions of the ITS of the 2012 NMFSissued BO. The following list outlines the current protection measures employed at the Worumbo Project:

- Operation of a modified pneumatic flashboard spillway system allowing continuous flow in the bypass reach that offers a continuous downstream passage route for Atlantic salmon.
- Refurbishment of all gate hoists in 2015.
- Operation of the current upstream and downstream fish passage facilities in coordination with downstream projects and the Maine Department of Marine Resources (MDMR), to provide adequate passage of Atlantic salmon and other anadromous species.
- Operation of the Project in a run-of-river mode while providing seasonally variable bypass and instream flows suitable for the protection of salmon habitat.
- Conduct fishway maintenance activities that include debris management to ensure downstream bypass weir operates to enhance salmon passage.
- Monitor apparent bird predation during downstream salmon passage studies.
- Fishway pumps are routinely inspected and repaired on an as-needed basis.
- BBII has complied with the Reasonable and Prudent Measure and Terms and Conditions found in the ITS of the NMFS 2012 BO (which by reference include the interim SPP measures) by completing annual monitoring and reporting to confirm that BBII is minimizing incidental take of Atlantic salmon and reporting all Project-related observations of dead or injured salmon to NMFS. These requirements include the following:
 - Notify NMFS of any changes in operation including maintenance activities and debris management at the Project during the term of the interim SPP. Also, allow NMFS to inspect fishways at the Project at least annually.
 - Contact NMFS within 24 hours of any interactions with Atlantic salmon, including non-lethal and lethal takes.

- In the event of any lethal takes, any dead specimens or body parts must be photographed, measured, and preserved (refrigerate or freeze) until disposal procedures are discussed with NMFS.²
- A plan to study the passage and survival of migrating adults, smolts, and kelts at the Worumbo Project was prepared in consultation with NMFS, approved by FERC, and implemented by BBII.
- Conducted three years of Atlantic salmon passage studies. These were completed in 2013, 2014, and 2015 and reported in the annual interim SPP reports after review and comment by NMFS.
- Submitted annual and summary reports describing the previous years' activities under the interim SPP.

3.0 Proposed Protection Measures

As described in Section 2 above, the Worumbo Project already includes numerous Atlantic salmon protection and enhancement measures, such as providing upstream and downstream passage, predominantly run-of-river operations (with exceptions for power system emergencies and maintenance needs), maintaining instream flows, and implementing debris management measures (summarized in the draft BA). In this section BBII outlines additional measures to further protect and enhance Atlantic salmon and its habitat within the Androscoggin River. These protection measures were developed by BBII in consultation with the resource agencies, and were considered to be the most appropriate measure to protect and enhance Atlantic salmon in the Androscoggin River.

3.1 Atlantic Salmon Habitat Mapping in the Little River

The removal of a small water control dam in the Little River in 2009 opened miles of historic spawning and rearing habitat to Atlantic salmon in the Little River, which flows into the Androscoggin River downstream of the Worumbo Project. While the Little River is actually

² During the 2014 downstream smolt passage study, 10 tag life/retention control fish died as a result of a pump failure in the holding tank. This incident was reported to NMFS as per protocol.

outside of the Worumbo Project area, being located downstream of the Project, in support of the interim SPP, a preliminary habitat and barrier survey was conducted under low flow conditions on the accessible lower 6.5 miles of the main stem of the Little River on June 30 and July 1, 2011, to evaluate the suitability of habitat for Atlantic salmon migrating, spawning, and rearing activities, as well as to identify potential barriers to salmon passage. The survey report was included in the draft BA that the Licensee submitted to FERC on May 14, 2012.

With respect to salmon passage, the preliminary data collected during the survey indicates that most of the lower reach of the Little River is accessible to Atlantic salmon. Debris and beaver dams were abundant throughout the upper reach of the Little River, most of which appeared to be passable, though several of the larger ones may cause delays or inhibit passage under low flow conditions. The two culverts identified were typically at stream grade and appeared to be passable by salmon; however, the culverts appeared undersized and scour holes were present downstream. Notwithstanding the barriers found throughout the study reach, a substantial portion of the Little River would be accessible to salmon. Passage effectiveness would be dependent on river flows and the dynamic nature of the debris movements.

Within the portion of the Little River that was surveyed, suitable habitat for spawning appears to be limited. Atlantic salmon require spawning sites with clean, permeable gravel and cobble substrate, oxygenated water, and cool water temperatures. The most suitable habitat in this reach was located adjacent to a wastewater treatment facility just upstream of the cascades section in the lower reach of the river. This area consisted of a riffle and run habitat complex with large boulders, rocky outcrops, and mixed gravel. Although spawning habitat appeared to be limited in the surveyed section of the Little River, more suitable habitat may occur upstream of the survey area or in a major tributary such as the Little Gillespie Brook. A number of smaller tributaries were noted within the surveyed reach of the Little River that may provide rearing habitat for juvenile salmon. Under the summer low flow conditions present during the survey, these small tributaries did not contain enough flow for adult migration.

A substantial portion of the Little River consists of deep, pool habitat with substantial amounts of cover, which offer protection from extreme temperatures, refuge from predators, increased food abundance, and resting areas during migrations. Additionally, the water quality of the Little

River appeared to be suitable for salmon. Water temperatures did not exceed 21°C and pool habitat would likely provide some refuge for fish during warmer weather. Dissolved oxygen levels also appeared to be suitable and were above 6.0 milligrams per liter except for a single reading obtained in a riffle with prolific algal growth.

This 2011 habitat and barrier survey was conducted during low flow conditions. The quality and availability of suitable Atlantic salmon migration habitat would likely improve during higher flow conditions, especially during the spring when many salmon migrate upstream and again in fall when salmon migrate to suitable habitat to spawn. Regardless, these data suggest a portion of the Little River is accessible and habitable by Atlantic salmon. As noted, additional suitable rearing habitat likely also exists upstream of the 2011 survey area as well as in the many small tributaries to the Little River that were not included in this survey. In 2012, the Maine Department of Marine Resources (MDMR) conducted a stream crossing barrier survey in the Little River watershed that identified 11 barriers and 13 potential barriers in this watershed (Figure 1). In contrast to the 2011 survey conducted by the Licensee, the MDMR survey evaluated stream crossings only and did not evaluate salmon habitat in watershed or barriers not at stream crossings. In 2014, four 2SW adult Atlantic salmon were captured at the downstream Brunswick fishway trap and tagged with radio transmitters by MDMR staff. Based on monitoring of the radio tags, one of these adult salmon was tracked into the Little River just below the Worumbo Hydro Project during the spawning season where it was visually observed spawning with another salmon (untagged). It is believed that the other salmon may have been a non-tagged salmon that passed through the Brunswick fishway while being cleaned (USASAC 2015). This confirms that suitable salmon spawning habitat is present in the Little River.

As noted in the 2016 Atlantic Salmon Recovery Workplan (USFWS and NOAA-Fisheries 2016), the Little River currently provides the best opportunities for Atlantic salmon spawning and rearing in the lower Androscoggin River due to access limits resulting from dams on major tributaries such as the Little Androscoggin River and the Sabattus River. Based on specific discussions on the need for more in-depth understanding of the Little River Atlantic salmon habitat that is necessary to facilitate management decisions, BBII plans to conduct a more detailed Atlantic salmon habitat and potential barrier survey in the Little River and its major tributaries following applicable MDMR and USFWS protocols. The survey will also collect thermal profiles based on Craig Brook National Fish Hatchery protocols as recommended by



Figure 1 - Little River Public Stream Crossings

MDMR. The survey data would be suitable for inclusion in the salmon habitat GIS database, which currently does not include field-mapped data within the Androscoggin River watershed. In addition to the Little River mainstem, the survey will cover several major tributaries that may also provide valuable salmon spawning and rearing habitat, such as Little Gillespie Brook and Fisher Stream. This survey will also provide additional and updated information on potential barrier removals, culvert replacements, suspected areas of point and non-point pollution, and information on thermal characteristics important to assessing the quality of salmon habitat in the Little River Basin.

The proposed habitat mapping is consistent with the Merrymeeting Bay SHRU Recovery Actions outlined in the 2016 Workplan (USFWS and NOAA-Fisheries 2016). BBII will coordinate this collaborative effort with MDMR and anticipate a MDMR staff member will assist BBII contractors in conducting the survey to ensure habitat assessments are consistent with MDMR protocols. Further, the MDMR is listed as one of the implementing agencies for this recovery action (Activity Number M11 in USFWS and NOAA-Fisheries 2016). Data would be valuable for identifying areas of quality salmon spawning and rearing habitat that need protection, estimating salmon production potential in the river, and for selecting and prioritizing habitat improvement opportunities in the Little River. BBII will discuss the results of the survey with NMFS and MDMR to identify potential Atlantic salmon habitat enhancement projects and potential cooperative efforts to address them. It is expected that the survey will be done in cooperation with the licensees of the two downstream hydroelectric projects, Pejepscot and Brunswick, which are also involved in ESA consultation.

3.2 Modified Fishway and Project Operations

The fishway and floodgate operation measures proposed below are intended to further enhance upstream and downstream passage at the Project in an adaptive manner. The proposed protocols will also assist BBII in making operational decisions consistently each year, with confirmation from MDMR and NMFS.

3.2.1 Upstream Fishway Operations

BBII will operate the Worumbo upstream fishway from May 1 to November 15 each year, river conditions permitting, or if an alternate date is approved through consultation with agencies.

The fishway typically requires a maintenance check and temporary shutdown during the fishway season. BBII will schedule this activity to occur between the end of July and mid-August, while maintaining needed flexibility to respond to emergency repairs that may occur outside this scheduled window. Any shutdown of upstream fishway operation will be limited to the time needed to make the necessary repairs. The fishway will restart operations as soon as the repairs have been completed. BBII will coordinate with MDMR and confirm with NMFS that any modified fishway operational dates are approved.

3.2.2 Downstream Fishway Operations

BBII will operate the Worumbo downstream fishway from April 1 to December 31 each year, river conditions permitting. This will ensure that the Worumbo Project fishway is open when anadromous species may be present near the Project. BBII will coordinate with NMFS and MDMR prior to modifying the fishway operational dates.

3.2.3 Floodgate Operations

The 2013-2015 downstream smolt passage studies provided valuable site-specific information to evaluate whole station survival and assist in developing additional measures to increase downstream passage survival. Smolt survival past the Project was a three year average of 86.7 percent based on the three years of studies. In 2014 and 2015, various floodgate settings were tested to evaluate if this scenario increases downstream bypass effectiveness by offering another downstream passage route so less smolts pass through the powerhouse. These studies showed that smolts did pass through the floodgate and at a higher rate when the floodgate was at its lowest flow discharge setting tested (i.e., 500 cfs). The average whole station survival for the two years when the floodgate openings were tested was 94.6 percent. While the floodgate was tested using multiple openings or releases and passage rates varied, as noted, the general trend was for a higher rate of smolt passage at the lower releases. Therefore, BBII proposes to provide an additional downstream passage route through the floodgate for a two week period at night,

specifically between May 7 and May 21st each year, which represents the expected peak and majority of the downstream smolt migration season based on research data for the Penobscot River. This represents a significant increase in an alternative bypass flow release. However, this measure will only be implemented if it is known that at least two adult Atlantic salmon were passed upstream two years prior (and thus may have successfully spawned and produced out-migrating smolts), or if an Atlantic salmon stocking program is established upstream of the Project.

3.3 Downstream Atlantic Salmon Passage Performance Standard

Consistent with the intent of the interim SPP, and based on the results of the three years of smolt survival studies monitoring passage from 200 meters upstream of the dam, the Project and fish passage facilities will be operated to meet a minimum performance standard for downstream migrating Atlantic salmon of 87 percent survival, evaluated by being within the lower and upper 95 percent confidence limit. In the event future monitoring discussed herein reveals that the performance standard is not being met, in consultation with NOAA and the other resource agencies, BBII will evaluate additional measures designed to direct migrating salmon to the most effective passage routes, and will then monitor passage survival again the year following implementation of such additional measures to confirm the performance standard is being met. As discussed in Section 8 of the draft BA, the Androscoggin River has zero functional habitat units and is not required to meet the SHRU recovery goals. However, by establishing a Project-specific performance standard of 87 percent that is consistent with the actual recent study results, in addition to the other protection measures detailed in this SPP, continued operation of the Project will allow for any salmon originating upstream of the Project to contribute to the Merrymeeting Bay SHRU population and the overall GOM DPS.

Establishing a performance standard is consistent with the Merrymeeting Bay SHRU Recovery Actions outlined in the 2016 Workplan (USFWS and NOAA-Fisheries 2016). The monitoring studies conducted from 2013 to 2015 demonstrated compliance with this standard. Additional monitoring will be conducted ten years (2025) from the most recent monitoring effort. This monitoring frequency is consistent with the monitoring frequency described in the long-term SPP

accepted by NMFS for the lower Penobscot hydropower projects once a performance standard has been met.

3.4 Adult Salmon Passage Studies

BBII will continue the current practice to monitor adult upstream migrating Atlantic salmon using the fish lift throughout the entire fishway operation season. A challenge of conducting an upstream fish passage efficiency study at the Project is that there are no Atlantic salmon originating from upstream of the Project and strays (e.g., fish that originated from downstream or from another watershed such as the Kennebec River would be less motivated to move upstream at Worumbo Dam; thus, a study of fish passage efficiency that included fish not originating from upstream of Worumbo would not provide an accurate assessment of the effectiveness of the fishway. BBII has been cooperating with MDMR's management and research efforts related to Atlantic salmon on the Androscoggin River and plans to continue this relationship in the future. The MDMR collects biological information (including genetic samples and origin) on each Atlantic salmon using the Brunswick Project fishway. Based on documented returns monitored at the Brunswick fishway, there are too few adult Atlantic salmon migrating into the Androscoggin River to conduct a scientifically rigorous and defensible fish passage effectiveness study. Further, these salmon do not originate from upstream of the Worumbo Dam and thus would not have the homing drive to migrate upstream of the Project which is needed to evaluate passage effectiveness. Resource agencies agreed with this assessment on another hydropower project in the Penobscot River. However, the use of PIT and/or radio tagging at Brunswick and tracking equipment at the Worumbo Project can provide valuable information on the number and timing of upstream migration by individual Atlantic salmon in the Project area

In consultation with the resource agencies, BBII proposes to implement an adaptive management approach if adult Atlantic salmon begin to return to the Androscoggin River in substantially larger numbers within the term of this SPP. Based on the existing information on the proportion of adult returns counted at Brunswick that also reach Worumbo Dam (Table 4 in the BA), at least two consecutive years of 40 adult Atlantic salmon of naturally reared origin collected at the Brunswick Project and released upstream are needed to obtain any useful, statistically significant data. When this occurs, BBII proposes to consult with the agencies to develop a detailed study

plan to conduct upstream and downstream adult Atlantic salmon passage monitoring studies the following year. This will allow time to secure the appropriate tags and monitoring equipment and have everything in place for the next season. The study is expected to use PIT and/or radio tagging and tracking methodology, which is consistent with the current Atlantic salmon passage study plan developed with the interim SPP and incorporated by reference into the Terms and Conditions of the BO's ITS. Installation of tracking equipment at the Project fish lift entrance and exit will track salmon successfully using the fishway to migrate upstream. The specific monitoring methodology and locations will be determined during development of the detailed study plan. Tagging will be done concurrent with current collection activities at the Brunswick Project fishway so as not to increase handling stress. BBII will provide the tags and tagging equipment to the MDMR or the Brunswick Project licensee or contractor for the study for tagging of the salmon. Monitoring equipment can be added at Worumbo to monitor the downstream passage of kelts through late fall, if desired by the agencies.

3.5 Annual Reporting

Currently, by Order Approving Recommendations on Fish Passage Studies (FERC order dated November 12, 1998), the Licensee must conduct annual meetings and submit fishway status reports to FERC. These annual reports describe dates of fishway operations as directed by MDMR and fishway maintenance activities for the Project. Through filing of this SPP with FERC, BBII plans to request approval to replace the annual fishway status meetings and reporting with the broader annual reporting under the SPP. The comprehensive annual SPP reports will more effectively report on all fish passage and other protection measures and activities rather than having separate and somewhat redundant reports that are currently required. The annual SPP reports will be submitted to FERC and provided to NMFS, USFWS, and MDMR by the end of March each year.

4.0 Implementation Provisions

4.1 Effective Date and Schedule

Agreed-upon monitoring and potential additional protection measures will be implemented following the issuance of the BO and ITS, if appropriate, expected by the end of 2016 when the

current ITS expires, and continue until issuance of the new license for the Project (current license expires 12/1/2025).

4.2 Requirements and Funding

BBII shall provide funding for the agreed-to measures.

4.3 Monitoring and Reporting

BBII will prepare annual reports to review the previous year's activities associated with the listed protection measures with resource agencies and assess the need to continue or modify activities under the adaptive management strategy, including the status of adult upstream and downstream passage studies by November 1. This annual report will be submitted to resource agencies for review and comment prior to filing with FERC by March 31 each year. The annual reports will also incorporate the information currently required by the annual fishway status reports and annual meetings. Thus, BBII anticipates that a separate fishway status report (FERC order dated November 12, 1998) will no longer be required.

4.4 Adaptive Management

The agreed-upon activities associated with the listed protection measures for Atlantic salmon will be implemented within an adaptive management framework with integration of management and research in order to provide feedback and the ability to adapt these measures, as necessary.

5.0 Literature Cited

- National Marine Fisheries Service (NMFS). 2009. Endangered and Threatened Species.
 Designation of critical habitat for Atlantic salmon (*Salmo salar*) Gulf of Maine Distinct
 Population Segment. Final rule. Federal Register, Vol. 74, No. 117. June 19, 2009.
- U.S. Atlantic Salmon Assessment Committee (USASAC). 2015. Annual Report of the U.S. Atlantic Salmon Assessment Committee. Report No. 27 - 2014 Activities. Kittery, ME. February 9-12, 2015. 282 pp.

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 Endangered and Threatened Species. Determination of Endangered Status for the Gulf of Maine Distinct Population Segment of Atlantic salmon. Final rule. Federal Register, Vol. 74, No. 117. June 19, 2009.
- U.S. Fish and Wildlife Service (USFWS) and NOAA-Fisheries. 2016. SHRU Recovery Workplan-2016. Online URL: http://atlanticsalmonrestoration.org/resources/documents/ atlantic-salmon-recovery-plan-2015/recovery-plan-pages/shru-based-recovery/shrurecovery-workplan-2015/view. Accessed April 6, 2016.
APPENDIX K

WORUMBO FLOW RELEASE PLAN 1999

Worumbo Project (FERC Project No. 3428-ME

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Water Level / Flow Release Plan

Miller Hydro Group

October 1999

Miller Hydro Group WORUMBO PROJECT

Water Level/Flow Release Plan

History

In its Maine Waterway Development and Conservation Act and Water Quality Certification order (#L-010930-35-A-N) for the Worumbo Project issued on June 12, 1985, the Maine Board of Environmental Protection addressed issues of water level and flow releases in Conditions 1 through 3. Condition #1 established 97 feet (spillway crest) as the normal pond elevation. Condition #2 required that, "Except as irreconcilably limited by order of state, local or federal authorities, ... an instantaneous minimum flow of 1,685 cfs, or a flow equal to inflow when such inflow is less than 1,685 cfs, shall be maintained from the project at all times". Condition #3 required an interim minimum bypass flow of 25 cfs and an instream flow study.

The Federal Energy Regulatory Commission (FERC) issued its "Order Issuing License (Major)" for the Worumbo Project (FERC Project No. 3428-ME) on December 24, 1985. Articles 30, 31, and 32 of the license addressed issues of flow releases and water level.

<u>Article 30</u> required the licensee to operate the Worumbo Project in an instantaneous run-of-river mode, maintaining discharges so that flow "as measured immediately downstream from the project tailrace, approximates the instantaneous sum of inflow to the project reservoir." Instantaneous run-of-river operation could be temporarily modified "if required by operating emergencies beyond the control of Licensee, and for short periods upon mutual agreement between Licensee and the Maine Department of Inland Fisheries and Wildlife." Although the licensee, in its application, had proposed to operate the project in a run-of-river mode and to provide a minimum flow of 1,685 cfs, or inflow to the reservoir, whichever is less, as recommended by the resource agencies, FERC staff stated that, "By operating the project in a run-of-river mode, inflow to the project impoundment, less any process water, is instantaneously passed downstream, thereby eliminating the need to establish a minimum flow below the project."

Article 31 established an interim minimum flow of 25 cfs to the bypass reach.

<u>Article 32</u> required the development of an instream flow study plan to "assess the relationship of various minimum flow releases ... to fish habitat in the reach of the Androscoggin River between the Worumbo Dam and Powerhouse" and required the licensee to conduct an instream flow study in accordance with the approved plan. The instream flow study was conducted in consultation with the resource agencies and the resulting proposed minimum flow release plan was submitted to the FERC.

In its Condition Compliance & Amendment order of March 20, 1992, the Maine Department of Environmental Protection approved a seasonal schedule of minimum bypass flows (see below) which were developed in consultation with the resource agencies in conjunction with the

instream flow study required under Condition #3B of the Maine Waterway Development and Conservation Act Permit and Water Quality Certification.

In its "Order Approving and Modifying Minimum Flow Release Plan and Amending License" issued January 26, 1994, the Federal Energy Regulatory Commission (FERC) amended Article 31 of the license for the Worumbo Project (FERC Project No. 3428-ME) to read as follows:

Article 31. For the protection and enhancement of fisheries resources, the licensee shall discharge from the Worumbo Dam Release minimum flows, as measured immediately downstream from the dam, according to the following schedule.

September 1 – October 31 November 1 – November 30	200 cfs 50 cfs 1 f	mless the downstream ishway is operational, in which case 85 cis
December I – April 15	50 cfs	
April 16 – May 31	300 cfs	
June 1 – June 30	200 cfs	
July 1 – August 31	100 cfs	

These minimum flows may be temporarily modified if required by operating emergencies or by order of any jurisdictional government agency, or as authorized in advance by DIFW. Further, the licensee may undershoot the stated minimum flow up to 50 percent for a period not to exceed one hour, provided that only one such underrelease may be made in a 24-hour period without authorization from the DIFW.

A minimum flow gauging plan was subsequently filed with the FERC on June 6, 1994, and is described as follows:

A wooden flashboard system, measuring 0.5 feet high, will be installed across the concrete capped portion of the ungated spillway (dam) for diverting flow over the dam's westerly timber crib section, and into the bypass reach. This timber crib section of the dam will become the weir (approximately 325 feet wide) used in the weir formula for calculating flow into the bypass. Calculations will be made determining the flow through the weir based on 0.05 foot increments for headpond elevations ranging from 97 feet (crest of dam) to 97.5 feet. According to the licensee's rating curve for spillway flow, the headpond should be maintained at elevation 97.14 feet for a 50 cfs release, 97.23 feet for a 100 cfs release, 97.36 feet for a 200 cfs release, and 97.46 for a 300 cfs release. The plant operator will use the calculations and the plant's pond level controller to adjust the elevation of the headpond and the flow over the weir. The pond level controller receives its signal from a pressure cell located in a stilling well at the headpond. ... The total seasonal flow into the bypass will be the sum of the calculated flow, any flow through

> the downstream fishway, plus estimated leakage through the weir when applicable. ... The flashboards will be designed to fail at elevation 102 feet. In the event the boards fail, the pond elevation will be adjusted using calculated flows for the entire ungated spillway.

The plans for spillway modification (flashboards) and the Rating Curve for Spillway Flow, used to determine and monitor bypass flows, were submitted to the DEP on July 21, 1994.

By order issued June 9, 1995, the FERC approved the gauging plan. Since that time, project operators have maintained the required seasonal flows by controlling pond level in accordance with this plan. The actual set point was maintained above the normal band of fluctuation to minimize opportunity for deficiencies in required bypass flows. Directing these flows to the west side crib dam has served to maximize aeration and also to provide maximum wetting of the bypass habitat. The project has been operated strictly as a run-of-river facility except during pond drawdowns in response to power system emergencies.

Amended License

In 1998 the licensee applied for an Amendment of License to replace the existing flashboards and to modify operation of the Worumbo Project. The nominal headpond elevation¹ would be increased from 97.0 feet to 98.5 feet. The licensee would be permitted to fluctuate the headpond elevation between 98.5 feet and 97.0 feet. The existing seasonal schedule of minimum bypass flows would be maintained. However, due to the permitted drawdown activity, the instantaneous run-of-river requirement would be modified to include a minimum flow requirement of 1,700 cfs, or inflow to the headpond, whichever was less, during headpond refill periods. The timber crib dam would be reinforced and a system of inflatable crest control devices would be installed. The conventional wood flashboards would be replaced with hinged steel panels supported by sacrificial wood struts.

On July 13, 1998, the Department of Environmental Protection issued its Maine Water Development and Conservation Act and Water Quality Certification Permit Modification approval of the proposed amendment. Condition #3C of the DEP permit requires the submittal of plans for monitoring and providing the impoundment water levels for approval. Likewise, Condition #4C requires a plan for monitoring and providing required minimum flows.

The Federal Energy Regulatory Commission issued its Order Amending License on August 13, 1998. Paragraph C of the order amends License Article 30 to read as follows:

<u>Article 30</u>. The licensee, except during periods of peaking, shall maintain the project reservoir at a normal maximum operating level of 98.5 feet mean sea level (msl).

¹ Nominal elevation refers to the elevation of the physical crest. Actual pond level equals nominal elevation plus that required to provide for seasonal minimal bypass flows.

> The licensee may periodically cycle generation, fluctuating the reservoir surface elevation between 98.5 feet and 97 feet msl. When refilling the reservoir after a peaking event, the licensee shall discharge a total flow from the project of at least 1,700 cfs or inflow, whichever is less. This discharge shall include the required minimum flow to the bypass reach and any flows through the project's fish passage facilities.

> Normal operation may be temporarily modified, if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement between the licensee and the Maine Department of Inland Fisheries and Wildlife.

Project Operation Under Amended License

1. Normal Pond / Run-of-River

This is the condition that most nearly resembles the historic operation. West side pneumatic crest gates are set at a nominal crest elevation of 99.0 feet msl. East side pneumatic crest gates are set at a nominal crest elevation of 99.0 feet msl. This diverts flows over the dam's westerly timber crib section as in the past. The headpond level control system is set to maintain a pond elevation sufficient to provide required seasonal minimum bypass flows. The attached table shows calculated flows² over the west side panels at various heights and configurations. The appropriate set point for entry into the station programmable logic controller (PLC) for headpond level control can be obtained from this table. As a practical matter, in order to avoid deficiencies caused by fluctuation during the leveling out process of the controller, the actual set point chosen is above the indicated height. Currently, the controller establishes an elevation.05 ft. above the indicated height. For example, with a minimum bypass flow requirement of 200 cfs, the set point that would be chosen from the attached chart would be 98.70' (98.65' plus .05'). Under such conditions, this would provide 248. cfs to the bypass reach. Future improvements in hardware or software may permit the licensee to reduce this margin without increased risk of violating the requirement.

2. Normal Pond / Flood Conditions

During flood conditions the pneumatic crest gates are intentionally lowered to provide discharge capacity and to relieve the pressure on the hinged steel boards. The west side crest gates are set to automatically lower when pond elevation reaches approximately 2.0 ft. above the set point. After the west side gates are lowered the east side crest gates will lower when the pond elevation once again exceeds the set point by approximately 2.0 ft. In actual practice these elevations may be modified (decreased) by the station operators to react to

² If the angle of the crest control panels is 16.2 degrees or greater, the Bureau of Reclamation's "Water Measurement Manual" sloping leaf gate weir formula is used (Q=Ca Ce Le He^{1.5} where Q=water flow in cfs, Ca=correction factor for the angle of the gate, Ce=effective discharge coefficient for a vertical weir, Le=effective crest length, and He=effective measurement head).

If the angle is less than 16.2 degrees, the broad crested weir formula is used (Q=Ce L $H^{1.5}$ where Q=water flow in cfs, Ce=coefficient, L=weir length, and H=measured head).

river conditions, especially the presence of ice flow. The mechanical panels are designed to fail at approximate elevation 101.0. Station operators are still experimenting with the sacrificial strut design in order to achieve the correct failure point.

3. Operation During Drawdown/Refill

Under drawdown conditions, just as in the case of normal pond operating conditions, operators provide required seasonal bypass flows over the west side crest gates. The station controller maintains the appropriate pond level set point to provide the required bypass flow. As the pond is drawn down the gates are progressively lowered in order to maintain a constant bypass flow.

During headpond refill periods, the station is operated in such a manner as to provide a total discharge of at least 1,700 cfs from the project. This minimum flow is calculated as the sum of bypass flow plus turbine discharge plus downstream fish passage flow (if operational) plus estimated dam leakage. Turbine flow is calculated by a conversion from kW to cfs as a function of net head. Therefore, during refill, the station generators are operated to provide the required discharge. Generator loading may be altered to control the rate of refill and to react to changes in river conditions.