LOW-IMPACT HYDROPOWER POWER INSTITUTE CERTIFICATION APPLICATION

HOOSIC RIVER HYDROELECTRIC PROJECT (FERC NO. 2616)



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LOW-IMPACT HYDROPOWER POWER INSTITUTE CERTIFICATION APPLICATION

HOOSIC RIVER HYDROELECTRIC PROJECT (FERC NO. 2616)

1.0 FACILITY DESCRIPTION

The Hoosic River Hydroelectric Project, Federal Energy Regulatory Commission (FERC) No. 2616 (Project), is owned and operated by Brookfield Renewable Energy Group. The Hoosic Project consists of two developments on the Hoosic River east of its confluence with the Hudson River, the Johnsonville Development at River Mile (RM) 13.3 and the Schaghticoke Development at RM 7.1. The Hoosic River originates in northwestern Massachusetts, flows northwest through Vermont, and west into New York. Within New York, the river flows west for approximately 34 miles before converging with the Hudson River near Stillwater. Approximately 48 percent of the watershed is within New York State. The major tributaries to the Hoosic River are the Owl Kill, the Walloomsac, and the Little Hoosic rivers, resulting in a cumulative drainage area of 730 square miles. The river's average gradient is 14 feet per mile, but its steepest section drops 150 feet over the 2-mile Schaghticoke gorge.

1.1 PROJECT DESCRIPTION

The Project consists of the following two developments on the Hoosic River: Johnsonville Development and Schaghticoke Development. The two developments have a total installed capacity of 18.5 MW.

Johnsonville - The Johnsonville Development includes a 39-foot-high, 526-foot-long concrete gravity dam topped with 2.5-foot-high wooden flashboards; a 450-acre reservoir; a sluice gate; a forebay structure; an intake structure equipped with 1inch-inch clear-spaced vertical trashracks; a powerhouse containing two turbine generators with a total installed capacity of 2,100 kilowatts (kW). The Johnsonville facility has no bypass reach.

Schaghticoke - the Schaghticoke Development includes a 28 foot high, 700 foot long concrete gravity dam topped with 2.5 foot high wooden flashboards; a reservoir with a 150 acre surface area; a 2,300 foot-long open canal; a forebay; a pipeline intake equipped with 2.5 inch clear-spaced vertical trashracks; an 850 foot-long 12.5 foot diameter steel pipeline; a surge tank; four penstocks; and a powerhouse containing four turbine generators with a total installed capacity of 16,400 kilowatts (kW). The canal, forebay, pipeline and penstocks create a two-mile bypassed reach between the dam and the powerhouse.



FIGURE 1. OVERVIEW OF HOOSIC RIVER HYDROELECTRIC PROJECT

1.2 PROJECT OPERATIONS

Project operations follow the flow requirements and reservoir target elevations as defined in the FERC License which requires a continuous year-round base flow below Schaghticoke and base flows below both developments while operating within daily reservoir fluctuation limits.

1.3 REGULATORY AND COMPLIANCE HISTORY

The Hoosic River hydroelectric project was recertified in 2015 with the condition that Brookfield would provide a proactive procedure that can be followed during the winter season to prevent ice buildup problems at their facilities and to reduce the occurrence of water level or flow violations that have been evident in the past. A final report documenting the improved operating procedures will be provided to LIHI along with the first annual compliance letter following recertification. If similar violations of water level or flow requirements occur in future years, they shall be reported in the annual compliance letters to LIHI. These annual reports shall contain copies of any pertinent correspondence and documents, as well as a description of any corrective actions taken.

Brookfield implemented remedial measures to mitigate the effects of freezing temperatures on the instrument and stilling well; however the measures proved to be only moderately effective. The final solution was to install a pressure type transducer as a secondary monitoring device as this type of transducer is rarely affected by freezing temperatures. The transducer was installed as a redundant instrument to the original sonic type thereby also providing the control center with both a primary and secondary means for monitoring and verifying impoundment level. The pressure transducer was fully commissioned in March 2016 and it is expected that this will resolve the pond level instrumentation issue during periods of freezing temperatures and will also address the condition of LIHI recertification for the Hoosic River project. To date, there have been no additional pond level excursions since the implementation of the secondary monitoring device.

1.4 HOOSIC RIVER FACILITY DESCRIPTION INFORMATION (LIHI CERTIFICATE #13)

Information Type	Variable Description	Response (and reference to further details)
Name of the Facility	Facility name (use FERC project name if possible)	Hoosic River Hydroelectric Project (FERC No. 2616).
	River name (USGS proper name)	Hoosic River
	River basin name	Hudson River Drainage Basin
Location	Nearest town, county, and state	Schaghticoke and Johnsonville, New York
	River mile of dam above next major river	The Schaghticoke Development is located at RM 7.1 and the Johnsonville Development is located at RM

TABLE 1.FACILITY DESCRIPTION INFORMATION FOR HOOSIC
RIVER HYDROELECTRIC PROJECT (LIHI #13)

Information Type	Variable Description	Response (and reference to further details)
		13.3 on the Hoosic River.
	Geographic latitude	42°53'50.58"N (Schaghticoke), 42°55'12.84"N (Johnsonville)
	Geographic longitude	73°35'38.72"W (Schaghticoke), 73°30'31.57"W (Johnsonville)
	Application contact names:	Danny Maguire 184 Elm Street Potsdam NY, 13676
Facility Owner	Facility owner (individual and company names)	Erie Boulevard Hydro, L.P, a subsidiary of Brookfield Renewable Energy Group,
	Operating affiliate (if different from owner)	N/A
	Representative in LIHI certification	Jot Splenda WSP 1001 Wade Ave # 400, Raleigh, NC 27605
	FERC Project Number, issuance and expiration dates	Project No. 2616 Issued: 11/1/2002 (40 years) Expires: 11/1/2042
	FERC license type or special classification	Major
Regulatory Status	Water Quality Certificate identifier and issuance date, plus source agency name	A Water Quality Certificate (WQ-6-4099- 00007/0001) was issued by the New York Department of Environmental Conservation on October 13, 2006 (Appendix C).
	Hyperlinks to key electronic records on FERC e-library website (e.g., most recent	2002 FERC License WQC
	Commission Orders, WQC, ESA documents, etc.)	
	Date of initial operation (past or future for operational applications)	The dams were built in 1909, and Brookfield took over ownership from Niagara Mohawk Power in 1999, and the Project was relicensed by FERC in November 2002
	Total name-plate capacity (MW)	18.5 MW
	Average annual generation (GWh)	83.0 GWh

Information Type	Variable Description	Response (and reference to further details)	
Power Plant	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	The Johnsonville powerhouse contains two turbines, each with a capacity of 1,050 kW, for a total of 2,100 kW of installed capacity. The combined maximum hydraulic capacity of the two units is 1,288 cfs.	
Character-		turbines, each with a capacity of 4,100 kW,	
istics		for a total of 16,400 kW of installed	
		capacity. The combined maximum hydraulic capacity of the four units is 1.640	
		cfs.	
	Modes of operation (run-of-river, peaking, pulsing, seasonal storage, etc.)	Peaking	
	Dates and types of major equipment upgrades	No major equipment upgrades have occurred at the Project.	
	Dates, purpose, and type of any recent operational changes	No major operational changes have occurred at the Project.	
	Plans, authorization, and regulatory activities for any facility upgrades	By a letter dated February 27, 2019, Brookfield notified FERC that it did not intend to reinstall the flashboards on the Johnsonville Development at that time. and was review the possibility of removing the flashboards from the FERC license. Brookfield is continuing to asses a suite of complex decisions related to the fate of the flashboards. As such, Brookfield feels it is premature to suggest that the flashboards will never be reinstalled and is continuing to maintain the Project as it is currently licensed.	
Character- istics of	Date of construction	The Johnsonville and Schaghticoke dams were built between 1909 and 1910.	
Dam, Diversion	Dam height	Johnsonville: 39-feet-high Schaghticoke: 28-feet-high	
or Conduit	Spillway length and elevation and	Johnsonville (529-feet-long; crest elevation of 346 feet mean sea level (msl)) Schaghticoke (700-feet-long; crest elevation of 267.35 feet msl)	

Information Type	Variable Description	Response (and reference to further details)
	Tailwater elevation	Johnsonville (311.0 feet msl)
		Schaghticoke (229.8 feet msl)
	Length and type of all	Johnsonville: 48-foot-long, 54-foot-wide concrete
	penstocks and water	intake structure
	conveyance structures between reservoir and powerhouse	Schaghticoke: an 850-foot-long, 12.5-foot-diameter steel pipeline
		Schaghticoke forebay and canal: Approximately 2,300 feet long; generally 15.6 feet deep and 28 to 48 feet wide at various sections
	Dates and types of major, generation- related infrastructure improvements	No major equipment upgrades have occurred at the Project
	Designated facility purposes	The purpose of this facility is to generate power to be supplied to the local grid.
	Water source	Hoosic River
	Water discharge location or facility	Water utilized by each development discharges directly into the waters of the Hoosic River directly below each development's powerhouse.
	Gross volume	Johnsonville (6,430 acre-feet) Schaghticoke (1,150 acre-feet)
	Surface area at full pool	Johnsonville (450 acres; 346.0 feet msl, with pneumatic flashboards) Schaghticoke (150 acres; 267.4 feet msl with pneumatic flashboards)
	Maximum water surface elevation (ft. MSL)	See above.
	Normal maximum water surface elevation for	Johnsonville (346.0 feet msl, with pneumatic flashboards)
Characte-	available	Schaghticoke (267.4 feet msl, with pneumatic flashboards)
Reservoir		Upstream Dam: Hoosick Falls Dam (Hoosick
and		Falls Project)
Watershed	Unatura and de () 1	Owner: Hydro Power Inc.
	Upstream dam(s) by	FEKU NO.: 248/ Divor Milo
	FFRC number (if	$(\mathbf{R}\mathbf{M}) \cdot 133$
	applicable), and river	Status: In

mile		Service
		Downstream Dam: None (Hudson River) Owner: NA FERC No.: NA RM: NA Status: NA
Operation with up downstr that affe availabi facility	ng agreements stream or ream reservoirs ect water ility, if any, and operation	Project operations follow the flow requirements and reservoir target elevations as defined in the FERC License which requires a continuous year-round base flow below Schaghticoke and base flows below both developments while operating within daily reservoir fluctuation limits
Area insi boundary appropria	de FERC project y, where ate	84.2 acres +/-

	Average annual flow at	Johnsoneville (1,160 cfs)	
	the development dams	Schaghticoke (1,185 cfs)	
	(prorated for dam		
	location)		
		Annual Monthly Mean for	January – 906 cfs
	Average monthly flows	the period 1910 through	February – 941 cfs
	of the Hoosic River near	2018:	March – 1,670 cfs
	Eagle Bridge, NY		April – 2,260 cfs
Hydrologic			May – 1,260 cfs
Setting	USGS Gage 01334500		June – 735 cfs
0			July – 473 cfs
			August – 398 cfs
			September – 424 cfs
			October – 585 cfs
			November – 903 cfs
			December – 1,040
			cfs

		USGS Gage 01334500 is located at:
		Lat 42°36'19" long 73°22'37" Rensselaer County
		NY. Hydrologic Unit 02020003, near the town of
	Location and name of	Eagle Bridge NY, about 9.5 river miles upstream of
	relevant stream gauging	Johnsonville Dam.
	stations above and	
	below the facility	USGS Gage 01334500 is located at:
		Lat 42°56'19", long 73°22'37", Rensselaer County.
		NY. Hydrologic Unit 02020003. On the Hudson
		River at the Lock 4 State Canal Parke just upstream of
		the confluence with the Hoosic River.
	Watershed area at the	Johnsonville (606 square miles)
	dam	Schaghticoke (619 square miles)
		Johnsonville
		Development
	Number of zones of	Downstroom ZOE
	Downstream)	
	Downstream)	Schaghticoke
		Development
		Impoundment ZOE
		Bypass ZOE
		Downstream ZOE
		See Appendix A for a depiction of Project ZOEs.
		Johnsonville Development
Designated Zones of Effect		Zone 1 Impoundment ZOE: RM 25 (Hoosick Falls Powerhouse) to RM 13.3 (Johnsonville Dam)
	Upstream and downstream locations by river miles	Zone 2 Downstream ZOE: RM 13.3 (Johnsonville Powerhouse) to RM 9.3 (Valley Falls Dam)
		Schaghticoke Development
		Zone 1 Impoundment ZOE: RM 9.3 (Valley Falls Powerhouse) to RM 7.1 (Schaghticoke Dam)
		Zone 2 Bypass ZOE: RM 7.1 (Schaghticoke Dam) to RM 5.1 (Schaghticoke powerhouse tailrace)
		Zone 3 Downstream ZOE: RM 5.1 (Schaghticoke Powerhouse tailrace) to RM 0 (Confluence with the

		Hudson River)
	Type of waterbody (river, impoundment, by-passed reach, etc.)	According to the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory ¹ , the Impoundment ZOEs are classified as lake areas, the Bypass Reach ZOEs and downstream ZOEs are classified as a riverine area.
		Johnsonville Development
		Impoundment ZOE: RM 25 (Hoosick Falls Dam) to RM 13.3 (Johnsonville Dam)
		Downstream ZOE: RM 13.3 (Johnsonville Dam) to RM 9.3 (Valley Falls Dam)
	Delimiting structures	Schaghticoke Development
		Impoundment ZOE: RM 9.3 (Valley Falls Dam) to RM 7.1 (Schaghticoke Dam)
		Bypass ZOE and Downstream ZOE: RM 7.1 (Valley Falls Dam) to RM 0
	Designated uses by state water quality agency	New York Department of Environmental Conservations designates waters in the Hoosic River near the Hoosic River Project watershed as Class B fresh surface waters. The Schaghticoke Reservoir is Class C
		The best usages of Class B waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish, shellfish and wildlife propagation and survival. ²
		The best usage of Class C waters is fishing. These waters shall be suitable for fish, shellfish and wildlife propagation and survival. The water quality shall be suitable for primary and secondary

¹ <u>https://www.fws.gov/wetlands/</u> ² <u>https://www.dec.ny.gov/chemical/23853.html</u>

		contact recreation, although other factors may limit the use for these purposes
Information Type	Variable Description	Response (and reference to further details)
Additional Contact	Names, addresses, phone numbers, and e- mail for local state and federal resource agencies	Please see section 4.0 for the Project Contacts Form
Information	Names, addresses, phone numbers, and e- mail for local non- governmental stakeholders	Please see section 4.0 for the Project Contacts Form
Photograph s and Maps	Photographs of key features of the facility and each of the designated zones of effect	Please see Appendix A for photographs of key features of the facility and identification of each designated ZOE, and for project drawings.
<i>p</i> o	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 STANDARD MATRICES

2.1 Johnsonville Development

Impoundment ZOE

Critorian		Alternative Standards					
	Criterion		2	3	4	Plus	
А.	Ecological Flow Regimes	Χ					
B.	Water Quality		Χ				
C.	Upstream Fish Passage	Χ					
D.	Downstream Fish Passage		Χ				
E.	Watershed and Shoreline Protection		Χ				
F.	Threatened and Endangered Species Protection			Χ			
G.	Cultural and Historic Resources Protection		Χ				
H.	Recreational Resources		Χ				

Downstream ZOE

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

2.2 Schaghticoke Development

Impoundment ZOE

	Criterion		Alternative Standards					
			2	3	4	Plus		
Α.	Ecological Flow Regimes	Χ						
B.	Water Quality		X					
C.	Upstream Fish Passage	Χ						
D.	Downstream Fish Passage		X					
Ē.	Watershed and Shoreline Protection		X					
F.	Threatened and Endangered Species Protection			X				

	Crittorion			Alternative Standards					
	Criterion		2	3	4	Plus			
G.	Cultural and Historic Resources Protection		X						
H.	Recreational Resources		X						

Bypass Reach ZOE

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

Downstream ZOE

C. it.		Alternative Standards					
	Criterion		2	3	4	Plus	
A.	Ecological Flow Regimes		X				
B.	Water Quality		X				
C.	Upstream Fish Passage	X					
D.	Downstream Fish Passage	X					
E.	Watershed and Shoreline Protection	X					
F.	Threatened and Endangered Species Protection			Χ			
G.	Cultural and Historic Resources Protection		X				
H.	Recreational Resources		X				

3.0 SUPPORTING INFORMATION

3.1 – Ecological Flow Impoundment ZoEs – Both Developments

Criterion	Standard	
А	1	Not Applicable / De Minimis Effect:
		 Confirm the location of the powerhouse relative to other dam/diversion structures to establish that there are no bypassed reaches at the facility. If Run-of-River operation, provide details on how flows, water levels, and operation are monitored to ensure such an operational mode is maintained. In a conduit project, identify the water source and discharge points for the conduit system within which the hydropower plant is located. For impoundment zones only, explain how fish and wildlife habitat within the zone is evaluated and managed – NOTE: this is required information, but it will not be used to determine whether the Ecological Flows criterion has been satisfied. All impoundment zones can apply Criterion A-1 to pass this criterion.

- In accordance with Article 403 of the FERC License and section 3.1 of the Hoosic River Offer of Settlement, Brookfield Renewable Energy Group is required to maintain a daily maximum reservoir fluctuation at the Johnsonville Development of not more than 0.25 feet from June 1 through September 30, and 0.5 feet from October 1 through May 31; and at the Schaghticoke Development, Brookfield Renewable Energy Group is required to maintain a daily maximum reservoir fluctuation of not more than 0.5 feet.
- Whenever an excursion occurs, Brookfield Renewable Energy Group (Brookfield) notifies FERC, USFWS, and NYSDEC as soon as possible, but no later than 10 days after each such incident.
- Brookfield submitted its final streamflow and water level monitoring plan to FERC on November 5, 2003³. FERC approved the streamflow and water level monitoring plan on March 8, 2004⁴.
- Since 2013 there have been two excursion reports for the Schaghticoke impoundment filed with FERC. FERC found that each excursion⁵ was not considered a violation of the Project's license.

³ <u>20031106-0094</u>

⁴ <u>20040308-0507</u>

⁵ <u>20150317-3000</u>, <u>20160322-3004</u>

- Three impoundment excursion events occurred in 2017 at the Johnsonville development (August 31- September 4⁶, September 12⁷, and November 12 19⁸. Brookfield informed FERC that the excursion events were due to a broken gate caused by debris and that Brookfield would repair the broken gate and install a rack system to block debris from entering the sluice gates in the future. By letter dated March 5th 2018⁹, FERC informed Brookfield that the deviations would not be considered a violation of Brookfield's license. On April 12, 2018, Brookfield informed FERC of its plan and schedule to repair all out-of-service sluice gates and trash rack designs, which FERC accepted by letter dated June 5, 2018.¹⁰ The trash rack was subsequently installed in 2018. As of September 21, 2019, Gates No. 1,2,3, and 4 had been tested and are fully operational.
- The Hoosic River hydroelectric project was recertified in 2015 with the condition that Brookfield would provide a proactive procedure that can be followed during the winter season to prevent ice buildup problems at their facilities and to reduce the occurrence of water level or flow violations that have been evident in the past. A final report documenting the improved operating procedures will be provided to LIHI along with the first annual compliance letter following recertification. If similar violations of water level or flow requirements occur in future years, they shall be reported in the annual compliance letters to LIHI. These annual reports shall contain copies of any pertinent correspondence and documents, as well as a description of any corrective actions taken.

Brookfield implemented remedial measures to mitigate the effects of freezing temperatures on the instrument and stilling well; however the measures proved to be only moderately effective. The final solution was to install a pressure type transducer as a secondary monitoring device as this type of transducer is rarely affected by freezing temperatures. The transducer was installed as a redundant instrument to the original sonic type thereby also providing the control center with both a primary and secondary means for monitoring and verifying impoundment level. The pressure transducer was fully commissioned in March 2016 and it is expected that this will resolve the pond level instrumentation issue during periods of freezing temperatures and will also address the condition of LIHI recertification for the Hoosic River project.

• To date, there have been no additional pond level excursions since the implementation of the secondary monitoring device.

⁸ 20171206-5033

⁶ <u>2017</u>0922-5124

^{7 20171122-5024}

⁹ <u>20180305-3015</u>

¹⁰ 20180605-3033

Bypass	ZoE –	Schaghticoke	Development
		Senaghineente	20,010000000

Criterion	Standard	
А	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 protective). 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 instream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations).

- In accordance with Article 402 of the FERC License and section 3.2 of the Hoosic River Offer of Settlement, Brookfield is required to maintain a year-round minimum streamflow of 60 cfs or inflow (whichever is less) into the Schaghticoke bypass reach.
- In accordance with Article 403 of the FERC License and section 3.3 of the Hoosic River Offer of Settlement, Brookfield is required to develop and implement a streamflow and water level monitoring plan.
- Brookfield Renewable Energy Group submitted its final streamflow and water level monitoring plan to FERC on November 5, 2003. FERC approved the streamflow and water level monitoring plan on March 8, 2004.
- The year-round minimum bypass flow of 60 cfs was agreed upon by the FERC and the USFWS and NYSDEC at the November 30, 1999, Section 10(j) meeting and it was assessed in the FERC's June 30, 2000 Environmental Assessment for the Hoosic River Project. The Parties have carefully reviewed alternative minimum flows to the Schaghticoke bypassed reach.
- A minimum bypass flow of 60-cfs would result in an increase in habitat for nearly all fish species and life stages. Aquatic insect production is also expected to increase, and the reach should be better suited as nursery and adult habitat for all forage and game fish. Flows to the bypassed reach in excess of the minimum flow would still occur when inflow to the project exceeds the hydraulic capacity of the turbines, which routinely occurs in the spring and occasionally from June through October. The relatively stable flow regime during this period (June through October) would coincide with the period when most young fish would be least mobile and should enhance their chances of

survival (less energy would be required to find food, and they would not be as likely to be displaced downstream by high flows).

- A minimum flow of 60-cfs would provide 95.0 percent of the maximum Weighted Usable Area (WUA) for adult walleye, (one of two species that the State manages in this pollion of the Hoosic River) and provides a net increase of 1.26 acres of WUA. For adult smallmouth bass, the other species managed by the NYSDEC in this portion of the Hoosic River, a minimum flow of 60-cfs would provide 71.7 percent of the maximum WUA. Increases in habitat occur with a 60- cfs minimum flow for forage species and invertebrates. The increase in average forage species WUA (averaged across all life stages) is 21.1 percent; the increase in average invertebrate WUA (averaged across all life stages) is 158.5 percent at 60-cfs.
- Required minimum flows to the Schaghticoke bypass reach are maintained during headpond excursion events by raising the low-level gates. In 2015 and 2016 there was 1 headpond excursion event in each year and minimum flows were maintained by raising the low-level gates. There were no headpond excursion events at the Schaghticoke Development in 2017 or 2018. In 2019 there was a baseflow excursion event due to a lightning strike on the National Grid line that tripped the powerhouse unit offline.

Criterion	Standard	
А	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 protective). 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 instream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations).

Downstream ZoE – Both Developments

• In accordance with section 3.2 of the Hoosic River Offer of Settlement, Brookfield is required to maintain a year-round base flow of flow of 220 cfs or inflow (whichever is less) immediately downstream of Johnsonville Powerhouse and 240 cfs or inflow (whichever is less) immediately downstream of Schaghticoke Powerhouse.

- In accordance with Article 403 of the FERC License and section 3.3 of the Hoosic River Offer of Settlement, Brookfield is required to develop and implement a streamflow and water level monitoring plan.
- Brookfield Renewable Energy Group submitted its final streamflow and water level monitoring plan to FERC on November 5, 2003. FERC approved the streamflow and water level monitoring plan on March 8, 2004.
- According to the Hoosic River Offer of Settlement, the base instream flows downstream of both developments will enhance the Hoosic River aquatic habitat during moderate to low flow periods in downstream reaches that were historically periodically dewatered due to hydropower operations. The agreed-upon instream base flow is designed to enhance the downstream river reaches. The base flows will enhance potential habitat for a wide variety of aquatic organisms including most life stages of game fish such as brown trout, smallmouth bass, and walleye; forage fish (longnose dace, fallfish, and white sucker); and benthic invertebrates (mayfly, stonefly, and caddisfly). The instream base flow also enhances fishing opportunity and fish movement.

	1	
Criterion	Standard	
B	2	 <u>Agency Recommendation</u>: If facility is located on a Water Quality Limited river reach, provide a link to the state's most recent impaired waters list and indicate the page(s) therein that apply to facility waters. If possible, provide an agency letter stating that the facility is not a cause of such limitation. Provide a copy of the most recent Water Quality Certificate and any subsequent amendments, including the date(s) of issuance. If more than 10 years old, provide documentation that the certification terms and conditions remain valid and in effect for the facility (e.g., a letter from the agency). Identify any other agency recommendations related to water quality and explain their scientific or technical basis. Describe all compliance activities related to water quality and any agency recommendations for the facility, including on-going monitoring, and how those are integrated into facility operations

3.2 – Water Quality All ZoEs – Both Developments

• The Hoosic River in the vicinity of the Johnsonville Development and Schaghticoke Reservoir are listed in the NYS's 2016 final Section 303(d) list of impaired

waterbodies¹¹. A fish consumption advisory is in effect due to contaminated sediments as a source of PCBs.

- Project Maintenance and Construction Condition 15 of the NYDEC 401 Water Quality Certification¹² requires Brookfield Renewable Energy Group to monitor turbidity during maintenance or construction-related activities. If at anytime, turbidity measurements from the downstream locations exceed the measurements for the upstream locations, all related construction on the Project must cease until the source of the turbidity is discovered and the situation is corrected. All conditions in the Water Quality Certification are attached to this Application as Appendix C. NYSDEC informed Brookfield by email dated August 14th 2019, that all conditions in the Water Quality Certification are still valid and in full effect for the Hoosic River Project (Appendix D).
- In May of 2018¹³ and 2019¹⁴, Brookfield informed the NYSDEC of planned Schaghticoke impoundment drawdowns to perform flashboard-related work. As part of this work, sediment was cleared from the dam. NYSDEC notified Brookfield that the planned drawdowns and associated work was acceptable.
- A review of project filings on FERC's elibrary indicates that the licensee is in compliance with its water quality-related requirements. Furthermore, Brookfield notifies FERC of any planned drawdowns for construction and maintenance activities. Per the requirements of the water quality certification, the reservoir is not drawn down or refilled at a rate faster than 1 foot per hour.

3.3 – Upstream Fish Passage

American eel are the only migratory fish species documented to inhabit the project area. In general, the Hoosic River in the project area supports both warm- and coldwater fish species, but the fish community is dominated by warmwater species. Common species include shinner, sopttail shiner, golden shiner, fallfish, carp, white sucker, rainbow and brown trout, northern pike, largemouth and smallmouth bass, rock bass, black crappie, pumpkinseed, bluegill, and yellow perch. On March 10, 2000, USFWS confirmed that no threatened or endangered fish species inhabit the Hoosic River in the project area.

¹¹ https://www.dec.ny.gov/docs/water_pdf/303dListfinal2016.pdf

¹² 20020926-0378

¹³ 20180522-5240

¹⁴ 20190517-5181

Impoundment ZoE – Both Developments

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

• There are no facilities in the impoundment ZoEs that act as a barrier to upstream fish passage. As stated earlier American eel are the only migratory species in the area and the eel conveyance system on the Schaghticoke Dam and at the Johnsonville Dam allow for upstream passage.

Downstream ZoE – Schaghticoke Development

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

• There are no facilities in the Schaghticoke downstream ZoE that act as a barrier to upstream fish passage because the Schaghticoke bypass reach ZoE is immediately upstream the Schaghticoke downstream ZoE. As stated earlier American eel are the only migratory species in the area and the eel conveyance system on the Schaghticoke Dam and at the Johnsonville Dam allow for upstream passage.

Johnsonville downstream and Schaghticoke bypass ZoEs

Criterion	Standard	
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 protective). 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

- By letter dated May 24, 1996, the Department of Interior (DOI) once prescribed upstream and downstream passage for American Eel at Schaghticoke and reserved authority for same at Johnsonville. However, by letter dated August 28, 2002, the DOI indicated that the Offer of Settlement (signed by DOI in July 2002) superseded the terms and conditions prescribed in their May 24, 1996 letter, and stated that their 1996 Section 18 prescription should be considered modified to conform to specifications contained in the Offer of Settlement. The FERC license and Offer of Settlement require the phased installation of upstream eel conveyance and downstream fish movement systems at both Johnsonville and Schaghticoke. Installation of fish protection and upstream eel conveyance systems at both Johnsonville and Schaghticoke were completed in 2006.
- Historically, the falls at Schaghticoke limited the upstream movements for most fish species in the river; however, Interior indicated that there are sufficient ledges, cracks and flumes in the falls to likely allow American eel to ascend them. FERC noted in the 2000 Final Environmental Assessment for the Hoosic River Project, that American eel are common in the river downstream of Schaghticoke dam, but absent from fish samples collected upstream of the dam and samples at the Johnsonville Development.
- Final design plans for an upstream American eel conveyance system (eel ladder) for the Schaghitocke Development were filed with FERC on November 5, 2003. On January 15, 2004, FERC approved the plan¹⁵. The eel ladder design utilizes a cable tray that is lined with Enkamat mesh material to provide a surface with traction. This structure is mounted to brackets attached to the concrete abutment at the east end of the Schaghticoke dam. The structure will be placed as far as possible above the nappe associated with the 10-year flood to reduce impacts due to spillage events. An operation flow of 2 gallons per

¹⁵ <u>20040115-3022</u>

minute is provided in the eel conveyance system. Since power is not available at this location, a gravity siphon pump regulator system was installed to provide the operation flow. The ladder intake is located such that the siphon flow can occur even if some/all of the wooden flashboards have failed. Given the provision of 60 cfs instream flow when some/all of the wooden flashboards have failed will occur as weir flow over the crest of the dam, the gravity siphon will receive inflow when positioned at, or slightly below, the crest of the dam. Similarly, the eel conveyance system is operational between June 15th and September 15th. A review of eLibrary indicates that there are no issues related to upstream eel passage.

Final design plans for an upstream American eel conveyance system (eel ladder) for the Johnsonville Development were filed with FERC on August 14, 2006. The design plans were similar to the conveyance system designed for eel ladder at Schaghticoke Dam. In review of the design, FWS made the following recommendations: (1) provide an operating flow of 20 gpm via the spray bar at the top of the eel ramp, 10 gpm going down the eel ladder and the other 10 gpm released over the discharge chute (leading to the reservoir); (2) use half akwadrain media (comprised of semi-tubular elements) in the eel ladder for the slightly larger eels; (3) accommodate a means of counting eels passing into the project reservoir, as well as any necessary modifications to the discharge chute to accommodate such a counting facility; (4) provide access for personnel to clean and service the eel ladder; (5) install a hinged cover for the eel ramp to minimize predation, eel escape, and trash collection, as well as to provide darker conditions for passage. FERC issued an order on September 14, 2006 approving the plan with the following modifications: (1) use two types of media, enkamat and akwadrain, to line the eel ladder; (2) install a hinge cover over the eel ladder; and (3) determine the appropriate operation flow by October 31, 2007. On December 11, 2007, the Licensee requested an extension of time until October 31, 2008 to establish the appropriate operation flow due to ongoing difficulties with the ram pump feature of the eel ladder. Continued problems with the ram pump, resulted in further delays ultimately requiring the ram pump to be replaced in 2009 with a solar-power pump. An actual demonstration of the system with the agencies was performed on October 28, 2009. A summary report on the eel conveyance system was submitted to FERC on March 12, 2010¹⁶. On May 6, 2010¹⁷, FERC accepted and approved the eel conveyance system and suggested operation flow. A review of eLibrary indicates that there are no issues related to upstream eel passage.

¹⁶ <u>20100312-5074</u>

^{17 20100510-0389}

3.4 – Downstream Fish Passage and Protection Impoundment and Bypass ZoEs – Both Developments

Criterion	Standard	
D	2	 <u>Agency Recommendation</u>: 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 protective). 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 FERC license and Offer of Settlement require provision of an alternate route of downstream fish movement.
- At Johnsonville, this alternate route is presently afforded via the agreed upon 20 cfs bypass flow implemented via a 1.33-foot-wide by 2.5-foot-high gated orifice constructed within an existing sluice gate located adjacent to the powerhouse trashrack structure on the northern end of the dam. The size of the opening exceeds the 1.0-foot minimum height requests typically recommended by the resource agencies. The plunge pool has a depth of at least 25 percent of the height of the free fall.
- At Schaghticoke, this alternate route is presently afforded via the agreed upon 60 cfs bypass flow implemented in February 2004 through a notch in the wooden flashboard system. The 60 cfs release is considered the minimum allowable flow to be released from the notch. The settlement and license limit normal impoundment fluctuations to 0.5 feet (Settlement Section 3.1). As such, the orifice has been sized to pass 60 cfs when impoundment levels are at the bottom of the normal fluctuation, or -0.5 feet below crest of wooden flashboards (elevation 266.85 feet). Calculations indicate a 7.0 foot-wide by 1.4-foot-high orifice constructed within the 2.5-foot-high flashboards pass approximately 61 cfs when impoundment levels are at the crest of flashboards.
- According to the Offer of Settlement the trashracks at the Johnsonville Development had 2-inch clear spacing between vertical bars and their location does not create an area of high velocity in front of the intake (maximum approach velocities estimated at 0.8 fps). However, in its 2006 final design plans for fish passage, Erie informed FERC that because of the difficulties of using the 1.5-inch diameter perforated plate overlay required by the Settlement Agreement, it would install permanent trashracks with 1-inch

clear spacing at the Johnsonville development¹⁸. The overlays should prevent downstream migrant American eels, as well as many adults of other species from entering the turbines. These devices may also behaviorally deter smaller fish that generally have a higher survival rate during turbine passage. The above-mentioned flows should provide adequate downstream migration routes for American eels and other species moving down river.

- According to the Offer of Settlement the trashracks at the Schaghticoke Development had 2 1/8-inch clear spacing between vertical bars and their location does not create an area of high velocity in front of the intake (maximum approach velocities estimated at 1.5 fps). However, because the original design proved difficult to implement at the Schaghticoke Development, Brookfield installed permanent (i.e. year-round) trashracks having 1-inch spacing in 2004. The above-mentioned flows should provide adequate downstream migration routes for American eels and other species moving down river.
- One-inch clear spaced trash racks have been installed at both facilities as agreed upon with the FERC, USFWS, and NYSDEC.

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

Downstream ZoE – Both Developments

• There are no facilities in the downstream ZoE that act as a barrier to downstream fish passage. As stated earlier American eel are the only migratory species in the area and downstream passage at the upstream barrier (Schaghticoke Dam) is available via a yearround 60 cfs instream flow, or inflow (whichever is less), through an orifice constructed with the 2.5-foot-high wooden flashboard section of the Schaghticoke Dam near the vicinity of the east end of the dam.

¹⁸ <u>20060817-0101</u>

3.5 – Shoreline and Watershed Protection Impoundment ZoE – Both Developments

Criterion	Standard	
E	2	 <u>Agency Recommendation</u>: Provide copies or links to any agency recommendations or management plans that are in effect related to protection,
		 mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans). Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.

- Article 401 of the FERC License Order and Section 3.1.1 of the Offer of Settlement require the Licensee to install pneumatic flashboards on the spillway at Johnsonville Dam, and on the straight section of the spillway at Schaghticoke Dam in order to facilitate reservoir level control. Proper reservoir level control limit shoreline erosion.
- In October 2005 the Licensee filed as-built drawings of the of the installed pneumatic flashboards¹⁹
- The licensee reserved the right to install pneumatic flashboards on the Johnsonville Dam in the future; currently, 2.5-foot-high wooden flashboards are installed along the entire length of the spillway.
- Brookfield Renewable Energy Group submitted its final streamflow and water level monitoring plan to FERC on November 5, 2003. FERC approved the streamflow and water level monitoring plan on March 8, 2004.
- The most recent FERC Environmental and Public Use Inspection Report²⁰ indicates that the project is in compliance with Article 401 the FERC License Order and Section 3.1.1 of the Offer of Settlement.

¹⁹ <u>20051011-0215</u> ²⁰ 20140106-3013

Bypass and Downstream ZoEs – Both Developments

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

- The Hoosic Project is located in a rural area dominated by forests and farmland. Land cover units with nonsignificant ecological value identified within the vicinity of the Project can be found in Table 2 (based on National Land Cover Database 2011)²¹.
- There are no requirements for a buffer zone, shoreline protection fund or shoreline management plan for the Hoosic Project

2011.	
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.
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

Table 2.Project area land cover and classified by the national land cover database
2011.

²¹ <u>https://www.mrlc.gov/viewer/</u>

Class/Value	Classification Description
	maintain their leaves all year. Canopy is never without
	green foliage.

3.6 – Threatened and Endangered Species Protection All ZoEs –Both Developments

Criterion	Standard	
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.
		 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

- Article 409 of the FERC License Order required the licensee to file an endangered Species Management plan and schedule to conduct surveys for the Karner blue butterfly or it's obligate host species the blue lupine. The plan²² included provisions for: (1) identification of potential survey sites and areas that could be excluded from the survey, (2) measures to be taken to protect the Karner blue butterfly and blue lupine if found at the survey sites, (3) steps to be taken to insure implementation of appropriate protective measures, and (4) an implementation schedule.
- The USFWS concurred with the finding that the Hoosic River Project is not likely to adversely affect the Karner blue butterfly. The plan was submitted to FERC on January 20, 2004. On February 12, 2004, FERC approved the plan and ordered that the filed reports satisfy the requirements of for Article 409²³.
- The licensee conducted surveys in 2003 for the presence of the endangered Karner blue butterfly and its obligate host species blue lupine, pursuant to license article 409. During the two surveys conducted in 2003, blue lupine and Karner blue butterfly were found to be absent. The licensee appears to be in compliance with its requirements with regard to fish and wildlife species.
- on August 12th, 2019 NYSDEC was consulted for an updated list of state-listed threatened and engendered species in the vicinity of the Hoosic River Project. NYSDEC responded that the requested information would take 4-6 weeks to process and respond

²² <u>20030728-0193</u>, <u>20040122-0118</u>

²³ <u>20040213-0151</u>

(Appendix F). In the meantime, the NYSDEC's Environmental Resource Mapper and the Environmental Assessment Form Mapper tools²⁴ were used to identify the potential occurrences of state-listed species in the vicinity of the Johnsonville and Schaghticoke Developments. The NYSDEC mapping tool identified the following two species:

- The bald eagle was the only state-listed species listed within the vicinity of the Johnsonville Development. FERC concluded in its 2002 License Order for the Hoosic Project that bald eagles overwinter within the project area and feed primarily on waterfowl and fish and that the proposed operational and recreational measures would not substantially affect the distribution and abundance of these prey species and no effects on bald eagles are expected. A review of the FERC record indicates no issues between project operations and bald eagles exist.
- The provancher's fleabane was the only state-listed species listed within the vicinity of the Schaghticoke Development. The provancher's fleabane is a biennial vascular plant that grows along Cliffs along the Hudson River and seasonally exposed and scoured calcareous bedrock of large rivers²⁵ and specifically in rocky crevices along rivers and streams where it can receive splashed water.²⁶ Based on these habitat conditions, the provancher's fleabane would most likely exist in the bypass reach; however, this has not been confirmed by NYSDEC.

3.7 – Cultural and Historic Resource Protection All ZoEs – Both Developments

Criterion	Standard	
G	2	 <u>Approved Plan</u>: Provide documentation of all approved state, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility. Document that the facility is in compliance with all such plans

- Article 407 of the FERC License Order required the Licensee to implement the Programmatic Agreement. The licensee filed its Cultural Resources Management Plan in October 2004.
- The New York State Historic Preservation Officer (SHPO) determined that the Schaghticoke Development meets criteria A and C for inclusion in the National Register of Historic Places as an intact example of early 20th century hydroelectric-generating

²⁴ <u>http://www.dec.ny.gov/animals/31181.html</u>

²⁵ <u>http://newyork.plantatlas.usf.edu/Plant.aspx?id=6987</u>

²⁶ https://www.wildflower.org/plants/result.php?id_plant=ERPHP2

facility. Several features, including the Francis turbine and General Electric generators, ogee concrete gravity dam, gates, and powerhouse, were found to have retained their integrity and significance.

• The Licensee files annual Cultural Resources Management Plans with FERC.

3.8 – Recreational Resources

All ZoEs – Both Developments

Standard	
2	 <u>Agency Recommendation</u>: 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.
	Standard 2

- Article 406 of the FERC License Order and Section 3.5.1 of the Offer of Settlement required the Licensee to develop and implement several recreational enhancement measures as well as a plan to implement and manage recreational resources in the project area.
- The Licensee submitted its final Recreation Plan to FERC on May 11, 2004²⁷. FERC modified and approved the plan on April 7, 2004²⁸.
- The licensee has filed the required as-built drawings²⁹, and FERC approved the drawings on October 31, 2006³⁰.
- Regarding whitewater release events in the Schaghticoke bypass reach, the licensee adheres to the provisions of the Offer of Settlement, which states that the whitewater release event(s) will equal the optimal flow as defined in the whitewater feasibility study or match the inflow to the Johnsonville Development, whichever is less. The whitewater release flow study did not examine flows greater than 1,600 cfs; therefore, the licensee postpones the release if inflow to the Johnsonville Development greater than 1,600 cfs or is less than 800 cfs.
- Per section 3.5.1 (e) of the Offer of Settlement, Brookfield and American Whitewater are to meet every 5 years from the date of the FERC License issuance to review aspects

²⁷ <u>20040512-0063</u>, <u>20040512-0062</u>

²⁸ 20050407-3009

²⁹ <u>20060503-0183</u>

³⁰ <u>20061031-3021</u>

of the whitewater release program. Most recently Brookfield and American Whitewater agreed to a new 5-year schedule that establishes 2021 for a review period of the program.

- The licensee also allows access to an area of the impoundment known as Electric Lake
- The licensee is in compliance with access, accommodations and facility conditions of the FERC license and the Offer of Settlement. The most recent FERC environmental and public use inspection reports³¹ note that the licensee appears to be in compliance with its requirements with regard to recreation resources.

³¹ <u>20140106-3013</u>, <u>20080818-0302</u>

4.0 CONTACTS FORMS

Project Owner:	
Name and Title	
Company	Erie Boulevard Hydropower, L.P., a subsidiary of Brookfield Renewable
Phone	
Email Address	
Mailing Address	200 Donald Lynch Boulevard, Marlborough, MA 01752
Consulting Firm / Age	ent for LIHI Program (if different from above):
Name and Title	Jot Splenda
Company	Louis Berger/WSP
Phone	(919) 866-4417
Email Address	jsplenda@louisberger.com
Mailing Address	1001 Wade Ave; Suite 400; Raleigh, NC 27615
Compliance Contact (responsible for LIHI Program requirements):
Name and Title	Daniel J. Maguire, P.E., Compliance Manager
Company	Brookfield Renewable
Phone	315-267-1036
Email Address	Danny.Maguire@brookfieldrenewable.com
Mailing Address	184 Elm Street, Potsdam, NY 13676
Party responsible for	accounts payable:
Name and Title	Judith Charette
Company	Brookfield Renewable
Phone	1-819-561-8099
Email Address	AP@brookfieldrenewable.com
Mailing	41 Victoria, Gatineau, QC J8X 2A1
Address	
Name and Title	Sandeep Mascarenhas, Senior Analyst, Capacity & Ancillary Services Management
Company	Brookfield Renewable
Phone	819-561-2722 ext. 6743
Email Address	Sandeep.Mascarenhas@brookfieldrenewable.com
Mailing Address	41 Victoria, Gatineau, QC J8X 2A1

Agency Contact (Check area of responsibility: Flows_X_, Water Quality _X_, Fish/Wildlife		
Resources _X_, Watersheds, T/E Spp, Cultural/Historic Resources, Recreation		
X):		
Agency Name	New York State Department of Environmental Conservation	
Name and Title	Chris VanMaaren, Regional Fisheries Manager	
Phone	(607) 652-2620	
Email address	chris.vanmaaren@dec.ny.gov	
Mailing Address	65561 State Hwy 10, Stamford, N.Y. 12167-5029	

Agency Contact (Check area of responsibility: Flows_, Water Quality _, Fish/Wildlife		
Resources, Watersheds, T/E SppX_, Cultural/Historic Resources, Recreation		
Agency Name	New York State Department of Environmental Conservation – NY	
	Natural Heritage Program	
Name and Title	Heidi Krahling, Environmental Review Specialist	
Phone	518-402-8913	
Email address	Heidi.krahling@dec.ny.gov	
Mailing Address	625 Broadway, 5 th floor, Albany, NY 12233-4757	

Agency Contact (Check area of responsibility: Flows_, Water Quality _, Fish/Wildlife		
Resources, Watersheds, T/E SppX_, Cultural/Historic Resources, Recreation		
):		
Agency Name	U.S. Fish and Wildlife Service	
Name and Title	Robyn Niver, Endangered Species Biologist	
Phone	607-753-9334	
Email address	Robyn_Niver@fws.gov	
Mailing Address	3817 Luker Road, Cortland, NY 13045	

Agency Contact (Check area of responsibility: Flows_X_, Water Quality _X_, Fish/Wildlife		
Resources _X_, Watersheds, T/E SppX_, Cultural/Historic Resources, Recreation		
Agency Name	U.S. Fish and Wildlife Service	
Name and Title	Steve Patch	
Phone	607-753-9334	
Email address	Stephen_Patch@fws.gov	
Mailing Address	3817 Luker Road, Cortland, NY 13045	

Agency Contact (Check area of responsibility: Flows_, Water Quality _, Fish/Wildlife		
Resources, Watersheds, T/E Spp, Cultural/Historic Resources _X_, Recreation):		
Agency Name	New York State Division for Historic Preservation	
Name and Title	Michael Lynch, Division Director	
Phone	518-237-8643	
Email address	Michael.Lynch@parks.ny.gov	
Mailing Address	Peebles Island State Park, P.O. Box 189, Waterford, NY 12188-0189	

Agency Contact (Check area of responsibility: Flows_, Water Quality _, Fish/Wildlife		
Resources, Watersheds, T/E Spp, Cultural/Historic Resources, Recreation _X_)		
Agency Name	American Whitewater	
Name and Title	Bob Nasdor	
Phone	828-5886-1930	
Email address	Bob@americanwhitewater.org	
Mailing Address	P.O. Box 1540 Cullowhee, NC 28723	

5.0 SWORN STATEMENT
B.3 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 Erie Boulevard Hydro, L.P. , 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 LIHI Certification of the applying facility is granted, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified®.

The Undersigned 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 FOR PRE-OPERATIONAL CERTIFICATIONS (see Section 4.5.3):

The Undersigned acknowledges that LIHI may suspend or revoke the LIHI Certification should the impacts of the facility, once operational, fail to comply with the LIHI program requirements.

Company Name: Erie Boulevard Hydro, L.P, a subsidiary of Brookfield Renewable Energy Group

Authorized Representative:

Daniel Maguire P.E. Name:

Title:	Compliance Manager	

Authorized Signature: <u>N/M</u> Date: <u>5/28/2019</u>

APPENDIX A

PROJECT ZOES, PHOTOS, & DRAWINGS



Figure 2. Overview Map of the Johnsonville Development and Zones of Effects.



Figure 3. Overview Map of the Schaghticoke Development and Zones of Effects.



Figure 4. Close up Map of the Johnsonville Development.



Figure 5. Close up Map of the Schaghticoke Development.



Figure 6. Overview Map of the Hoosic River between Hoosick Falls Dam and the Hudson River confluence.



Figure 7. Johnsonville Dam.



Figure 8. Johnsonville Powerhouse.



Figure 9. Schaghticoke Canal Intake.



Figure 10. Schaghticoke Pipeline.



Figure 11. Schaghticoke Powerhouse.



Figure 12. Schaghticoke Spillway.



Figure 13. Schaghticoke Surge Tank.



Figure 14. Johnsonville Exhibit G – Project Boundary & Location Map. Sheet no. 1 of 3.



Figure 15. Johnsonville Exhibit G – Project Boundary & Location Map. Sheet no. 2 of 3.



Figure 16. Johnsonville Exhibit G – Project Boundary & Location Map. Sheet no. 3 of 3.



Figure 17. Schaghticoke Exhibit G – Project Boundary & Location Map.

APPENDIX B

AERIAL PHOTO OF RIVER BASIN



FIGURE 18: NEW YORK STATE DRAINAGE BASINS

APPENDIX C WATER QUALITY CERTIFICATE

Unofficial FERC-Generated PDF of 20020926-0378 Received by FERC OSEC 09/25/2002 in Docket#: P-2616-000



Mr Jerry Sabattis Hydro Licensing Coordinator **Reliant Energy** 225 Greenfield Parkway, Suite 201 Liverpool, NY 13088

.

Re: Hoosic River Section 401 State Water Quality Certification, FERC Project # 2616, DECID# 4-3842-00109/00001

Dear Mr Sabattis:

Website: www.dec.state.ny.us

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Please find enclosed the Hoosic River Section 401 State Water Quality Certification, DEC Permit # 4-3842-00109/00001 issued to Erie Boulevard Power L.L.C. for the construction and operation of the Hoosic River Hydropower Project in Rensselaer County.

This permit contains significant conditions. If these conditions are unacceptable, you have the right to request a adjudicatory hearing within 30 days of this letter.

If you have any questions, or need further information please don't hesitate to contact me.

Sincerely,

Kent P. Sanders **Environmental Analyst**

cc: List Attached

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DEC PERMIT NUMBER 4-3842-00109/00001			EFFECTME DATE	220	
		T	September 19, 200	2	
ACILITY/PROGRAM NUMBER(s)		PERMIT Under the Environmental Conservation	EXPRATION DATE Coincident with the expiration da issued by the Federal Energy R Commission (FERC) for FERC P	EXPRATION DATE Coincident with the expiration date of the licen issued by the Fadaral Ene ty Regulatory Commission (FERC) for FERC Project IP-2016	
	(Check All Applicable Bouss	i) Medification X Permit to Construct X	Pervit to Coentie	7	
		Acticle 17 Titles 7 8:	Article 27 Title O. BNN/CPI		
Protection of Wate	r L	SPDES	Hazardous Waste Manage	ment	
Article 15, Title 15 Water Supply	۰ [Article 19: Air Pollution Control	Article 34: Coastal Erosion Managem	vent	
Article 15, Title 15 Water Transport	۰ [Article 23, Title 27: Mined Land Reclamation	Article 36: Floodplain Management		
Article 15, Title 15 Long Island Wells	د [Article 24: Freshwater Wetlands	Articles 1, 3, 17, 19, 27, 37 380: Radiation Control	7; 6NYCR	
Article 15, Title 27 Wild, Scenic & Re	creational Rivers	Article 25: Tidal Wetlands	Other	_	
X 6NYCRR 608: Water Quality Cer	tification	Article 27, Title 7; 6NYCRR 360; Solid Waste Management,			
PERMIT ISSUED T			TELEPHONE NUMBER		
Erie Boulevard Powe	¥ L. L. C		(315) 413-2700		
ADDRESS OF PERMITTEE	way Suite 201 Li	ivernool, New York 13088			
CONTACT PERSON FOR PERMIT	TTED WORK		TELEPHONE NUMBER	6	
Sam Hirshey, Manag	ger - Hydro Licenc	cing & Regulatory Compliance	(315) 413-2790		
NAME AND ADDRESS OF PROJE	CT#ACILITY				
Hoosic River Hydrop	ower Project, Sch	haghticoke and Johnsonville Impo	undments FERC Project # P-2616		
LOCATION OF PROJECT/FACILIT	TY				
Hoosic River at Schi	aghticoke and Jo	nnsonville, Rensselaer County.		6	
Donneolaor	Schaphticoka	Hoosic River	F-621 N 4750 00		
	Contegiticone		E 621.736 N:	4753 005	

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By acceptance of this permit, the permittee agrees that the permit is contingent upon strict compliance with the ECL, all applicable regulations, the General Conditions specified (See Page 2) and any Special Conditions included as part of this permit.

PERMIT ADMINISTRATOR William R. Adriance	ADDRESS NYSDEC Div. of En	C Div. of Envir. Permits, 4 th Floor, 625 Broadway, Albany, NY 12233-1750		
Willerim (Alvina	9/19/02	Page 1 of 5	

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NOTIFICATION OF OTHER PERMITTEE OBLIGATIONS

Item A: Permittee Accepts Legal Responsibility and Agrees to Indemnification

The permittee expressly agrees to indemnify and hold harmless the Department of Environmental Conservation of the State of New York, its representatives, employees, and agents ("DEC") for all claims, suits, actions, and damages, to the extent attributable to the permittee's acts or omissions in connection with the permittee's undertaking of activities in connection with, or operation and maintenance of, the facility or facilities authorized by the permit whether in compliance or not in compliance with the terms and conditions of the permit. This indemnification does not extend to any claims, suits, actions, or damages to the extent attributable to DEC's own negligent or intentional acts or omissions, or to any claims, suits, or actions naming the DEC and arising under article 78 of the New York Civil Practice Laws and Rules or any citizen suit or civil rights provision under federal or state laws.

Item B: Permittee's Contractors to Comply with Permit

The permittee is responsible for informing its independent contractors, employees, agents and assigns of their responsibility to comply with this permit, including all special conditions while acting as the permittee's agent with respect to the permitted activities, and such persons shall be subject to the same sanctions for violations of the Environmental Conservation Law as those prescribed for the permittee.

Item C: Permittee Responsible for Obtaining Other Required Permits

The permittee is responsible for obtaining any other permits, approvals, lands, easements and rights-of-way that may be required to carry out the activities that are authorized by this permit.

Item D: No Right to Trespass or Interfere with Riparian Rights

This permit does not convey to the permittee any right to trespass upon the lands or interfere with the riparian rights of others in order to perform the permitted work nor does it authorize the impairment of any rights, title, or interest in real or personal property held or vested in a person not a party to the permit.

GENERAL CONDITIONS

General Condition 1: Facility Inspection by the Department

The permitted site or facility, including relevant records, is subject to inspection at reasonable hours and intervals by an authorized representative of the Department of Environmental Conservation (the Department) to determine whether the permittee is complying with this permit and the ECL. Such representative may order the work suspended pursuant to ECL 71-0301 and SAPA 401(3).

The permittee shall provide a person to accompany the Department's representative during an inspection to the permit area when requested by the Department.

A copy of this permit, including all referenced maps, drawings and special conditions, must be available for inspection by the Department at all times at the project site or facility. Failure to produce a copy of the permit upon request by a Department representative is a violation of this permit.

General Condition 2: Relationship of this Permit to Other Department Orders and Determinations

Unless expressly provided for by the Department, issuance of this permit does not modify, supersede or rescind any order or determination previously issued by the Department or any of the terms, conditions or requirements contained in such order or determination.

General Condition 3: Applications for Permit Renewals or Modifications

The permittee must submit a separate written application to the Department for renewal, modification or transfer of this permit. Such application must include any forms or supplemental information the Department requires. Any renewal, modification or transfer granted by the Department must be in writing.

The permittee must submit a renewal application at least:

a) 180 days before expiration of permits for State Pollutant Discharge Elimination System (SPDES), Hazardous Waste Management Facilities (HWMF), major Air Pollution Control (APC) and Solid Waste Management Facilities (SWMF); and

b) 30 days before expiration of all other permit types.

Submission of applications for permit renewal or modification are to be submitted to:

NYSDEC Chief Permit Administrator,

625 Broadway, Albany NY 12233-1750, Telephone (518) 402-9167

General Condition 4: Permit Modifications, Suspensions and Revocations by the Department

The Department reserves the right to modify, suspend or revoke this permit in accordance with 6 NYCRR Fart 621. The grounds for modification, suspension or revocation include:

- a) materially false or inaccurate statements in the permit application or supporting papers;
 - failure by the permittee to compty with any terms or conditions of the permit; exceeding the scope of the project as described in the permit application; b)
 - C)
 - newly discovered material information or a material change in environmental conditions, relevant technology or d) applicable law or regulations since the issuance of the existing permit;
 - e) noncompliance with previously issued permit conditions, orders of the commissioner, any provisions of the Environmental Conservation Law or regulations of the Department related to the permitted activity.

DEC PERMIT NUMBER	4-3842-00109/00001		PAGE 2 OF 5

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NEW YORK STATE	DEPARTMENT OF	ENVIRONMENTAL	CONSERVATION
HERE FORM STATE	DEL MULTINEILI OL	ENTINOMALCIAIME	CONSERVATION

		Water Quality Certification	
Cer	tification		
1. TI	he New York State Department of	Environmental Conservation (Departme	ent) hereby certifies:
•	the Department has reviewed t (hereafter referred to as "the Ap submitted in support of the app Commission (FERC) in August	he certificate holders' Application for Feo oplication") and all other available pertine lication and the Offer of Settlement filed 2002.	feral Hydroelectric License ent information, including studies with the Federal Energy Regulatory
•	the Project will comply with Sec as amended and as implement regulatory requirements set for	ctions 301, 302, 303, 306, and 307 of the ed by the limitations, standards and crite th in 6NYCRR Section 608.9(a); and	Federal Water Pollution Control Ac ria of the state statutory and
•	the Project will comply with app thermal discharge criteria set for	blicable New York State effluent limitation orth in 6NYCRR Parts 700-706.	ns, water quality standards and
'his Con	s Water Quality Certification is issu trol Act (33 USC 1341).	ued solely for the purposes of Section 40	1 of the Federal Water Pollution
COI Idd	NTACTS: Except as otherwise sp ressed to:	ecified, all contact with the Department c	oncerning this certificate shall be
Vev Chie	v York State Department of Enviro ef Permit Administrator Broadway	onmental Conservation	
Alba	any, NY 12233-1750		
Vrit nus	tten submissions to the Departme st be sent to the Region 4 Permit /	nt must include five (5) complete copies Administrator, NYSDEC, 1150 Westcott f	of the submission. One (1) copy Rd, Schenectady, NY 12306-2014.
		SPECIAL CONDITIONS	
•			
A. /	AUMINISTRATION		
1.	This certificate includes and incor dated June, 2002.	porates the Hoosic River "Offer of Settle	ment" (Settlement)
2.	Inspections: The Project, includin upon reasonable notice to the ce determine whether the applicant Hoosic River Offer of Settlemen and special conditions, must be a Project.	g relevant records, is subject to inspection rtificate holder, by an authorized represent is complying with this cortification. A copt t dated June, 2002 and the FERC licens available for inspection by the Department	on at reasonable hours and intervals entative of the Department to by of this certification, including the le, including all maps, drawings, at during such inspections at the
3.	Emergencies: With the exception procedures shall apply to activitie	of emergency provisions described in the sconducted at the Project in response to	ne Settlement, the following o an emergency.
c t f	Prior to commencement of emerg to grant emergency authorization such that prior notice to the DEC 24 hours of commencement of th determination whether to grant en elegram, or other written form of o followed within 3 weeks by submis	gency activities, the NYS DEC must be n . If circumstances require that emergence is not possible, then the DEC must be n e emergency activities and be provided mergency authorization. In either case, n communication, including fax and electro ision of the following information:	otified and must determine whether cy activities be taken immediately otified by the certificate holder within sufficient information to make a otification must be by certified mail, nic mail. This notification must be
DEC	PERMIT NUMBER		PAGE <u>3</u> OF <u>5</u>

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	SPECIAL CONDITIONS
	(continued)
	1) a description of the action;
	2) location map and plan of the proposed action;
	3) reasons why the situation is an emergency
	All notifications, requests for emergency authorizations and information submitted to support such reque shall be sent to the Chief Permit Administrator at the address listed above.
4.	Modifications and Revocations: The DEC reserves the right to modify suspend or revoke this certificate w
	1) the scope of the certified activity is exceeded or a violation of any condition of this certificate or
	provision of the ECL and pertinent regulation is jourid,
	2) the certificate was obtained by instepresentation or failure to discuss relevant facts,
	3) new material minimum is used verted,
	4) environmental conditions, relevant tochnology, or applicable law or regulation have materially channed since the certificate was issued.
В.	OPERATING CONDITIONS
5.	Instream Flows: The certificate holder shall maintain instream flows in accordance with the
	Settlement, in particular, Section 3.2.
6	Flow Monitoring: The certificate holder shall develop a stream flow and water level monitoring plan
1000	consistent with the Settlement in particular Section 3.3.
7	Impoundment Fluctuations: The Schechticoke and Johnsonville reservoirs (Project reservoirs) shall be
••	in providence with the Sattlement (see subsection 3.1). Alternate impoundment
	operated in accordance with the concentrating as subsection of the relation important and and approved by NYS DEC prior to being implemented
	Emergencies shall be dealt with in accordance with special conditions #3 of this certificate.
	Eich Protection Descade and Meximum Eich protection passage and meximum
0.	provisions shall be provided in accordance with the Settlement (see Section 3.4).
C.	Project MAINTENANCE AND CONSTRUCTION
	Note: All matters pertaining to "Project Maintenance and Construction" shall be addressed to:
	Chief Permit Administrator
	New York State Department of Environmental Conservation
	625 Broadway
	Albany, NY 12233
•	Maintenance Dradoino: The certificate holder shall install and maintain anomoriate turbidity control
э.	structures while conducting any maintenance dredging activities in the intake/forebay area of the Project.
10	Sediment Analysis and Disposal: The certificate holder must sample any sediments to be disturbed
20000	or removed from the Project waters and test them for contaminants. Sampling and testing shall be
	accomplished according to a protocol submitted to and approved by the Department prior to sampling.
	Prior to dredging or other excavation, the certificate holder must secure Department approval for
	all disposal or interim holding locations for any sediments to be removed from the Project waters.
11.	Erosion and Sediment Control: The certificate holder shall ensure that the following erosion and
	sediment/contaminant control measures, at a minimum, are adhered to during routine maintenance
	and construction (including maintenance dredging) that may result in sediments/contaminants
	entoring the Project reconvoirs or the Hoosic Piver

DEC PERMIT NUMBER PAGE 4_OF 5_

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		NEW YORK	STATE DEPARTMENT OF ENVI	RONMENTAL CONSER	IVATION	
			SPECIAL COND	TIONS		
	1.	Isolate in-stream work f sediments caused by e of the Hoosic River.	rom the flow of water ar xcavation. dewatering a	nd prevent discolor and construction a	ored (turbid) activities fron	discharges and n entering the waters
	2.	Prohibit heavy constru- reservoirs and the Hoo dewatered	ction equipment from op sic River until the work	erating below the area is protected	e mean high by a waterti	water level of Project ght structure and
	3.	Minimize soil disturban temporary and/or perm the potential for erosio River.	ice, grade so as to preve nanent stabilization of all n and subsequent sedir	ent or minimize e disturbed areas nentation within f	rosion and p and stockpil Project reser	provide les to minimize voirs or the Hoosic
	4.	Protect all waters from solvents, epoxy resins Project.	contamination by delete or other materials used	erious materials s in construction, i	such as wet maintenance	concrete, gasoline e and operation of the
	5.	Install and maintain er eroded material from e must be installed befor control structures must	osion control structures entering Project reservoi ore commencing any act st be maintained in a full	on the down slop rs or the Hoosic tivities involving s y functional cond	bes of all dis River. Erosi soil disturbar lition.	turbed areas to prevent ion control structures nce and all erosion
	6.	Ensure complete remo and banks of Project re	ovat of all dredged/exca eservoirs and the Hoosi	vated material ar c River in the vici	nd constructi inity of the P	on debris from the bed roject.
	7.	Ensure that all tempor removed, immediately Department.	ary fill and other materia upon completion of cor	Is placed in the vistruction, unless	waters of the otherwise d	river are completely irected by the
12.	Placem structur Reserve	ent of cofferdams, consi res which encroach upor pirs: The design of all su	Inuction of temporary ac- the bed or banks of the ch structures must be ap	cess roads or ran Hoosic River or oproved by the D	nps, or othe Project epartment p	r temporary rior to installation.
13	<u>River F</u> continu provisio	<u>low</u> : During any period cously maintain adequate ons of this certificate.	of maintenance and/or co e flows immediately dow	onstruction activi nstream of work	ty, the certifi sites consist	cate holder shall tent with the
14.	Constru- level of refill, th	uction Drawdowns: Whe Project reservoirs be lo e water level of the impo	never construction and/ wered, it shall not be dra bundment shall not be a	or maintenance a awn down more t llowed to rise mo	activities required han 1 foot point foot po	uire that the water er hour. During ot per hour.
15.	<u>Turbidity Monitoring</u> : During maintenance or construction-related activities in or near the Hoosic River or Project reservoirs, the certificate holder will monitor the turbidity of Project waters at a point immediately upstream of the work area and at a point no more than 100 feet downstream from the work area. The certificate holder specifically agrees that if, at any time, turbidity measurements from the downstream locations exceed the measurements from the upstream locations, all related construction on the Project will cease until the source of the turbidity is discovered and the situation is corrected.					
16.	Notifica comme	ations: The Chief Permit encing any Project maint	Administrator must be r enance or construction	notified in writing work performed u	at least two under the au	weeks prior to this certificate.
D.	PUBLI	C ACCESS AND RECR	EATION			
16.	Public	access and recreational	opportunities shall be p	rovided in confor	mance with	the Settlement.
cc:	List Att	ached	· · · · · · · · · · · · · · · · · · ·			
DEC PE 4-384	2-0010	ABER 9/00001			PAGE <u>5</u>	_ OF <u>_5</u>

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Betty Lou Bailey, Chairman Adirondack Mountain Club Canoe Route Subcommittee 4029 Georgetown Square Schenectady, New York 12303-5300

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Neil F. Woodworth, Counsel & Deputy Ex. Director Adirondack Mountain Club 301 Hamilton St Albany, New York 12210-1707

Andrew Fahlund, Director of Hydropower Dev. American Rivers 1025 Vermont Ave NW Washington, DC 20005-3516 John T. Gangemi, Conservation Director American Whitewater 482 Electric Ave Bigfork, Mt. 59911-3641

Town Clerk Town of Cambridge Cobble Road Cambridge, NY 12816 Jacob S. Niziol, Coordinator Reliant Energy 225 Greenfield Parkway, Suite 201 Liverpool, NY 13088-6656

James A. Bessha Fourth Branch Assoc (Mechanicville) 455 New Karner Road Albany, NY 12205-3821 Office of the Mayor Village of Hoosick Falls PO Box 247 Hoosick Falls, NY 12090-0247

Jerry L. Sabattis, Hydro Licensing Coordinator Reliant Energy 225 Greenfield Parkway, Suite 201 Liverpool, NY 13088-6656

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Mitchell F. Hertz, Esquire Kirkland & Ellis 655 15th St NW, Suite 1200 Washington, DC 20005-55701 Samuel S. Hirschey P.E., Manager Reliant Energy Erie Boulevard Hydropower, L.P. 225 Greenfield Parkway, Suite 201 Liverpool, NY 13088-6656

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W, Thaddeus Miller Reliant Energy. 7 E. Redwood St., Floor 10 Baltimore, Md 21202-1115

Frances E. Francis, Esquire Spiegel & Diarmid 1350 New York Ave NW, Suite 1100 Washington, DC 20005-4710 Town Clerk Town of Hoosick 56 Church Street Hoosick Falls, NY 12090-1644

Office of the Mayor Town of Mechanicville 36 North Main Street Mechanicville, NY 12118-1985 David J. Miller National Audubon Society 700 Broadway New York, NY 10003-9536

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Richard Roos-Collins, Director of Litigation Natural Heritage Institute 2140 Shattuck Ave, Floor 5 Berkeley, Ca 94704-1210 Janet Hand Deixler, Commissioner New York Public Service Commission 3 Empire State Plaza Albany, New York 12223-1000

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Bruce .R. Carpenter, Executive Director Rivers United PO Box 1460 Rome, NY 13442-1460 Director New York Sea Grant Institute SUNY Dutchess Hall Stony Brook, NY 11794-0001 .

Carol A. Howland New York State Electric & Gas Corp. PO Box 5224 Binghamton, NY 13902-5224 John J. Gosek, Mayor City of Oswego Office of the Mayor, City Hall 11 West Oneida Street Oswego, NY 13126

Town Clerk Town of Pittstown R.D. #1 Valley Falls, NY 12185 John D. Draghi Law Offices of Huber Lawrence & Abell 605 3rd Ave, Floor 27 New York, NY 10158-2799

Paul V. Nolan 5515 17th Street Arlington, Va 22205-2722 Raymond W. Coonrad Rensselaer County Conservation Alliance 3119 6th Avenue Troy, NY 12180-1202

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Leon F. Szeptycki, Environmental Counsel Trout Unlimited 1500 Wilson Blvd., Suite 310 Arlington, Va 22209-2404

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Office of the Mayor City of Troy 1 Monument Square Troy, New York 12180-0824

Leonard P. Corin, Field Supervisor. U.S. Fish & Wildlife Service 3817 Luker Road Cortland, NY 13045-9385 Kevin Mendick U.S. National Park Service North Atlantic Region 15 State Street Boston, Ma 02109-3502 .

Anthony R. Conte US Dept. of the Interior Suite 300 70 Commercial Street Concord, NH 03301-5031 Thomas Matias Trout Unlimited 37 Douglas Road Delmar, NY 12054-3125

Lydia T. Grimm US Dept. of the Interior Office of the Solicitor 1849 C Street NW, MS 6456 Washington, DC 20240-0001 Office of the Mayor Village of Valley Falls PO Box 157 Valley Falls, NY 12185-0157

Bill Jolly Washington State Parks & Recreation Commission PO Box 42668 Olympia, Wa 98504-2668 Judith M. Stolfo US Dept. of the Interior 1 Gateway Center, Suite 612 Newton, Ma 02458-2881

F. Michael Tucker Mercer Companies Inc Three E-Comm 2 Albany, NY 12207-2981 William J. Madden Jr., Esquire Winston & Strawn 1400 L Street NW Washington, DC 20005-3509

County Clerk County of Washington Washington County Office Building Upper Broadway Fort Edward, NY 12828 John Costello Office of Hydropower Licensing Federal Energy Regulatory Commission 888 First Street, NE Washington, DC 20426 Deborah Osborne Office of Dispute Resolution Federal Energy Regulatory commission 888 First Street, NE Washington, DC 20426

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Thomas DeWitt Office of Hydropower Licensing Federal Energy Regulatory Commission 888 First Street, NE Washington, DC 20426

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Honorable Magalie R. Salas Federal Energy Regulatory Commission 888 First Street, NE Washington, DC 20426

APPENDIX D NYSDEC Water Quality Conditions Confirmation

From: Hogan, Chris M (DEC) <<u>chris.hogan@dec.ny.gov</u>> Sent: Wednesday, August 14, 2019 2:01 PM To: Zehr, Jason <<u>Jason.Zehr@brookfieldrenewable.com</u>> Cc: VanMaaren, Chris C (DEC) <<u>chris.vanmaaren@dec.ny.gov</u>> Subject: Brookfield WQCs

CAUTION: This email originated from outside of the organization. Do not click on links or open attachments unless you recognize content is safe. Please report suspicious emails <u>here</u> **ATTENTION:** Ce courriel provient d'une source externe, ne cliquez pas sur les liens et n'ouvrez pas les pièces jointes, à moins que vous en reconnaissiez la source. Veuillez nous aviser <u>ici</u> de tout courriel suspect.

Jason – Chris VanMaaren forwarded me your email requesting that the NYSDEC confirm that the Section 401 Water Quality Certificates (WQC) for the Brookfield Renewable facilities listed below are still in effect.

Lower Raquette River (P-2330) – WQC effective date of October 2006 Middle Raquette River (P-2320) – WQC effective date of October 2006 School Street (P-2539) – WQC effective date of October 2006 Hoosic River (P-2616) – WQC effective date of September 2002

This email serves to confirm that the WQCs for the above reference facilities were issued to expire concurrent with the FERC license. As such, all of the NYSDEC WQCs are valid and in full effect for these facilities.

If you need anything further from the NYSDEC please contact me.

Christopher M. Hogan Chief, Major Project Management Unit Department of Environmental Conservation Division of Environmental Permits 625 Broadway, 4th Floor Albany, NY 12233-1750 (518) 402-9151 <u>chris.hogan@dec.ny.gov</u>

NOTICE: This communication and any attachments ("this message") may contain information which is privileged, confidential, proprietary or otherwise subject to restricted disclosure under applicable law. This message is for the sole use of the intended recipient(s). Any unauthorized use, disclosure, viewing, copying, alteration, dissemination or distribution of, or reliance on, this message is strictly prohibited. If you have received this message in error, or you are not an authorized or intended recipient, please notify the sender immediately by replying to this message, delete this message and all copies from your e-mail system and destroy any printed copies.

APPENDIX E FISH PASSAGE CORRESPONDANCE

Unofficial	FERC-Generated PDF of 20060817-0101 Received by FERC OSEC 08/14/2006 in Docket#: P-2616-056
9 I	
i i	Original Message From: Mark Woythal <u>[mailto:mswoytha@gw.dec.state.ny.us]</u> Sent: Wednesday, July 26, 2006 6:58 PM To: Kulpa, Sarah Subject: Re: Hoosic River Project (Johnsonville) fish passage plans
	Sarah, If you still have not heard back from anyone from the DEC, I would expect that the trashrack designs would be consistent with past discussions, therefore acceptable. The DEC will defer to the USFWS regarding the design and implementation of the eel ladder. Regarding the fish passage route, my only concern would be the safety of passing fish into the plunge pool. It seems like there would need to be significant modifications to existing concrete/bedrock structures in order to provide safe passage. Thank you, Mark Woythal
¢ ^	<pre>>>> "Kulpa, Sarah" <sarah.kulpa@brookfieldpower.com> 07/14/06 2:14 PM >>> Hi Mark, This email is a follow-up to a voicemail I left you last week. We are in the process of finalizing the trashrack, eel ladder, and downstream fish passage flow plans for the Johnsonville development for submittal to FERC. We have already incorporated USFWS's comments and, now that the 30-day comment period has ended, would like to confirm that the DEC has no additional comments about the plans and designs. Thanks, and have a good weekend. Sarah Kulpa</sarah.kulpa@brookfieldpower.com></pre>

Unofficial FERC-Generated PDF of 20060817-0101 Received by FERC 0SEC 08/14/2006 in Docket#: P-2616-056



United States Department of the Interior



FISH AND WILDLIFE SERVICE 3817 Luker Road Curtiand. NY 13045

June 20, 2006

Mr. David W. Culligan, P.E. Erie Boulevard Hydropower, L.P. 225 Greenfield Parkway, Suite 201 Liverpool, NY 13088

RE: Hoosic River Hydroelectric Project (FERC #2616) Johnsonville Development - Fish Protection Measures

Dear Mr. Culligan:

The U.S. Fish and Wildlife Service (Service) has reviewed the June 12, 2006, correspondence providing design drawings for the downstream fish movement and upstream cel conveyance structures for the Johnsonville development of the Hoosic River Project. We have the following comments on these designs.

Downstream Fish Passage

The drawings for the 1" clear spaced trashracks have been previously reviewed and found to be adequate. We have a concern with the gate, however. Having the gate centered within a larger gate is expected to spread the flow out to the maximum amount as it passes down the existing chute. There is concern that the flow might be too shallow and have a high velocity at the end of the chute. Erie should investigate whether the flow would maintain a higher depth if the fish passage gate were placed on the right side wall (looking downstream).

Upstream Eel Passage

Operating Flows and Supplemental Attraction Water

There does not appear to be any additional attraction water supplied adjacent to the entrance. Approximately 120 gallons per minute (gpm) should be supplied as attraction water at the base of the ramp. A total of 20 gpm is recommended for operating flow via the spray bar at the top of the eel ramp (10 gpm down the ramp and 10 gpm down the eel slide or discharge chute).

Entrance Location and Orientation

Field inspections demonstrated that spillway leakage follows a conveyance channel immediately at the toe of the spillway. It is unknown whether the eels will be able to find the entrance that appears to be about 6 feet downstream from the base of the spillway. The field adjustments will have to connect the entrance to the conveyance flow channel. Unofficial FERC-Generated PDF of 20060817-0101 Received by FERC OSEC 08/14/2006 in Docket#: P-2616-056

Media Alternatives

Some of the coastal eel passes are now using a mixed media with half enkamat liner and half akwadrain media that has a semi-tubular element for the slightly larger eels.

Eel Counting

Some method of counting cels passing into the headpond would be desirable. A proprietary cel counter produced by Milieu of Quebec is being used at the St. Lawrence-FDR Power Project in Massena, New York. A similar counter has been recommended by the Service for Erie's Oswego River eel ladders. Other alternatives may also be available.

Discharge Chute

A discharge chute that is long enough to include a counting mechanism is needed. If an interim capture tank is considered for evaluation purposes, the exit end will need to be compatible with the hoistable holding tank.

Access

Access for personnel to clean and service the fishway is needed. It is unclear how the manual PVC shut-off valve on the supply to the gravity hydroarm pump will be accessed for operation.

Covering the Eelpass

Hinged covers over permanent eel ramps are recommended to minimize predation, eel escape, and trash entering, and to provide darkened areas not affected by powerhouse yard or nearby street lighting.

The Service appreciates the opportunity to provide comments on the fish passage structures. For questions related to the technical designs, please contact Curt Orvis at 413-253-8288. If you have any questions or need additional information, contact Steve Patch at 607-753-9334.

Sincerely,

David A. Stilwell **Field Supervisor**

cc: NYSDEC, Albany, NY (M. Woythal) FWS, Hadley, MA (C. Orvis)

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APPENDIX F THREATENED AND ENDANGERED SPECIES CORRESPONDANCE



ORIGINAL United States Department of the Interior

FISH AND WILDLIFE SERVICE 3817 LUKER ROAD CORTLAND, NY 13045

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REGULATORY COMMISSION

March 10, 2000

Mr. R. Feller Chief, Lands Resources Section Licensing East Branch Federal Energy Regulatory Commission 888 First Street, NE Washington, D.C. 20426

P-2616-004

Dear Mr. Feller:

This responds to your letter of February 4, 2000, requesting information on the presence of Federally listed or proposed endangered or threatened species in the vicinity of the Hoosic River Hydroelectric Project consisting of two developments, Johnsonville and Schaghticoke, in the Towns of Schaghticoke and Pittstown, Rensselaer County, New York (FERC Number 2616-004).

The bald eagle (Haliaeetus leucocephalus) is a Federally listed threatened species known to occur in the vicinity of the proposed project. The project's environmental documents should, therefore, include an evaluation of the potential direct, indirect, and cumulative effects of specific project related activities on the bald eagle or its habitat, and include appropriate measures, if necessary, to protect this species and its habitat. When specific plans are identified, the plans and the results of the evaluations should be provided to this office to determine the need for further consultation pursuant to Section 7 of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Except for the bald eagle, and occasional transient individuals, no other Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact areas. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered. A compilation of Federally listed and proposed endangered and threatened species in New York is enclosed for your information.

The above comments pertaining to endangered species under our jurisdiction are provided pursuant to the Endangered Species Act. This response does not preclude additional Service comments under the Fish and Wildlife Coordination Act or other legislation.

The bald eagle is also listed as endangered by the New York State Department of Environmental Conservation (State). Any project plans and/or evaluation results should be coordinated with both this office and with the State. The State contact for the bald eagle is Mr. Peter Nye,

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Endangered Species Unit, Wildlife Resources Center, Delmar, NY 12054-9767 (telephone: (518) 439-7635).

For additional information on fish and wildlife resources or State-listed species, we suggest you contact:

New York State Department of Environmental Conservation Region 4 1150 N. Westcott Road Schenectady, NY 12306 (518) 357-2066

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New York State Department of Environmental Conservation Wildlife Resources Center - Information Services New York Natural Heritage Program 700 Troy-Schenectady Road Latham, NY 12110-2400 (518) 783-3932

National Wetlands Inventory (NWI) maps may or may not be available for the respective project areas. However, while the NWI maps are reasonably accurate, they should not be used in lieu of field surveys for determining the presence of wetlands or delineating wetland boundaries for Federal regulatory purposes. Copies of specific NWI maps can be obtained from:

Cornell Institute for Resource Information Systems 302 Rice Hall Cornell University Ithaca, NY 14853 (607) 255-4864

Work in certain waters and wetlands of the United States may require a permit from the U.S. Army Corps of Engineers (Corps). If a permit is required, in reviewing the application pursuant to the Fish and Wildlife Coordination Act, the Service may concur, with or without stipulations, or recommend denial of the permit depending upon the potential adverse impacts on fish and wildlife resources associated with project implementation. The need for a Corps permit may be determined by contacting Mr. Joseph Seebode, Chief, Regulatory Branch, U.S. Army Corps of Engineers, 26 Federal Plaza, New York, NY 10278 (telephone: [212] 264-3996).

If you require additional information please contact Michael Stoll at (607) 753-9334.

Sincerely, Mark W. Clough

ACTING FOR David A. Stilwell Field Supervisor

Enclosure

cc: NYSDEC, Schenectady, NY (Environmental Permits) NYSDEC, Latham, NY COE, New York, NY

FEDERALLY LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES IN NEW YORK

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Common Name	Scientific Name	Status	Distribution
FISHES			
Sturgeon, shortnose*	Acipenser brevirostrum	E	Hudson River & other Atlantic
REPTUES			coastal rivers
Turtle, bog	Clemmys muhlenbergii	Т	Albany, Columbia, Dutchess, Genesee, Orange, Oswego, Putnam, Seneca, Ulster, Wayne, and Westchester Counties
Turtle, green*	Chelonia mydas	Т	Oceanic summer visitor coastal waters
Turtle, hawksbill*	Eretmochelys imbricata	Е	Oceanic summer visitor coastal waters
Turtle, leatherback*	Dermochelys coriacea	Е	Oceanic summer resident coastal
Turtle, loggerhead*	Caretta caretta	Т	Oceanic summer resident coastal
Turtle, Atlantic ridley*	Lepidochelys kempii	Ε	Oceanic summer resident coastal waters
BIRDS			
Eagle, bald	Haliaeetus leucocenhalus	т	Entire state
Ployer nining	Charadrius melodus	Ê	Great Laker Watershad
rie en, piping	endi dai nas metodas	Ť	Demainder of constal New York
Tern, roseate	Sterna dougallii dougallii	Ê	Southeastern coastal portions of state
MAMMAIS			
Bat Indiana	Muotis sodalis	F	Entire state
Cougar eastern	Falis concolor couquer	E	Entire state
Whale blue*	Palaemontana musulus	E	Entire state - probably extinct
Whole Sabash*	Balaenopiera musculus	E	Oceanic
Whale, human ask	Balaenopiera physalus	E	Oceanic
Whale minboack*	Megaptera novaeangliae	E	Oceanic
whale, right*	Eubalaena glacialis	E	Oceanic
whale, sei*	Balaenoptera borealis	E	Oceanic
whale, sperm*	Physeter catodon	E	Oceanic
MOLLUSKS			
Snail, Chittenango ovate amber	Succinea chittenangoensis	Т	Madison County
Mussel, dwarf wedge	Alasmidonta heterodon	Е	Orange County - lower Neversink River
BUTTERFLIES Butterfly, Karner blue	Lycaeides melissa samuelis	Е	Albany, Saratoga, Warren, and Schenectady Counties

* Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service.

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FEDERALLY LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES IN NEW YORK (Cont'd)

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Common Name	Scientific Name	Status	Distribution
PLANTS			
Monkshood, northern wild	Aconitum noveboracense	Т	Ulster, Sullivan, and Delaware Counties
Pogonia, small whorled	Isotria medeoloides	Т	Entire state
Swamp pink	Helonias bullata	Т	Staten Island - presumed extirpated
Gerardia, sandplain	Agalinis acuta	E	Nassau and Suffolk Counties
Fern, American hart's-tongue	Asplenium scolopendrium var. americana	Т	Onondaga and Madison Counties
Orchid, eastern prairie fringed	Platanthera leucophea	Т	Not relocated in New York
Bulrush, northeastern	Scirpus ancistrochaetus	E	Not relocated in New York
Roseroot, Leedy's	Sedum integrifolium ssp. Leedvi	Т	West shore of Seneca Lake
Amaranth, seabeach	Amaranthus pumilus	Т	Atlantic coastal plain beaches
Goldenrod, Houghton's	Solidago houghtonii	Τ	Genesee County

E=endangered T=threatened P=proposed

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External

New York Natural Heritage has received your email. If you have submitted a request for a project screening, please expect a response within 4-6 weeks.

Sincerely,

Information Services Team

New York Natural Heritage Program 625 Broadway, 5th Floor Albany, NY 12233-4757

phone: (518) 402-8935 fax: (518) 402-8925 e-mail: <u>NaturalHeritage@dec.ny.gov</u> www.nynhp.org

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