STATE OF CONNECTICUT
PUBLIC UTILITIES REGULATORY AUTHORITY

Application for a Class I or Class II Renewable Energy Source Certification

To apply for certification as a Class I or Class II renewable energy source, the generation facility **must be currently operating and must be registered** with either the Independent System Operator of New England (ISO-NE) or the New England Power Pool Generation Information System (NEPOOL GIS**). Note: When registering a solar or fuel cell facility with NEPOOL GIS, use the complete address as the Facility Name. For example, 312 Main Street, Apt. C, New Britain, CT.**

Please Note:

- Regarding Filing Instructions, **an *electronic* copy** of the Application must be submitted via the Public Utility Regulatory Authority's (Authority) Web Filing System. To file an Application electronically, visit the Authority's website at www.ct.gov/pura. Under the Docket Services Section, click the link 'Make a Web Filing' and then click the link 'Docket Database Web Filing System'. Follow steps 1 through 3 on this page to complete the filing process. If you already have obtained a Web Filing Account proceed directly to the link 'File a New Docket Application' under Step 3. (All attachments should be clearly identified).

- All information submitted on, or attached to, the application is a public record in accordance with The Freedom of Information Act, the General Statutes of Connecticut § 1-210, except for any confidential materials filed under protective order.

- Applicants are responsible for promptly notifying the Authority of any future changes pertaining to the information contained within this application.

- **Keep a copy** of the application for your records.

- Regarding any **questions, contact Donna Devino** via email at donna.devino@ct.gov or directly at 860-827-2873.

Part I: Type of Certification

Check one: ☒ **New Certification** (Complete entire application) ☐ ***Amendment to Certification** (Complete entire application)	**If an Amendment**, provide original Docket Number: **Docket No:** _____
*The Owner/Authorized Representative must also inform the NEPOOL GIS (www.nepoolgis.com) of any **Amendments**. Regarding an **Amendment**, describe exactly what has changed: _____	
Re: LREC, ZREC, RSIP-E, SHREC, SCEF, RRES or Non-RRES Program: Is the Generation Facility in the LREC/ZREC, RSIP-E, SHREC, SCEF, RRES or Non-RRES Program? ☐ Yes ☒ No If yes, which program? ☐ LREC ☐ ZREC ☐ RSIP-E ☐ SHREC ☐ SCEF ☐ RRES ☐ Non-RRES If yes, for **which** service territory ? ☐ CL&P (Eversource) ☐ UI **Re: LREC/ZREC Program**: ☐ If CL&P (Eversource) - **Scan and Attach** pp. 1 – 3***** from Attachment 1: "Service Agreement" - **Scan and Attach** the "Approval to Energize" Letter ☐ If UI - **Scan and Attach** pp. 1 - 3***** from the "Standard Contract" ***NOTE:** Redact financial info. - **Scan and Attach** the "Generator Approval" Letter	

Part II: Generation Facility Information

1. Generation Facility

Name of Facility: Sheldon Springs

(For solar or fuel cell facilities only - The "Name" must be the complete address of the Generation Facility. For example: "16 Main St., Apt. C, New Britain, CT." Also, the "Name" must be the same name that was registered with the NEPOOL GIS or ISO New England.

Location **(Complete address with number)** of Facility: 121 Heather Lane

City/Town: Sheldon Springs State: VT Zip Code: 05485

Check one: ☐ **Residential Location** ☐ **Commercial Location** ■ **Industrial Location**

Has a different source (solar, fuel cell, etc.) been approved at this address in the past? ☐ Yes ☐ No

If yes, which source (s): Sheldon Solar (not owned by Patriot Hydro)

Scan and attach evidence of the existence of the property address and evidence of the ownership of the property (i.e., print screen of city/town assessment record).
Provide a picture of the following: (a) the generation facility, (b) the meter and (c) the generation facility in proximity to the property.

2. Owner of Generation Facility (The Generation Facility is defined as the renewable energy source)

Name: Missisquoi,LLC contact: John Robichaud

(If company name, must also provide a contact name)

Mailing Address: 670 N. Commercial St. Suite 204

City/Town: Manchester State: NH Zip Code: 03101

Business Phone: 603-623-8222 Email: jrobichaud@patriothydro.com

3. Does the Owner of the Generation Facility own the land and the building on which the Generation Facility is located? ■ **Yes** ☐ **No** **If no, must complete No. 4 below.**

Scan and attach documentation demonstrating ownership (i.e., town assessment record or tax bill).

4. Property Owner of Location of Generation Facility [complete only if "No" is checked in No. 3 above]

Name: _____

(If company name, must also provide a contact name)

Mailing Address: _____

City/Town: _____ State: _____ Zip Code: _____

Business Phone: _____ Email: _____

Scan and attach documentation demonstrating ownership (i.e., town assessment record or tax bill).

Scan and attach a document that was signed by the Property Owner, showing that the Property Owner: (a) authorized the installation of a renewable energy source on his/her property and (b) acknowledges that the person/company listed in No. 5 will be receiving the RECs (if company, signature must be from a member or official listed in the documentation).

(To satisfy this request, the Property Owner can complete and sign the Affidavit in Part VI – If Owner is a Company, provide a print screen of the Secretary of State's business record or other business registration showing names of officers or members of the business).

5. Person or Company that will receive the Renewable Energy Credits (RECs)

Name: Patriot Hydro, LLC contact: Torie Massero

(If company name, must also provide a contact name)

Mailing Address: One Tower Center Blvd.

City/Town: East Brunswick State: NJ Zip Code: 08816

Business Phone: 603-300-6621 Email: tmassero@patriothydro.com

Part II: Generation Facility Information (continued)

6. Nameplate/Installed Capacity (in megawatts per AC): 22.30

If in SHREC Program, also provide Nameplate/Installed Capacity (in megawatts per DC): _____

7. Commercial Operation Date: 1988
(If in the LREC/ZREC Program, date must match date on "Approval" Letter)

8. Generation Facility is:

☒ Grid-connected – provide the ISO-NE Generation Unit Asset ID No. (MSS#): 565

☐ Behind-the-meter – provide the NEPOOL GIS ID No. (NON#): _____

NOTE: visit www.nepoolgis.com and click on the blue "Register" button located under the "Registry Login" area. Complete only the required fields on the first page of the generator form and click the submit button at the bottom of the second page. The second page denotes RPS eligibilities and the NEPOOL GIS will update that field after the facility has been approved. When you return to your home page, you will see your newly registered generator, with a corresponding Unit ID number that begins with "NON" followed by a series of numbers.

9. Third Party Verifier (Complete only if Generation Facility is out-of-state and behind-the-meter)

Name: _____

Mailing Address: _____

City/Town: _____ State: _____ Zip Code: _____

Business Phone: _____

*Email: _____

If Verifier has been approved by the Authority, provide the Docket No.: _____

If Verifier has not been approved by the Authority, provide the following: (1) Verifier's resume and (2) a statement describing the affiliation between the Verifier and the Generation Facility, Generation Facility's Owner and the Generation Facility's Authorized Representative.

Part III: Class I or Class II Renewable Energy Source

Class I - Check Generation Facility's fuel source(s).	**Required Documentation:**
☐ Solar Power	None
☐ Wind Power	None
☐ A Fuel Cell	None
☐ Geothermal	None
☐ Landfill Methane Gas, Anaerobic Digestion or other Biogas Derived from Biological Sources	1. What type of methane gas is used? (check the applicable box below) ☐ landfill produced methane gas ☐ anaerobic digester produced methane gas ☐ other biogas derived from biological sources 2. Attach a detailed description of the process used to produce methane gas. 3. Is the generation unit located in the jurisdiction of ISO New England or jurisdictions able to import into the control area of ISO New England and pursuant to the NEPOOL GIS? ☐ Yes ☐ No 4. Is the generation unit located on-site where the methane gas is produced? ☐ Yes ☐ No 5. If the generation unit is not located on-site (Injected Methane Gas): a. Is the methane gas gathered, processed, and injected into a common carrier pipeline? ☐ Yes ☐ No b. Is the methane gas delivered and withdrawn from the pipeline in a manner and timing consistent with the transport of fuel between the injection and withdrawal points? ☐ Yes ☐ No

Part III: Class I or Class II Renewable Energy Source (continued)

Class I - Check Generation Facility's fuel source(s).	**Required Documentation:**
	c. Does the generator have a contracted transportation path between the methane gas injection point and the gas withdrawal point? ☐ Yes ☐ No d. Have the fuel and its renewable attributes been uniquely sold to and used by the generators? ☐ Yes ☐ No e. Has the non-renewable fuel, or electricity consumed for the purpose of purifying, conditioning or transporting the LMG, been considered as an offset to the total fuel delivered to the generator? ☐ Yes ☐ No f. Is the Landfill located in the jurisdiction of ISO New England or jurisdictions able to import into the control area of ISO New England and pursuant to the NEPOOL GIS? ☐ Yes ☐ No
☐ Thermal Electric Direct Energy Conversion	Attach a detailed description.
☐ Ocean Thermal Power	Attach a detailed description.
☐ Wave or Tidal Power	Attach a detailed description.
☐ Low Emission Advanced Renewable Energy Conversion Technologies	Attach a detailed description.
■ A Run-of-the-River Hydropower Facility **Statutory Requirements:** *Began operation after July 1, 2003; *A generating capacity of not more than thirty megawatts; *Is not based on a new dam or a dam identified as a candidate for removal; and *Meets applicable state and federal requirements.	Attach a copy of the state and federal letters confirming that the facility is not based on a new dam or a dam identified as a candidate for removal. Attach a copy of the state and federal letters confirming that the facility meets all applicable requirements, including applicable site-specific standards for water quality and fish passage. Attach a copy of the current FERC License, or exemption from FERC, requiring that the facility be operated in run-of-the-river mode. a. Provide page number demonstrating when facility first began operation: 1 b. Provide page number demonstrating that facility is required to operate in a run-of-the-river mode: 9 Attach a copy of 12-months of data demonstrating that the river inflow equals its outflow and river fluctuation levels.

Part III: Class I or Class II Renewable Energy Source (continued)

Class I - Check Generation Facility's fuel source(s).	**Required Documentation:**
☐ Biomass Facility **Statutory Requirements:** *Uses sustainable biomass fuel that is "cultivated and harvested in a sustainable manner; *Has an average emission rate of equal to or less than .075 pounds of nitrogen oxides per million BTU of heat input for the previous calendar quarter, or *Has a capacity of less than five hundred kilowatts that began construction before July 1, 2003.	Attach a copy of most recent fuel plan, as filed with the state agency. Provide the facility's average emission rate per quarter: _____ Attach a copy of the facility's valid Air Permit or equivalent authorization indicating nitrogen oxides (NOx) emissions and provide page number demonstrating NOx emissions: _____ Regarding the biomass used by the facility, list each type, as well as the percentage used: _____ Did the facility receive funding from the Clean Energy Fund, established pursuant to General Statutes § 16-245n , prior to May 1, 2006? ☐ Yes ☐ No Is the energy derived from the facility subject to a long-term power purchase contract pursuant to subdivision (2) of subjection (j) of General Statutes § 16-244c entered into prior to May 1, 2006? ☐ Yes ☐ No Attach an explanation.
Class II - Check Generation Facility's fuel source(s).	**Required Documentation:**
☐ Trash to Energy **Statutory Requirements:** ***Must have a CT permit**	Attach a detailed description of the facility, as well as the trash used. Attach a copy of the CT permit.

Part IV: Generation Facility Owner Certification

The Generation Facility Owner (Page 2, Part II, No. 2) **must sign this Certification. An application shall be considered incomplete unless a signature is provided.**

I hereby certify, under pains and penalty of perjury, that I have personally examined and am familiar with the information submitted herein and based upon my inquiry of those individuals immediately responsible for obtaining the information, believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties, both civil and criminal, for submitting false information, including possible fines and punishment. My signature below certifies all of the information submitted on this Renewable Energy Source Certification Application. I acknowledge that the Public Utilities Regulatory Authority (Authority) shall be promptly notified in the event of a change in its eligibility status (including, without limitation, the status of the air permits). If, in the Authority's opinion after due consideration, there is a material change in the characteristics of the Generation Facility or its fuel stream that could alter eligibility, an Amendment to Registration shall be submitted to the Authority. I further acknowledge that all required reports shall be maintained at the Generation Facility. I understand that the Generation Facility shall be immediately de-registered if it fails to retain such reports.

The Generation Facility meets the mandated requirements as a Class I or Class II renewable energy source as specified in this application, and shall abide by all mandated requirements, pursuant to §§ 16-1(a)(26),(27), or (45) of the General Statutes of Connecticut (Conn. Gen. Stat.).

I understand that a false statement regarding the submitted information, depending on the circumstances, may disqualify the Generation Facility and the owner/authorized representative may be subject to penalties. Additionally, the owner/authorized representative shall not in any circumstance be able to file future Connecticut Renewable Portfolio Standard Applications in the State of Connecticut. I also understand that the Generation Facility is subject to audit (physical and/or verbal) by the Authority or an entity hired by the Authority regarding generation output and renewable energy certificates (RECs).

Johnathan Robichaud	10/30/2026
Signature of Generation Facility Owner	Date
Print Name of Generation Facility Owner John Robichaud	Title (if applicable) Asset Manager

Part V: Generation Facility Owner Certification of Authorized Representative

Complete only if the Generation Facility Owner designates another person to act on his/her behalf.

"I, as Owner of the Generation Facility and under the pains and penalties of perjury, hereby certify that the person listed below is authorized to act on behalf of the generation facility in (a) executing this application for a Class I or Class II Renewable Energy Source Certification and (2) complying with all orders issued by PURA concerning the Certification. I understand that the Authorized Representative will be designated as the recipient of all correspondence relating to this Generation Facility, and that the Generation Facility's Certification may be revoked if the Authorized Representative fails to comply with PURA orders:

Authorized Representative:

Name: _____
(If company name, must also provide a **contact name**)

Mailing Address: _____

City/Town: _____ State: _____ Zip Code: _____

Business Phone: _____

Email: _____

_____
Signature of Generation Facility Owner Date

Print Name of Generation Facility Owner Title (if applicable)

Part VI: Property Owner Acknowledgement and Consent

Complete only if needed to satisfy the requirement on Page 2, Part II, No. 4.

The Property Owner of the Location of the Generation Facility is defined as the legal owner of the building or property on which the renewable energy source is located. The Property Owner of the Location of the Generation Facility includes: (A) the homeowner, if the renewable energy source is located on a residential property; (B) the landlord, if the renewable energy source is located on a rental property; and (C) the property owner, if the renewable energy source is located on/in a commercial property or building. The Property Owner of the Location of the Generation Facility may or may not be the Applicant. Authorized Representatives are allowed only for commercial buildings or properties where the Property Owner of the Location of the Generation Facility is a registered commercial entity, such as CORP, LLC, LLP, LP or statutory trust. Homeowners may not use Authorized Representatives.

"As ☐ Property Owner of the Location of the Generation Facility or ☐ a duly authorized representative of the Property Owner of the Location of the Generation Facility, I hereby attest that I have reviewed the statements and certifications of the Applicant provided above and certify that:

1. I have given full consent and authorization to _____ (name) to install a renewable energy source using _____ (name of energy source) power on my property located at _____ (full address);

2. I am aware and acknowledge that _____is applying to qualify for certification as a Connecticut ☐ Class I or ☐ Class II renewable energy source, pursuant to § 16-1 of the Connecticut General Statutes; and

3. I am aware and acknowledge that _____will receive Renewable Energy Certificates (RECs) generated by this renewable energy source and that such RECs have monetary value and may be used for compliance with the Connecticut Renewable Portfolio Standards, pursuant to § 16-245a of the Connecticut General Statutes."

Property Owner of the Location of the Generation Facility – Please fill out and sign the following:

Property Owner of the Location of the Generation Facility: _____
(Exact legal name of Property Owner, as defined above)

Signature of Property Owner of the Location of the Generation Facility (or Authorized Representative):

_____ **NOTE: Electronic signatures are not acceptable.**

Print or Type Name: _____ _____
(duly authorized)

Title: _____

Date Signed: _____

Attachment 1

Documentation demonstrating ownership

LS Power
PATRIOT HYDRO

October 24, 2025

Town of Sheldon
1640 Main Street
Sheldon, VT 05483

RE: Central Rivers Power (Missisquoi, LLC)
2025 Property Taxes

Please find attached check [redacted] from Patriot Hydro Funding, LLC (the "Company") in the amount of [redacted] payable to Town of Sheldon (the "Collector's Office") to be applied as follows:

- [redacted] – [redacted]
- [redacted]

If you have any questions, please feel free to contact me at (732) 867-5914 or via email at freynoso@lspower.com.

Sincerely,
Fernando Reynoso
Sr. Property Tax Manager

PATRIOT HYDRO FUNDING, LLC

[redacted]-Town Of Sheldon

Print As: Town Of Sheldon

1640 Main St
Sheldon, VT 05483

[redacted]

Citibank, N.A.

PH Fundi[redacted]

OUR REF. NO.	YOUR INVOICE NO.	INVOICE DATE	INVOICE AMOUNT	AMOUNT PAID	DISCOUNT TAKEN	[redacted]UNT
Date	Bill no		Reference Number		Amount Due	Amount Paid/Applied
08/13/2025	[redacted]		[redacted]		[redacted]	
08/13/2025						
Net Amount:						

Page 1 of 1

HOLD TO LIGHT TO VIEW TRUE WATERMARK IN PAPER. HEAT SENSITIVE RED LOCK DISAPPEARS WHEN HEATED.

[redacted]

CITIBANK, N.A.
CITI PRIVATE BANK
[redacted]

Missisquoi Assoc Hydro
c/o **PATRIOT HYDRO FUNDING, LLC**
1 TOWER CENTER 21ST FL
EAST BRUNSWICK, NJ 08816

CHECK DATE	CONTROL NUMBER	AMOUNT
10/22/2025		*[redacted]

Town Of Sheldon

[redacted] Dollars and [redacted] Cents*

PAY

TO THE ORDER OF

Town Of Sheldon
1640 Main St
Sheldon, VT 05483
United States

2025

[redacted]

AUTHORIZED SIGNATURE

Security features. Details on back.

[redacted]

PAYABLE TO:
MAIL TO:

Town of Sheldon

1640 Main St
Sheldon, Vermont 05483

(802) 933-2524

TAX BILL

This is the only bill you will receive. Please forward to new owner if property sold.

PARCEL ID	BILL DATE	TAX YEAR
HRL-01121.	08/13/2025	2025

Taxes unpaid after the due date are delinquent. Maximum interest as allowable by law will be charge in addition to collectors fee of 8%.

Description: 69.5 AC & HYDRO PLANT
Location: 1121 HEATHER LN

OWNER MISSISQUOI ASSOC HYDRO
C/O PETER J CROSSETT
BARCLAY DAMON LLP
125 EAST JEFFERSON STREET
SYRACUSE NY 13202

SPAN # 585-184-10548 SCL CODE: [redacted]
TOTAL PARCEL ACRES [redacted]

FOR INCOME TAX PURPOSES

ASSESSED VALUE		NONHOMESTEAD
REAL	[redacted]	[redacted]
TOTAL TAXABLE VALUE	[redacted]	[redacted]
GRAND LIST VALUES		

MUNICIPAL TAXES				EDUCATION TAXES			
TAX RATE NAME	TAX RATE	x GRAND LIST =	TAXES	TAX RATE NAME	TAX RATE	x GRAND LIST =	TAXES
Municipal Local Agreement	[redacted]			NON HOMESTEAD EDUCATION	[redacted]		

Payments		
1	11/17/2025	[redacted]

TOTAL EDUCATION TAX [redacted]
EDUCATION STATE PAYMENT
EDUCATION NET TAX DUE

TAX SUMMARY
Municipal + Education

TOTAL MUNICIPAL TAX [redacted]
MUNICIPAL STATE PAYMENT
MUNICIPAL NET TAX DUE

TOTAL TAX
TOTAL STATE PAYMENT
TOTAL NET TAX DUE [redacted]

DETACH THE STUB BELOW AND RETURN WITH YOUR PAYMENT

Town of Sheldon

PAYMENT DUE	TAX YEAR
11/17/2025	2025
OWNER NAME	
MISSISQUOI ASSOC HYDRO	
PARCEL ID	
HRL-01121.	
AMOUNT DUE	[redacted]
AMOUNT PAID	

Property taxes are due in full November 17, 2025. Payment must be in the hands of the Town Clerk by 3pm.

PAYABLE TO:
MAIL TO:

Town of Sheldon

1640 Main St
Sheldon, Vermont 05483

(802) 933-2524

TAX BILL

This is the only bill you will receive. Please forward to new owner if property sold.

PARCEL ID	BILL DATE	TAX YEAR
PPT-00653.	08/13/2025	2025

Taxes unpaid after the due date are delinquent. Maximum interest as allowable by law will be charge in addition to collectors fee of 8%.

Description: HYDRO PLANT
Location: 1121 HEATHER LN

SPAN [redacted] SCL CODE: [redacted]

OWNER MISSISQUOI LLC
BARCLAY DAMON
BARCLAY DAMON TOWER
SYRACUSE NY 13202

FOR INCOME TAX PURPOSES

ASSESSED VALUE		
PERSONAL PROPERTY [redacted]		
TOTAL TAXABLE VALUE [redacted]		
GRAND LIST VALUES		

MUNICIPAL TAXES				EDUCATION TAXES			
TAX RATE NAME	TAX RATE	x GRAND LIST =	TAXES	TAX RATE NAME	TAX RATE	x GRAND LIST =	TAXES
Municipal	[redacted]						
Local Agreement							

Payments

1	11/17/2025	[redacted]

EDUCATION STATE PAYMENT [redacted]

TAX SUMMARY
Municipal + Education

TOTAL MUNICIPAL TAX [redacted]
MUNICIPAL STATE PAYMENT
MUNICIPAL NET TAX DUE

TOTAL TAX
TOTAL STATE PAYMENT
TOTAL NET TAX DUE [redacted]

DETACH THE STUB BELOW AND RETURN WITH YOUR PAYMENT

Town of Sheldon

PAYMENT DUE	TAX YEAR
11/17/2025	2025

OWNER NAME
MISSISQUOI LLC

PARCEL ID
PPT-00653.

AMOUNT DUE [redacted]

AMOUNT PAID

Property taxes are due in full November 17, 2025. Payment must be in the hands of the Town Clerk by 3pm.

Attachment 2

Pictures of the following: (a) the generation facility, (b) the meter and (c) the generation facility in proximity to the property.


VOLTS IN/OUT
MIX-N-MATCH


VOLTS IN/OUT


Electro Industries/GaugeTech
NY USA www.electroind.com
Covered by one or more of the following US patents:
7609719, 7305310, 7660682, 6636030, 7616656, 6751563
Model: NEXUS 1262-A-9S-20-60-S-INP200
Serial#: 132-0127448834
Memory: 2 Meg
Class: 20
Freq.: 60 Hz
KYZ Out: YES
Opt. Comm: 10/100 BaseT Ethernet
Power Supply: Std. 102-550V AC


Nexus 1262
Test Pulse
PERFORMANCE ENHANCED
Program
Mult by
VTR
CTR
PKh
002 kWh
Received
624044152
CL20
120-480V
4W
TA 2.5
Kt 1.8
FM 9S
TV 120
Kh 1.8
CA 0.2
Electro Industries GaugeTech
VEC SEALED
DO NOT REMOVE
WARNING



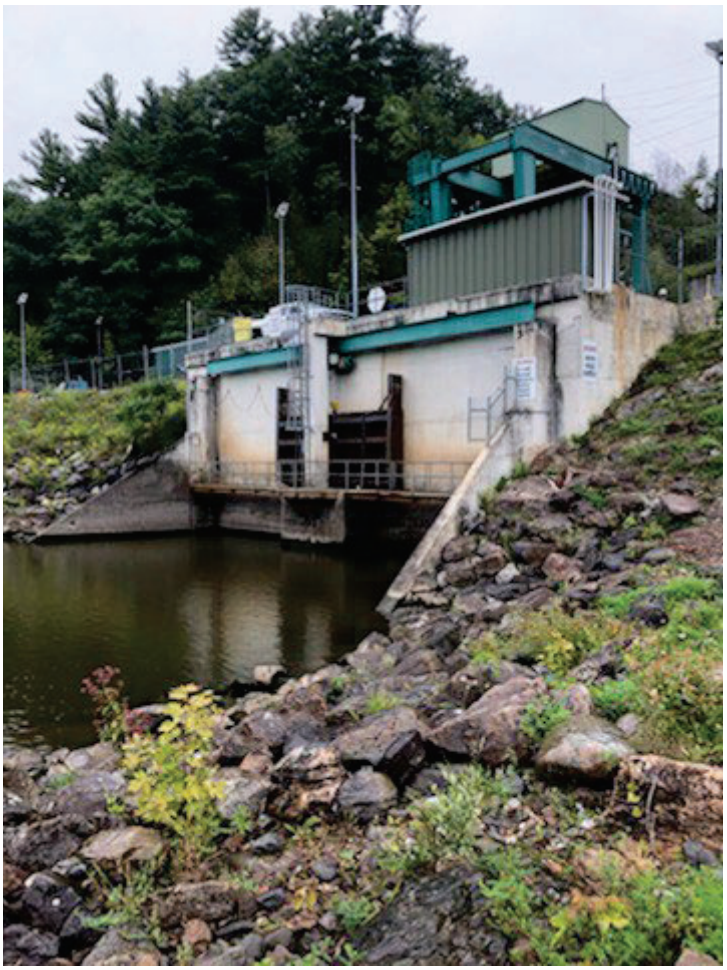
Intake



Main Plant Switch Yard



Tail Race



Attachment 3

2026 Vermont Water Quality Certification: Confirms the facility is required to operate in run-of-river mode and that fish passage facilities are not required.

VERMONT AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DRAFT Water Quality Certification
(33 U.S.C. § 1341)

In the matter of: Sheldon Springs Hydroelectric Project
Missisquoi, LLC
Subsidiary of Patriot Hydro, LLC
670 N. Commercial Street Suite 204
Manchester, NH 03101

APPLICATION FOR SHELDON SPRINGS HYDROELECTRIC PROJECT

Section 401 of the federal Clean Water Act requires that any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates that any such discharge will comply with other substantive provisions of the Clean Water Act. 33 U.S.C. § 1341(a)(1). The certifying State may set forth any effluent limitations and other limitations, and monitoring requirements necessary to ensure that any applicant for a federal license or permit will comply with the Clean Water Act and with any other appropriate requirement of State law. 33 U.S.C. § 1341(d). In Vermont, the Agency of Natural Resources is the certifying agency of the State for purposes of Section 401 of the Clean Water Act. 10 V.S.A. § 1004. The Secretary of Natural Resources has delegated the authority to make certification determinations to the Department of Environmental Conservation (the Department).

The Department has reviewed a water quality certification application dated April 2, 2025, and filed by Missisquoi, LLC. (the Applicant) for the Sheldon Springs Hydroelectric Project (the Project). The supporting documentation for the certification application includes the Applicant's Federal Energy Regulatory Commission (FERC) final license application (FERC No. 7186) dated September 30, 2022, and the Applicant's additional information including decommissioning plans, FERC Environmental Assessment dated February 3, 2026, and other supporting documents filed by the Applicant in support of the application. An Environmental Impact Statement for the Project to be conducted by FERC has yet to be completed.

The current application is subject to review under the Vermont Water Quality Standards promulgated by the Vermont Agency of Natural Resources (the Agency) and effective November 15, 2022 (Environmental Protection Rule, Chapter 29A) (Standards). (Standards, Section 29A-101 Applicability).

The Department will held a public hearing on March 16, 2026, at 11:00 AM at the Sheldon Sprigs town offices located at 1640 Main Street, Sheldon Springs Vermont, to receive oral comments. The Department also accepted written or voicemail comments through 4:30 PM on March 30, 2026. Additional information on the decision, application, and any pertinent updates can be found at the Vermont Agency of Natural Resources Environmental Notice Bulletin Board

(https://enb.vermont.gov/), by searching for the Project name.

The Department, based on the application and record before it, makes the following findings and conclusions.

I. Applicable Statutes and Regulations

A. Applicable Provisions of the Vermont Water Quality Standards

1. The applicable 2022 Vermont Water Quality Standards (Standards) were adopted by the Secretary of the Agency of Natural Resources pursuant to 10 V.S.A., Chapter 47, Water Pollution Control. Title 10, Section 1252 of Chapter 47 provides for the classification of designated uses as either Class A(1), A(2), B(1) or B(2) and authorizes the adoption of standards of water quality to achieve the purpose of classification. *See*, 10 V.S.A. §§ 1250-84.

2. All waters of the State shall be managed to support their designated and existing uses. (Standards, Section 29A-104(b)).

3. The designated uses of waters of the State are: aquatic biota and wildlife that may utilize or are present in the waters; aquatic habitat to support aquatic biota, wildlife, or plant life; the use of waters for swimming and other primary contact recreation; the use of waters for boating and related recreational uses; the use of waters for fishing and related recreational uses; the use of waters for the enjoyment of aesthetic conditions; the use of the water for public water source; and the use of water for irrigation of crops and other agricultural uses. (Standards, Section 29A-104(d)).

4. The affected reaches of the Missisquoi River have been classified as Class B(2) for all uses, as defined pursuant to 10 V.S.A. § 1252(a).

5. The Antidegradation Policy in the Standards requires that “[a]ll waters shall be managed in accordance with these [Standards] to protect, maintain, and improve water quality.” (Standards, Section 29A-105(a)).

6. The affected reaches of the Missisquoi River are designated as warm water fish habitat. (Standards, Section 29A-308).

7. In waters designated as warm-water fish habitat, the Standards establish the dissolved oxygen criteria for Class B(2) waters as not less than 5 mg/L and 60 percent saturation at all times. (Standards, Section 29A-302(5)(B)).

8. The general temperature standard for all waters is “[c]hange or rate of change in temperature, either upward or downward, shall be controlled to ensure full support of aquatic biota, wildlife, and aquatic habitat uses.” (Standards, Section 29A-302(1)(A)).

9. The temperature criteria in the Standards (Section 29A-302(1)(C)) establishes those applicable to warm water fisheries under all classes of waters as:

Lakes, Ponds, and Reservoirs not including Riverine Impoundments.

(I) For waters with an ambient temperature above 60°F, the total temperature change shall not exceed 1°F.

(II) For waters with an ambient temperature between 60°F and 50°F, the total temperature change shall not exceed 2°F.

(III) For waters with an ambient temperature below 50°F, the total temperature shall not exceed 3°F.

Rivers, Streams, Brooks, Creeks, and River Impoundments.

(I) For waters with an ambient temperature above 66°F, the total temperature change shall not exceed 1°F.

(II) For waters with an ambient temperature between 63°F and 66°F, the total temperature change shall not exceed 2°F.

(III) For waters with an ambient temperature between 59°F and 62°F, the total temperature change shall not exceed 3°F.

(IV) For waters with an ambient temperature between 55°F and 58°F, the total temperature shall not exceed 4°F.

(V) For waters with an ambient temperature below 55°F, the total temperature change shall not exceed 5°F.

10. The turbidity standard as an annual average under dry weather base-flow conditions is 25 NTU (nephelometric turbidity units) for warm water fish habitat. (Standards, Section 29A-302(4)(B)).

11. The general criteria applicable to all waters include criteria that shall be achieved regardless of their classification include “[s]ludge deposits or solid refuse. None.” (Standards, Section 29A-303(1)).

12. The management objectives for waters classified as Class B(2) for aquatic biota and wildlife are “[w]aters shall be managed to achieve and maintain good biological integrity.” (Standards, Section 29A-306(a)(3)(A)). The Class B(2) criteria for aquatic biota and wildlife use require “[c]hange from the natural condition for aquatic macroinvertebrate and fish assemblages not exceeding moderate changes in the relative proportions of taxonomic, functional, tolerant, and intolerant aquatic organisms.” (Standards, Section 29A-306(a)(3)(B)).

13. The management objectives for waters classified as Class B(2) for aquatic habitat are “[w]aters shall be managed to achieve and maintain high quality aquatic habitat. The physical habitat structure, stream processes, and flow characteristics of rivers and streams and physical character and water level of lakes and ponds necessary to fully support all life-cycle functions of aquatic biota and wildlife, including overwintering and reproductive requirements, are maintained and protected.” (Standards, Section 29A-306(b)(3)(A)). The Class B(2) criteria for aquatic habitat use in rivers and streams require “[c]hanges to flow characteristics, physical habitat structure, and stream processes [be] limited to moderate differences from the natural condition and consistent with the full support of high quality aquatic habitat (Standards, Section 29A-306(b)(3)(B)(i)). Additionally, Class (B)(2) “[w]aters shall comply with the Hydrology Criteria in Section 29A-304” of the Standards. (Standards,

Section 29A-306(b)(3)(B)(iii)).

14. The hydrology policy in the Standards state that "[t]he proper management of water resources now and for the future requires careful consideration of the interruption of the natural flow regime and the fluctuation of water levels resulting from the construction of new, and the operation of existing, dams, diversions, and other control structures." (Standards, Section 29A-103(f)(1)).

15. To effectively implement the hydrology policy, the following hydrology criteria shall be achieved and maintained where applicable. (Standards, Section 29A-304(a)). For waters classified as Class B(2) for aquatic habitat, the hydrology criteria require that "[a]ny change from the natural flow regime shall provide for maintenance of flow characteristics that ensure the full support of uses and comply with the applicable water quality criteria." (Standards, Section 29A-304(b)(3)). Further, the Standards establish "the preferred method for ensuring compliance with this subsection is a site-specific flow study. In the absence of a site-specific study, the Secretary may establish hydrologic standards and impose additional hydrologic constraints, consistent with any applicable Agency of Natural Resources rule or procedure, to ensure compliance with the requirements of [§ 29A-304(b)(3) of the Standards]." (Standards, Section 29A-304(b)(3)).

16. The water level fluctuation criteria for lakes, ponds, reservoirs, riverine impoundments, and any other waters classified as Class B(2) for aquatic habitat or boating establish that "waters may exhibit artificial variations in water level when subject to water level management, but only to the extent that such variations ensure full support of uses." (Standards, Section 29A-304(d)(2)).

17. The management objective for waters classified as Class B(2) for aesthetics is "[w]aters shall be managed to achieve and maintain good aesthetic quality." (Standards, Section 29A-306(c)(3)(A)). The Class B(2) criteria for aesthetics in rivers and streams requires "[w]ater character, flows, water level, bed and channel characteristics, and flowing and falling water of good aesthetic value." (Standards, Section 29A-306(c)(3)(B)(i)).

18. The management objective for waters classified as Class B(2) for boating is "[w]aters shall be managed to achieve and maintain a level of water quality compatible with good quality boating." (Standards, Section 29A-306(d)(3)(A)). The Class B(2) criteria for boating use is "waters shall comply with the Hydrology Criteria in § 29A-304 of [the Standards]." (Standards, Section 29A-306(d)(3)(B)).

19. The management objectives for waters classified as Class B(2) for swimming and other primary contact recreation are "[w]here sustained direct contact with the water occurs, waters shall be managed to achieve and maintain a level of water quality compatible with good quality swimming and other primary contact recreation with very negligible risk of illness or injury from conditions that are a result of human activities." (Standards, Section 29A-306(f)(4)(A)).

20. The management objective for waters classified as Class B(2) for fishing is "[w]aters shall be managed to achieve and maintain a level of water quality compatible with good quality fishing." (Standards, Section 29A-306(e)(3)(A)). The criteria for fishing are "measures of wild salmonid densities, biomass, and age composition indicative of good population levels" and compliance with the temperature criteria in Section 29A-302(B) of the Standards. (Standards, Sections 29A-306(e)(3)(B)(i) and 29A-306(e)(3)(B)(ii)).

II. Factual Findings

A. General Setting and Background

21. The Sheldon Springs Hydroelectric Project is an existing licensed project located on the Missisquoi River in Sheldon within Franklin County, Vermont.

22. The Missisquoi River is a major tributary of Lake Champlain. The Missisquoi River is 93 miles in length and drains approximately 855 square miles, which includes lands both in Vermont and in Canada. The river originates near Lowell, Vermont, flowing northward for about 10 miles before entering into Quebec, Canada for 15 miles. The river reenters the State of Vermont in East Richford and generally flows westerly towards Lake Champlain.

23. There are dams located on the Missisquoi River some of which are FERC licensed and produce hydropower. Starting at the most downstream portion of the Missisquoi River, Lower Swanton Dam has no hydropower facilities. The next upstream dam is Highgate Falls Hydroelectric Project (FERC No. 2547), which currently operates as both a peaking and run-of-river mode facility during portions of the year. The third dam on the Missisquoi River is the Sheldon Springs Project.

24. Upstream of Sheldon Spring the Village of Enosburg owns and operates Enosburg Falls Dam (FERC No. 2905). This Project is currently licensed to operate in a peaking mode for a portion of the year. The Missisquoi River then proceeds north into Canada and then turns southwest and returns back into Vermont. Two additional hydroelectric projects, North Troy (FERC No. 10172) and Troy (FERC No. 13381), are licensed to operate in a run-of-river mode and are located in the upper portion of the Missisquoi River.

B. Project and Civil Works

25. The Sheldon Springs Hydroelectric Project consists of a number of features. The dam was constructed in 1908 and is an Ambursen-type buttress dam that is 35.5 feet high and 283 feet long, which is made of concrete. The dam is topped with 2-foot-high wooden flashboards bringing the crest elevation to 328.8 feet[1] NGVD29.

26. Built into the dam is a hydraulically operated flap gate. The flap gate is near the left abutment and is 16 feet wide and 8 feet high. This flap gate is used to release water under high flow conditions and to sluice ice and river debris. Additionally, the flap

[1]All elevations are in National Geodetic Vertical Datum of 1929 (NGVD29) unless otherwise indicated.

gate is designed to automatically open to provide the minimum bypass flow, if Unit 3 trips offline. This will be discussed in more detail below in Finding 52.

27. Integral to the dam is a minimum flow unit, Unit 6. This unit is designed to pass 70 cubic feet per second (cfs) into the upper bypassed reach. This is a non-variable unit and does not have the ability to throttle over a range of flows. Should Unit 6 trip offline, there is a gate designed to automatically open and pass the currently required conservation flow of 70 cfs.

28. With the flashboards in place, the Project impoundment extends approximately 2.5 miles upstream and is 175 acres. Within the impoundment there is a spur dike. This was constructed after the Project began operating because excessive water turbulence in the forebay was limiting the capacity for generation. This required a license amendment that was obtained in 1995.

29. Water from the impoundment enters three different intakes at the Project. The first intake leads to the Main Powerhouse and is 30 feet wide by 52.5 feet high. The second intake is located in the upper gate house which leads to the Mill Canal and contains four vertical gate lifts. Three of the gate lifts are 6 feet wide by 8.25 feet high, and the last gate lift is 4 feet wide by 8.25 feet high. The last intake leads to the minimum flow unit located at the dam and is 10 feet wide by 8 feet high.

30. The intake for the Main Powerhouse conveys water into a penstock. The penstock is buried underground and is 1750 feet long and 16 feet in diameter. This is made of reinforced concrete. The penstock passes underneath the Missisquoi River and the Mill Canal. Toward the Main Powerhouse the penstock bifurcates into two concrete encased steel penstocks conveying water to both Unit 1 and 2.

31. Both Units 1 and 2 contain identical vertical Kaplan turbines. These units have a hydraulic capacity from 250 cfs to 1,306 cfs.

32. The Upper Gate House leads to the Mill Canal, which is a 750-foot-long unlined earthen canal that averages 50-feet wide and 8-feet deep. The canal also contains a 50-foot-long spillway should excess flow enter the canal. Flow is controlled by stop logs placed between piers. The Mill Canal conveys water to Units 3, 4, and 5, in addition to providing a continuous flow of 15 cfs to the WestRock Paper Mill to use for processing.

33. At the end of the Mill Canal, there is another intake which has four bays and moves water to the penstocks for Units 3, 4, and 5. Bay 4 leads to a steel penstock that conveys water to Unit 3, located in the South Mill Powerhouse, and is 470-foot-long and 6-foot wide. This penstock is located both underground and above ground. Unit 3 does not contain its own ‘powerhouse’, instead it sits within the WestRock Mill building. Unit 3 is a Francis-type turbine with a hydraulic capacity that ranges from 112 cfs to 260 cfs. However, the Applicant typically maintains a minimum flow of 215 cfs through the Unit.

34. Bays 1, 2, and 3 lead to the penstock that conveys water to Units 4 and 5 located in

the Grinder Room Powerhouse. This penstock is also steel and is 140-feet-long and 12-foot in diameter. This penstock is located entirely underground until it reaches the Grinder Room Powerhouse. Units 4 and 5 are both Francis-type turbines with a hydraulic capacity of 80 cfs to 200 cfs. Originally Units 4 and 5 were connected to mechanical pulp grinders. In 1987, these grinders were reconfigured for hydroelectric generation.

35. There are multiple tailraces associated with the Project. These include: the Main Powerhouse tailrace which is 40-feet wide, 20-feet deep, and 125-feet long; the South Mill Powerhouse, which is 15-feet wide, 4-feet deep, and 50-feet long; the Grinder Room Powerhouse tailrace which is 30-feet wide, 6-feet deep, and 100-feet long; and lastly the minimum flow unit which discharges directly into a bedrock pool in the bypassed reach at the base of the dam.

36. Other necessary equipment is located within the powerhouses or within the Project boundary, which includes the high-voltage transmission line and substation transformers.

37. In addition to the facilities needed for electrical generation, the Applicant maintains recreational areas at the Project site for boating, fishing, sightseeing, and picnicking. The picnic area is located off the main road (Shawville Road) and is near the dam after crossing a single lane bridge over the power canal. The picnic area sits on a large grass space that is regularly mowed and overlooks the dam. The picnic area has two picnic tables and an information kiosk with a map of the facilities at the Project and a portable toilet.

38. The Project provides access for boating into the bypassed reach. This area is used for whitewater boating typically. The put in is just below the dam and the take-out is located nearer to the Mill buildings. To access the put in, boaters use an unmarked informal footpath that leads to the bypassed reach.

39. The Applicant also maintains a canoe portage that is roughly 1.4 miles long. The upstream location is an unimproved boat landing along a grassy shoreline. There is signage upstream of the Project dam that notes the location. An informal footpath connects this location to Shawville Road. The portage follows Shawville Road to Heather Lane. The intersection of Shawville Road and Heather Lane Road includes signage that describes the portage route and directions to take.

40. Heather Lane continues through the Project area passing a solar project and ending at a parking area near the Main Powerhouse. There is a small gravel road that leads from the parking area to the small gravel shore at the confluence of the bypassed reach and Main Powerhouse tailrace.

C. River Hydrology

41. The Missisquoi River drains a total area of 855 square miles, a portion of which (236 square miles) are located in Canada. The Missisquoi River begins in Lowell, Vermont and ends at the confluence with Lake Champlain. Major tributaries to the

Missisquoi River include Black Creek, Tyler Branch, Trout River, Mud Creek, and Hungerford Brook.

42. The United States Geological Survey (USGS) maintains a gage (Gage No. 04293500) on the Missisquoi River near East Berkshire, Vermont, which is located upstream of the Project. The drainage area at the gage near East Berkshire, Vermont, is 479 square miles. An additional USGS gage (Gage No. 04294000) is located downstream of the Project on the Missisquoi River at Swanton, Vermont with a drainage area of 850 square miles.

43. There are some known water withdrawals in the Missisquoi River watershed. These include Jay Peak for snowmaking purposes, the Town of Fairfield for irrigation purposes, and the Town of Richford for drinking water. Additionally, water is withdrawn at the Project for industrial use by the WestRock Paper Mill.

44. However, it should be noted that not all water withdrawals may be known. As of 2023, Vermont enacted a water withdrawal registration program. An individual or applicant that withdraws 10,000 gallons or more of surface water within a 24-hour period, or 150,000 gallons or more over a 30-day period must register with the State.

45. Hydrologic statistics for the Project site were estimated using the USGS gage located near East Berkshire and prorating that flow to the drainage area at the Sheldon Springs Hydroelectric Project. The USGS gage near East Berkshire was utilized as the Missisquoi River upstream of the gage is unregulated. In contrast, flow at the USGS gage at Swanton, Vermont, is potentially regulated because there are hydroelectric projects that have the potential to store and release flow and are located upstream of the gage.

Table 1. Hydraulic statistics at Sheldon Springs Hydroelectric Project. Statistics were calculated using flow from the Missisquoi River East Berkshire USGS gage (Gage No. 04293500). Although some statistics showed overall trends through time, potentially indicating a shift in river hydrology, not all statistics did, therefore the entire period of record was used. One exception is the estimated 7Q10 where some data was missing therefore some years of record were not included.

Hydrologic statistic	**Discharge Cubic feet per second (cfs)**	**Discharge Cubic feet per second per square mile (csm)**
10 % Exceedance Flow	3,866	4.82
50 % Exceedance Flow	841	1.05
90 % Exceedance Flow	248	0.31
7Q10*	96	0.12

*7Q10 is the seven-day low flow that occurs statically once every 10 years.

46. A similar process can be used to estimate the monthly median and mean flow values at the Project site. The flow statistics in the table below (Table 2) were estimated using the USGS gag at Swanton site (04294000) and prorating that flow

to the drainage area at the Sheldon Springs Hydroelectric Project. While this gage is influenced by peaking operations because values are averaged over the course of the month these effects will likely be negligible.

Table 2. Flow statics for the mean and median flows at the Project site by month. These were estimated using the USGS gage (04294000) and prorated to the project location. The period of record used to calculate the median and mean were May 1, 1990 to December 31, 2020. Flows are presented in cubic feet per second.

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Mean	1,564	1,040	2,488	4,607	2,064	1,308	886	730	626	1,543	1,883	1,779
Median	873	653	1,495	3,708	1,345	749	504	333	303	854	1,326	1,205

D. Current Operations

47. Currently, the Project is licensed to operate in a peaking mode that allows fluctuation of the impoundment up to two (2) feet from the top of the dam's crest to the top of the flashboards. The flashboards at the facility are designed to fail when water is approximately two (2) feet above the flashboards.

48. After the flashboards fail following a high flow event, the impoundment gradually decreases until it reaches just above the dam crest. To replace the flashboards, the impoundment is drawn down an additional two (2) to three (3) inches below the crest. Reinstalling flashboards takes approximately 2-3 hours. Once complete, the impoundment is refilled. This process occurs approximately 3-4 times a year.

49. In 1999, the Vermont Fish and Wildlife Department (VTFWD) requested the Applicant to voluntarily operate the Project in run-of-river mode from April 1 to May 31 for the protection of spawning fish downstream of Lower Swanton Dam. Later in 2006, VTFWD requested that the run-of-river operations be extended to June 15th each year for the protection and incubation of spawning fish in the reach below Lower Swanton Dam. On both occasions, the Applicant accommodated the requests.

50. Additionally, the Applicant notes that the Project has operated in run-of-river mode year-round for approximately the last (10) years. In 2021, the Applicant filed an application for a non-capacity amendment to the current license to formally change the operating mode of the Project from peaking operations with two (2) feet of storage to run-of-river year-round. FERC did not accept this amendment and instead the Applicant has included run-of-river operations in the relicensing Application.

51. The Sheldon Springs Hydroelectric Project bypasses a portion of the Missisquoi River that is approximately 4,700 feet long. There are two sections of the bypassed reach, the upper bypass and the lower bypass. The current license requires 70 cfs, or inflow if less, be provided into the upper portion of the bypassed reach. Additionally, the Applicant must provide a minimum flow of 270 cfs, or inflow if less,

in the lower portion of the bypassed reach downstream of the South Mill tailrace. Lastly, the Applicant is required to maintain a flow of 285 cfs, or inflow if less, below the Main Powerhouse tailrace.

52. The minimum flow in the upper bypassed reach of 70 cfs is provided using Unit 6. Should Unit 6 trip offline, the Applicant has programed a flap gate to open automatically. The Applicant then provides 215 cfs from the South Mill Powerhouse utilizing Unit 3, which combined with the 70 cfs from upstream results in the 285 cfs required below the South Mill tailrace. Should Unit 3 trip offline, a similar flap gate at the dam is programed to automatically open and provide the 215 cfs flow.

53. In July of 1984 before the issuance of the current license, the Department and the Applicant were able to reach a settlement agreement related to whitewater boating in the bypassed reach. The agreement indicated that a maximum of six (6) weekend days per year for seven (7) hours would be provided by the Applicant. The table below (Table 3) describes how flows through the Project were provided for recreational whitewater boating opportunities in the bypassed reach.

Table 3. The Sheldon Springs Hydroelectric Project provides whitewater releases through the bypassed reach for the purposes of recreation. This table indicates how the Applicant currently is providing flows at the Project according to a settlement agreement reached in 1984.

Inflow	Flows used for generation	Flows to be passed through the bypassed reach
Less than 2,000	All flows	Only minimum requirements
Between 2,000 and 3,499	1,000 cfs	Remaining flows available
Between 3,500 and 5,999	Remain flows available	2,500 cfs
Greater than 6,000	3,500 cfs	Remaining flows available

54. The settlement agreement indicated that these scheduled releases would be done in coordination with paddlers, the Applicant, and the Department. There was an attempt to coordinate ahead of time to identify weekend days to provide whitewater flows into the bypassed reach. However, at the time of the proposed releases, there was not enough incoming flow to provide whitewater flows. Accordingly, in 2013 it was agreed that a short notice and opportunistic releases would take place depending on natural inflows.

E. Applicants Proposal

55. The Applicant is proposing to operate the Project year-round in a run-of-river mode.[2] This would mean the project would not operate out of storage and water levels would not be drawn down, except during maintenance conditions or during flashboard replacement.

[2] Run-of-river mode means that the Project does not operate out of storage and outflow tracks inflow on a near-instantaneous basis.

56. The Applicant proposes to consult with the Vermont Agency of Natural Resources if there is a need for an impoundment drawdown for maintenance or repairs. The purpose is to identify needed measures for the protection of the state endangered Cylindrical Papershell mussel (*Anodonotoides ferussacainus*).

57. During occasions when the impoundment is drawdown, the Applicant proposes to refill the impoundment by storing ten percent (10%) of inflow while passing the remaining 90% inflow downstream.

58. The Applicant proposes maintain the current conservation flows into the bypassed reach. Specifically, the Applicant proposes to provide a continuous flow of 70 cfs, or inflow if less, to the upper bypassed reach. Additionally, the Applicant proposes to provide a continuous flow of 285 cfs or inflow if less into the lower bypass reach.

59. The Applicant proposes to provide an aesthetic flow of 0.75 inches, or inflow if less, over the flashboards from 7:00 am to 8:00 pm everyday from May 1 to October 31. The priority for providing flows are if inflow is less than 70 cfs, then all units will be shut down and all flows will be spilled over the dam. If inflows are between 70 cfs and 285 cfs, 70 cfs will be provided at the dam followed by an aesthetic flow, with the remaining flow would be maintained through Unit 3.

60. The Applicant proposes to provide whitewater releases into the bypassed reach while minimizing flow fluctuations downstream of the Project. The Applicant is proposing to provide up to six (6) whitewater releases at the Project following ramping requirements. Three (3) of those releases would be scheduled in advance and the additional three (3) releases would be scheduled opportunistically depending on flow availability.

61. When flows are greater than 4,742 cfs, the Applicant proposes to provide 1,300 cfs into the bypassed reach, and no ramping will occur since the Applicant will already be spilling. If inflow is greater than or equal to 2,942 cfs and less than the target release plus the hydraulic capacity of the Project, the release will be ramped up and down at 900 cfs per hour.

62. If inflow is greater than 2,000 cfs and less than 2,941 cfs, the release will be ramped up and down at 500 cfs per hour. If inflow is greater than 1,500 cfs and less than 1,999 cfs, the release will be ramped up and down at 350 cfs per hour. Lastly, if inflow is greater than 800 cfs and less than 1,499 cfs, the release will be ramped up and down at 250 cfs per hour.

63. The Applicant proposes to only release whitewater flows when inflow to the Project is greater than 800 cfs.

64. In addition to the whitewater releases, the Applicant is proposing a series of recreational protection, enhancement, and mitigation measures. The Applicant is proposing to seek land rights from WestRock at the upstream portage takeout for the path from the Missisquoi River to Shawville Road. Additionally, the Applicant proposes to remount the “Danger Dam ahead-Portage Here” sign to make it more

clear from the takeout area. The Applicant proposes to create two (2) parking spots near the Main Powerhouse, approximately 300 feet upstream of the canoe put-in at the Main Powerhouse tailrace. Signage will also be included in parking area for clarity. The Applicant is also proposing improvements to the whitewater put-in below the dam and the whitewater take-out near the mill Buildings. The put-in area will include rearranging boulders for easier step approaches. At the take-out, the Applicant is proposing to add signage directing boaters to a more gently sloped takeout area a short distance downstream of the current take-out.

65. The Applicant proposes to continue to maintain a telephone line at the Project to respond to requests for information about flow conditions at the Project[3].

66. The Applicant also proposes to decommission the Grinder units, Units 4 and 5 at the Project, this would reduce the maximum hydraulic capacity from 3,342 cfs to 2,942 cfs. The Applicant proposes a multistep process for decommissioning Units 4 and 5.

67. The Applicant proposes to first install stoplogs in the lower Canal Gatehouse, temporarily, which will allow the underground steel penstock to be dewatered, therefore keeping all work areas dry. A small portion of the penstock where it enters the Mill building will be removed. A concrete plug will be installed and connected to the walls and foundation using anchors and dowels.

68. Once the concrete plug is complete the remaining portions of the penstock will be filled with lightweight concrete. The grinder units will remain in the building, with all the lubricants, hydraulic fluids, oils and greases removed. All of the electrical equipment will be disconnected and removed.

F. Current Status of Waters in the Project Area

69. In March 2024, the U.S. Environmental Protection Agency approved a list of waters considered to be impaired based on water quality monitoring efforts and in need of total maximum daily load (TMDL) development to address pollution. The Department submitted the list under section 303(d) of the Federal Clean Water Act.

70. According to the State of Vermont's 2024 303(d) list of impaired surface waters, there are no waters within or near the Project area listed.

71. The Department concurrently issued a five-part list of priority surface waters outside the scope of Section 303(d) of the Clean Water Act in 2024. These waters correspond to Category 4c of EPA's Consolidated Assessment Listing Methodology. To the extent, this listing may be affected by the Applicant's proposal, these waters are described below.

72. Part F lists surface waters where designated uses are altered by flow regulation. The reach of the Missisquoi River between the Sheldon Springs Hydroelectric Project and the Highgate Falls Hydroelectric Project is listed as a priority water in

[3] FERC Environmental Analysis issued February 3, 2026.

Part F due to the effects of reservoir water level and flow fluctuation associated with hydropower production on aquatic life support and secondary contact recreation.

73. The Agency's publication *Hydropower in Vermont: An Assessment of Environmental Problems and Opportunities*, is a State comprehensive plan. The plan describes hydroelectric development as a significant impact on Vermont streams with power projects usually located on important scenic and ecological sections of streams. Artificial regulation and diversion of natural stream flows were found to have largely reduced the success of State initiatives to restore the beneficial values and uses for which the affected waters are managed under the federal Clean Water Act and Vermont law.

74. The Missisquoi River watershed is listed as Basin 6 and the last Tactical Basin Plan for Basin 6 was issued in 2021. Although the town of Sheldon Springs was noted in the Basin Plan, its mention was related to stormwater management and wastewater treatment facilities.

G. Water Chemistry

75. There are facilities located on the Missisquoi River that require a National Pollutant Discharge Elimination System (NPDES) permit. These permits are required when facilities discharge wastewater directly into surface waters. There are eight (8) NPDES permits for discharges on the mainstem of the Missisquoi River.

76. There are three (3) NPDES permits located within the Project area, one of which is for the Sheldon Springs Hydroelectric Project. The other two permits are for the Sheldon Wastewater Treatment Plant and the WestRock Converting Company (WestRock Paper Mill). There are four (4) facilities located upstream of the Project located in Troy, North Troy, Richford, and Enosburg Falls, Vermont. One additional facility is located downstream of the Project in Swanton, Vermont.

77. As part of the relicensing process, the Applicant collected water quality data at the Project that included dissolved oxygen (DO) and temperature. The objective of the study was to collect the parameters at multiple locations to determine if Project operations were contributing to any potential water quality concerns.

78. The goal of the study was to collect water quality data under low flow and high temperature conditions. Specifically, flow should be less than three (3) times 7Q10. HOBO data loggers were used to record data at 15-minute intervals. Loggers were installed in the Project area on June 29, 2021, and removed either October 6, 2021, or October 7, 2021.

79. There were seven (7) loggers installed at various locations. These locations included: (1) a free-flowing section upstream of the Project impoundment; (2) within the Project impoundment at the deepest location; (3) at the Main Powerhouse intake (Units 1 and 2) positioned at approximately half the depth of the intake and 40 feet upstream of the intake; (4) at the downstream end of the canal at the intake for Units 4 and 5 (Grinder units) and Unit 3 (South Mill Powerhouse) at approximately half the

depth of the intake and 30 feet upstream; (5) in the bypassed reach below the dam and upstream of the Grinder units and South Mill Powerhouse tailrace; (6) in the bypassed reach below the Grinder units and South Mill Powerhouse tailrace; and (7) below the Main Powerhouse tailrace.

80. The loggers were calibrated before installation. The loggers were checked approximately every two (2) weeks. When data was offloaded, spot checks were performed near the logger locations, before the loggers were returned to the monitoring locations. In addition to the loggers placed in the Missisquoi River, one (1) additional logger was placed on dry land to measure barometric pressure to accurately calculate dissolved oxygen.

81. Flows varied while loggers were in place at the Project. The daily average maximum flow ranged from 88 cfs to 485 cfs. The daily average minimum flow ranged from 92 cfs to 386 cfs. Temperatures at the Project were slightly above normal for most of the duration over which the loggers were installed. The table below provides a summary of the dissolved oxygen data collected in 2021 at the sampling locations at the Project. The following locations are included in the table UPS-1 (Free-flowing section upstream of the Project impoundment backwater); IMP-1 (Within the Project Impoundment, affixed to the boat barrier line at the deepest spot); INT-1 (At the Main Powerhouse intake); INT-2 (At the downstream end of the canal at the intake for the Grinder Units (Units 4 and 5) and South Mill Powerhouse (Unit 3)); BYP-1 (In the bypass below the dam, but upstream of the Grinder Units/South Mill Powerhouse tailwater); BYP-2 (In the bypass, below the Grinder Units/South Mill Powerhouse tailrace); and TWL-1 (Below the Main Powerhouse tailrace).

Table 4. Water Quality data collected at the Sheldon Springs Hydroelectric Project in 2021. The water quality data is summarized by providing the average (Mean), minimum (Min), and maximum (Max) values collected during the sampling season at each logger location. The loggers were located throughout the Project area UPS-1 (Free-flowing section upstream of the Project impoundment backwater); IMP-1 (Within the Project Impoundment, affixed to the boat barrier line at the deepest spot); INT-1 (At the Main Powerhouse intake); INT-2 (At the downstream end of the canal at the intake for the Grinder Units (Units 4 and 5) and South Mill Powerhouse (Unit 3)); BYP-1 (In the bypass below the dam, but upstream of the Grinder Units/South Mill Powerhouse tailwater); BYP-2 (In the bypass, below the Grinder Units/South Mill Powerhouse tailrace); and TWL-1 (Below the Main Powerhouse tailrace). Dissolved Oxygen (DO) is expressed in milligrams per Liter (mg/L) and as percent saturation (DO %), which is in part affected by water temperature.

	DO (mg/L)			**DO (%)**		
Location	Mean	Min	Max	Mean	Min	Max
UPS-1	8.63	6.55	11.82	100.0	83.6	145.2
IMP-1	8.58	3.97	11.00	99.5	49.9	125.7
INT-1	5.33	0.00	10.77	58.1	0.1	118.6
INT-2	7.34	0.96	10.76	85.3	11.5	127.6
BYP-1	8.77	7.60	10.98	101.9	92.8	115.8
BYP-2	8.72	7.44	11.29	101.3	90.4	126.2
TWL-1	8.86	6.57	12.76	102.9	80.4	143.9

82. The Project operated intermittently while the loggers were recording data. Grinder Units 4 and 5 and the Main Powerhouse Unit 1 were not operated during the study period. All other units operated for various durations. The Main Powerhouse Unit 2 operated very little, for a few hours only while two (2) loggers remained installed. South Mill Powerhouse Unit 3 operated for a few days. The minimum flow unit (Unit 6) remained operated the most amount of time, however, it still went offline during low flow conditions a number of times throughout the study period.

83. There were occasions when dissolved oxygen did not meet the Standards. At the Project impoundment site IMP-1, dissolved oxygen dropped below 5 mg/L and 60% saturation in the evening of August 22 and into August 23. The Main Powerhouse Intake INT-1 also fell below the Standards June 30 to July 10, July 12 to July 31, and August 9 through September 3. The Canal Intake INT-2 also fell below standards from August 9 to August 25. No generation occurred at the South Mill Powerhouse (Unit 3) during this period.

84. The remaining locations both in the bypassed reach (BYP-1 and BYP-2) and the Main Powerhouse tailrace (TWL-1) all remained above 5 mg/L and 60% saturation during the study. These locations were all free-flowing while the loggers were installed.

85. Temperature was also recorded at each logger location. Table 5 below summarizes the temperature data collected at all sites.

Table 5. Temperature water quality data collected at the Sheldon Springs Hydroelectric Project in 2021. The water quality data is summarized by providing the average (mean), minimum (min), and maximum (Max) values collected during the sampling season at each logger location. The loggers were located throughout the Project area UPS-1 (Free-flowing section upstream of the Project impoundment backwater); IMP-1 (Within the Project Impoundment, affixed to the boat barrier line at the deepest spot); INT-1 (At the Main Powerhouse intake); INT-2 (At the downstream end of the canal at the intake for the Grinder Units (Units 4 and 5) and South Mill Powerhouse (Unit 3)); BYP-1 (In the bypass below the dam, but upstream of the Grinder Units/South Mill Powerhouse tailwater); BYP-2 (In the bypass, below the Grinder Units/South Mill Powerhouse tailrace); and TWL-1 (Below the Main Powerhouse tailrace).

	Water Temperature (Degrees Celsius)		
Location	Mean	Minimum	Maximum
UPS-1	22.5	13.6	31.0
IMP-1	22.5	14.0	28.9
INT-1	20.1	14.0	22.4
INT-2	22.7	14.2	28.7
BYP-1	22.7	14.1	28.6
BYP-2	22.6	14.2	29.5
TWL-1	22.6	14.2	29.4

86. The temperature data showed diurnal fluctuations throughout the study period. These fluctuations are anticipated with increasing daily warming, and these temperature swings occurred at nearly all Project locations. The Main Powerhouse intake (INT-1) which houses Units 1 and 2, recorded slightly lower water temperatures relative to the others, and did not experience the same daily swings observed at the other logger locations.

H. Aquatic Biota

87. "Aquatic Biota" means all organisms that, as part of their natural life cycles, live in or on waters. (Standards, Section 29A-102(5)). Aquatic biota includes fish, aquatic invertebrates, amphibians, and some reptiles such as turtles.

88. The Missisquoi River is classified by the State of Vermont as Class B(2) for the aquatic biota designated use and is designated as warm water fish habitat. There are a number of fish species located in the Missisquoi River, those species include, but are not limited to, those identified in the table below (Table 6).

Table 6. Fish species located in the vicinity of the Project. This is not a full species list but those that are known or likely to occur.

Common Name	Scientific Name
Brook Trout	*Salvelinus fontinalis*
Rainbow Trout	*Oncorhynchus mykiss*
Brown Trout	*Salmo trutta*
Smallmouth Bass	*Micropterus dolomieu*
Rock Bass	*Ambloplites rupestris*
White Sucker	*Catostomus commersonii*
Fallfish	*Semotilus corporalis*

89. Upstream of the Project area there is a trophy trout section, which means that it is stocked with two-year-old Rainbow Trout. The area upstream of the Project is also recognized as a quality Smallmouth Bass fishery.

90. In addition to the fish species located near the Project area downstream of the facility, there are a number of Lake Champlain species that migrate into the lower Missisquoi River. Most of these species are unable to migrate upstream of the Lower Swanton Dam, however, flow fluctuations associated with the Project may impact spawning species in the area just downstream of the Lower Swanton Dam.

91. Properly sized and positioned intake screening is necessary to minimize impingement and entrainment. Operation of a hydroelectric project without adequate exclusionary screening may subject fish to impingement on the trashracks or entrainment through the turbine, which conflicts with the management objectives for aquatic biota set forth in the Standards.

92. As part of the relicensing, the Applicant conducted a desktop entrainment and impingement study. The goal of this study was to determine what, if any, impacts

there may be to fish due to impingement or entrainment at the Project. The target species to be evaluated for this exercise included Chain Pickeral juveniles and adults, Smallmouth Bass juveniles and adults, White Sucker juveniles and adults, Yellow Perch juveniles and adults, Brown Trout adults, and Tessellated Darter adults. This study used existing information, including but not limited to known turbine specifications, fish species life histories, general habitat preferences, and scientific literature.

93. One measure of a fish's ability to swim quickly for short distances or time intervals less than 15 seconds, is commonly referred to as "burst speed." Burst speed depends on the species and size of the individual. The burst speed of a fish is related to the ability of a fish to capture prey, avoid predators, or in the case of hydroelectric facilities, avoid water velocities at the trashracks and into the turbines. Burst speeds have been estimated in the scientific literature and are often presented as a range.

94. An additional measure of swimming ability for fish is "prolonged" swimming, which refers to the ability of a fish to swim for shorter periods of time, but longer than those initial bursts of temporary speed. The Applicant reviewed scientific literature to develop a range of swim speeds for fish species and lifestages of interest as shown in Table 7.

Table 7. Various swimming speeds of target species and life stages for estimation of entrainment. Burst speed typically is the speed a fish can swim for less than 15 seconds. A prolonged speed can be sustained by a fish between 15 and 200 seconds. Speeds are presented in either feet per second (f/s) or centimeters per second (cm/s). Additional literature data include speed per fishes body length was omitted for clarity, although it appears the range of values is representative.

Species	Life stage	Body length (inches)	Prolonged (feet per second)	Burst Speed (feet per second)
Brown Trout	Adult	6-16	1.8-4.3	7-12.7
Chain Pickerel	Juvenile	4.25	0.73	0.84
	Adult	7.9-23.6	0.84-1.53	
	Adult	10.8		8.2
	Adult	15.7		11.5
Fallfish (Substitute Chub)	Juvenile	0.94-3.6	0.68-1.31*	0.78-1.51*
	Adult	7-12	0.7-3.6	0.81-4.14
Smallmouth Bass	Juvenile	3.6	1.3-1.8	1.5-2.07
	Adult	9.4-15	2.1-3.2	3.5-5.6
Tessellated Darter	Adult	1.4	1.3	1.5
White Sucker	Juvenile	6.7-7	1.2-1.6	1.39-5.2*
	Adult	9-15	1.9-2.4	2.19-10.2
Yellow Perch	Juvenile	3.5	1.7	2
	Adult	9.6	3.36	5.6

*Note that the indicated swim speed ranges pulled from the literature have an overlap where the

largest juvenile size category has a higher value than the smallest adult size category. This is an artifact of needing to use different sources for juvenile and adult swim speeds.

95. In addition to understanding the target species burst speed, calculating the velocity through the trashracks is also required. The through rack velocity was calculated conservatively assuming maximum turbine discharge. Unit 6 is typically always in operation and has an intake velocity of 0.88 ft/sec. Unit 3 also has its own trashrack and the estimated intake velocity is approximately 1.38 ft/sec. Units 1 and 2 share an intake structure and with both turbines running at maximum capacity the intake velocity is approximately 2.24 ft/sec. However, this only occurs at the highest flows, approximately 17 % of the time. Units 4 and 5 are proposing to be decommissioned so are not considered.

96. If an individual fish is unable to escape the velocity through the trashracks and are small enough to avoid impingement, they may become entrained, which is when a fish or other aquatic organism is drawn into a water intake and travels into a turbine. The survival of a fish through a turbine depends on the length of the fish and the type of turbine. The likelihood of a fish becoming entrained not only depends on the size of the individual but also their expected life histories, movement patterns, availability of habitat near the intakes, and how those yearly patterns change in relation to typical Project operations through the year.

97. Combining all of these considerations, the ability for a fish outswim the intake velocities, the likelihood that a fish species and life stage will be present in the intake area, the time of year when the turbine is likely to utilized to its maximum capacity can all be compared qualitatively from high, moderate, low, or none, for the likelihood to encounter the intake. The following table (Table 8) summarizes the potential for an individual fish to become entrained at the intake.

Table 8. Target fish species and life stages are categorized by the likelihood to become entrained into a turbine unit at the Sheldon Springs Hydroelectric Project. Each of the Project's units are separated because of the maximum hydraulic capacity and trashrack designs. The likelihood of becoming entrained depends on the fish size, burst speed, prolonged swim speed, through rack velocity, and habitat preferences.

Species	Life Stage	Entrainment potential for each fish		
		Units 1 and 2	Units 3	Unit 6
Brown Trout	Adult	None	None	None
Chain Pickerel	Juvenile	Moderate	Moderate	Moderate
	Adult	Low	Low	Low
Fallfish	Juvenile	Low	Low	Low
	Adult	None	None	None
Smallmouth Bass	Juvenile	Moderate	Low	Low
	Adult	Low	Low	Low
Tessellated Darter	Adult	Moderate	Low	Low

White Sucker	Juvenile	Moderate	Low	Low
	Adult	Low	Low	Low
Yellow Perch	Juvenile	Low	Low	Low
	Adult	Low	Low	Low

98. If fish are entrained at the intake, the individual then enters the turbine. The Applicant used the Franke Calculation (Franke et al. 1997) to estimate survival of an individual who may enter a turbine unit.[4] The calculation includes a number of factors including the runner speed, the turbine type, the hydraulic capacity of each unit, and the fish size. This information can be summarized as predicted survival based on a percentage.

99. Predicted survival is best indicated by fish length. The analysis was conducted for Unit 1 and Unit 2 given there was a higher number of species and lifestages qualitatively identified as having a moderate potential relative to the other units. Predicted survival for individuals entrained at Unit 1 and Unit 2 that were 10 inches or less in length was 90% or greater. Fish with a length of 20 inches or less had a predicted survival rate of 80% or greater, and fish with a length of 30 inches or less had a predicted survival rate of approximately 72% or greater.

100. Macroinvertebrates and mussels, which are typically associated with benthic zones, inhabit the reaches affected by the Project. The Applicant conducted a freshwater mussel study as part of the relicensing. Ten (10) sites were surveyed in the impoundment, two (2) sites were surveyed in the bypassed reach, and one (1) site was surveyed in the tailrace. Surveyed sites were selected based on available habitat and best professional judgment by the Applicant's mussel biologist. A number of mussel species were located including Cylindrical Papershell (*Anodantoides ferussacianus*), Triangle Floater (*Alasmidonta undulata),* Creeper (*Strophpitu undulatus*), Eastern Ellipto (*Elliptio complanata*), Eastern Lampshell (*Lampsilis radiata*) and Eastern Floater (*Pyganodon Cataracta*). Cylindrical Papershell is listed as endangered in the State of Vermont and will be discussed in greater detail below.

101. No live mussels were located within the bypassed reach. The bypass provided very little habitat due to its steeper gradient and coarse rocky substrate. The highest catch per unit effort for the species observed occurred within the impoundment. In general, the mussels occurred at varying densities with the highest densities observed in depths from 1 to 5 feet in fairly shallow, nearshore, stable habitats.

102. Although not part of the relicensing, benthic macroinvertebrate data has been collected near the Project area. The Department, as part of its biological monitoring efforts, conducts macroinvertebrate assessments. Between 1992 and 2018, data

[4] Franke, G.F., D.R. Webb, R.K. Fisher, Jr., D. Mathur, P.N Hopping, P.A. March, M.R. Headrick, I.T. Laczo, Y. Ventikso, and F. Sotiropoulos. 1997. Development of environmentally advanced hydropower turbine system design concepts. Prepared for U.S. Department of Energy, Idaho Operations Office Contract DE-AC07-94ID13223.

was collected at a site approximately 4.5 miles upstream of the Project and a site approximately four (4) miles downstream of the Project.

103. A number of metrics are collected as part of these assessments, which results in a rating ranging from poor to excellent depending on the estimated metrics. The table below provides the macroinvertebrate data and metrics collected between 1992 and 2018 at the two sites. The metrics in the table include: (1) density or relative abundance of macroinvertebrates; (2) richness or number of distinct taxa; (3) EPT richness or number of distinct taxa from the more sensitive orders (Ephemeroptera, Plecoptera, and Trichoptera); (4) PMA-O or the precent model affinity of orders which is a measure of order-level similarity to a model based on reference streams; (5) B.I. is the Hilsenhoff Biotic Index which is a measure of the precent of the community that consists of the subclass Oligochaeta and is an indicator of tolerance; (6) EPT/EPT + Chironomidae is the ratio of the abundance of the intolerant EPT taxa and the generally tolerant Chironomidae; and (7) PPCS-F is the Pinkham-Pearson Coefficient of Similarity for functional groups is a measure of functional feeding groups to a model based on the reference streams.

Table 9. Summary statistics for benthic macroinvertebrate sampling at different dates at two sampling locations. For details on specific values and locations see Findings 102 and 103.

Location and Date	Density	Richness	EPT Richness	PMA -O	B.I.	Oligo.	EPT/ EPT+Chiro	PPSC -F	Assessment
Downstream									
9/24/2009	4744	46.0	26.0	77.7	3.76	0.34	0.94	0.42	Good
924/2018	4020	42.0	26.0	79.6	3.82	0.00	0.99	0.32	Good
Upstream									
9/30/1992	3296	45.5	28.5	70.2	4.31	0	0.88	0.49	Excellent
9/2/1999	3796	36.5	16.5	73.5	4.72	0.31	0.84	0.43	Good
10/18/2009	2676	50.0	27.0	78.2	4.48	0	0.76	0.64	Very Good
9/30/2013	4252	41.0	21.0	73.5	3.89	0	0.92	0.34	Good-Fair

I. Aquatic Habitat

104. The Missisquoi River is classified by the State of Vermont as Class B(2) for the aquatic habitat designated use. Waters classified as Class B(2) for the aquatic habitat use shall be managed to achieve and maintain high quality aquatic habitat, characterized by the physical habitat structure, stream processes, and flow characteristics of rivers and streams and the physical character and water level of lakes and ponds necessary to protect and support all life-cycle functions of aquatic biota and wildlife, including overwintering and reproduction requirements. (Standards, Section 29A-306(b)(3)(A)).

105. The Sheldon Springs Hydroelectric Project has an approximately 175-acre impoundment. This extends upstream from the dam roughly 2.5 miles at the normal impoundment elevation of 328.8 feet.

106. Within the impoundment there is a dike spur. This was installed after the Project was built because excessive turbulence within the water column limited generation. The flow diversion spur now directs water toward the Main Powerhouse intake.

Flow Needs for the Protection of Aquatic Habitat

107. The Applicant is proposing to operate the Project in a run-of-river mode. This means the Project will not operate out of storage and will release flow downstream on an instantaneous or near instantaneous basis. For this reason, flow downstream of the Main Powerhouse tailrace will coincide with flow entering the Project and thus follow the hydrology of the Missisquoi River at the Project.

108. As water is diverted for generation, there is approximately 4,700 feet of the Missisquoi River that is bypassed. As part of the relicensing process, the Applicant conducted a flow habitat study. The goal of the study was to quantitatively assess the relationship between flow and aquatic habitat for target species and life stages in the bypass reach.

109. In consultation with the Department and the Vermont Fish and Wildlife Department (VTFWD), four (4) transects were selected for the study. One transect representative of a riffle and one of a run were selected in the upper bypassed reach. This was then repeated in the lower bypassed reach where one transect representative of a riffle and one of a run were selected for the study.

110. Five (5) target flows were evaluated 70 cfs, 160 cfs, 241 cfs, 312 cfs, and 391 cfs. The Department requested flow evaluation up to 0.5 cubic feet per square mile (csm) at the Project. Additionally, all flows were provided at the dam crest so that uniform discharge was provided throughout both the upper and lower bypassed reached.

111. There was some variation in the estimates of spillage through the flap gate or over the dam crest and flow calculated in the reach. The Applicant was able to assess 70 cfs using the minimum flow turbine. The target flow of 241 cfs was not assessed. This is because during the original attempt it was realized that the discharge was lower than the targeted 241 cfs. In an attempt to increase and reach the target flow, the measured discharge was estimated to be 325 cfs during the data processing. However, because the other target flows bracketed the target 241 cfs, there was not an attempt to conduct an additional field data for the flow. The remaining flows assessed were within 15 cfs of the target flow.

112. The target species and life stages included Smallmouth Bass juveniles and adults, Fallfish juveniles and adults, White Sucker juveniles and adults, Tessellated Darter adults, and benthic macroinvertebrates. In addition to the benthic macroinvertebrate assessment requested by the Department, the Applicant also assessed habitat

suitability of benthic macroinvertebrates, specific to the Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa.[5]

113. In the upper bypassed reach, for nearly all target species available habitat is lower at lower discharges and begins to increase with increasing flow until a certain point. After this, available habitat decreases with increasing flow. This trend is observed for Smallmouth Bass adults and juveniles, Fallfish adults and juveniles, Tessellated Darter adults, benthic macroinvertebrates, and each of the EPT taxa. The one exception is for White Sucker where the maximum available habitat is observed at the lowest flows, habitat then begins to decrease as flows increase. The table below (Table 10) describes the flow at which specific percentages of maximum available habitat are reached for each target species and life stage in the upper bypassed reach.

Table 10. Summary of flows in cubic feet per second (cfs) where an individual species or taxa reaches a specific percentage of observed available habitat. These results are from the flow habitat study in the upper bypass reach at the Sheldon Springs Hydroelectric Project.

	Flow where 80 percent of the maximum observed habitat occurs	Flow where 90 percent of the maximum observed habitat occurs	Flow where 100 percent of the maximum observed habitat occurs
Smallmouth Bass Adult	NA	90	325
Smallmouth Bass Juvenile	155	245	325
Fallfish Adult	NA	90	325
Fallfish Juvenile	130	171	325
White Sucker Juvenile & Adult	335	240	70
Tessellated Darter	NA	70	325
Benthic Macroinvertebrates	255	290	325
Ephemeroptera	70	195	325
Plecoptera	200	260	325
Trichoptera	100	210	325

114. The lower bypassed reach is slightly different. All target species and life stages followed the same trend where at low flows the percent of maximum available habitat was the lowest. Habitat for all species then increased reaching the maximum available at a flow of 325 cfs. The table below (Table 11) describes the flow at which specific percentages of maximum available habitat are reached for each target species and life stage in the lower bypassed reach.

[5] Gore, James A. 2001. Macroinvertebrate Instream Flow Studies After 20 Years: A Role in Stream Management and Restoration. Regulated Rivers: Research & Management.

Table 11. Summary of flows in cubic feet per second (cfs) where an individual species or taxa reaches a specific percentage of observed available habitat. These results are from the flow habitat study in the lower bypass reach at the Sheldon Springs Hydroelectric Project.

	Flow where 80 percent of the maximum observed habitat occurs	Flow where 90 percent of the maximum observed habitat occurs	Flow where 100 percent of the maximum observed habitat occurs
Smallmouth Bass Adult	150	245	325
Smallmouth Bass Juvenile	140	225	325
Fallfish Adult	105	210	325
Fallfish Juvenile	255	290	325
White Sucker Juvenile & Adult	70	230	325
Tessellated Darter	195	260	325
Benthic Macroinvertebrates	255	290	325
Ephemeroptera	80	160	325
Plecoptera	171	245	325
Trichoptera	100	190	325

Water Level Fluctuation in the Impoundment

115. The Applicant is proposing to operate the Project in a run-of-river mode. This will limit the impoundment fluctuations within the reach to those occasions when there is a need for maintenance that requires an impoundment drawdown and during flashboard replacement.

116. The Applicant is proposing to consult with the Agency when there are maintenance needs that require the impoundment to be drawn down. In addition, the Applicant proposes to refill the impoundment following the 90/10 procedure. This is when 90 percent of the inflow is passed downstream of the Project and the remaining 10 percent is used to refill the impoundment (Findings 56 and 57).

117. Atop the dam crest the Applicant currently utilizes 2-foot flashboards. The flashboards are wooden and designed to fail when there is approximately two (2) feet of water overtopping them. The Applicant notes that the flashboards typically need to be replaced three (3) to four (4) times a year, typically in the spring.

118. When the flashboards fail, the Applicant is unable to keep the impoundment at an elevation of 328.8 feet, and as high flows recede the impoundment gradually lowers to the dam crest elevation of 326.8 feet. To reinstall the flashboards, the Applicant typically draws down the impoundment roughly two (2) to three (3) inches below the dam crest for two (2) to three (3) hours until flashboards can be reinstalled.

Stream Processes and Physical Habitat Structure

119. Stream processes are defined as the hydrologic, bed-load sediment, and large woody debris regimes of a particular stream reach and is a term used to describe stream channel hydraulics, or the erosion, deposition, sorting, and distribution of instream materials by the power of flowing water. Stream processes work toward an equilibrium condition, are governed by flow characteristics, stream morphology, channel roughness, and floodplain connectivity and, in part, determine physical habitat structure and aquatic habitat quality (Standards, Section 29A-102 (43)).

120. Physical habitat structure is defined as the diverse combination and complexity of instream forms created within substrate and woody debris on and within the bed and banks of the channel by stream processes and flow characteristics. Physical habitat structure, in part, determines aquatic habitat quality at the stream reach and stream network scales by providing for all life cycle functions, which include the full set of forms necessary for the provision of and access to cover, overwintering, and temperature refuge and the substrates necessary for feeding and reproduction of aquatic biota and wildlife (Standards, Section 29A-102 (33)).

121. Erosion is a natural process that occurs in waterbodies. There are a number of forces acting on the substrates, channels, and corridors of rivers. There are many processes that can contribute to erosion within rivers, some include the hydraulics of river flows, freeze thaw cycles, and abrasion which reforms stream channels. Erosion can also be exacerbated by anthropogenic causes. Bank erosion occurs when the various forces of erosion exceed the resisting force of the bank material.

122. The Applicant conducted a shoreline assessment as part of an archaeology study completed during the relicensing process. The erosion study assessed areas within the impoundment and bypassed reach. Areas that have erosion were either characterized as ‘some’, ‘some to extensive’, or ‘extensive’.

123. There were two (2) main types of erosion noted within the archaeology study: fluvial and mass wasting. Fluvial erosion was identified as removal of sediment due to water, typically in small amounts at a time. Common types are undercut banks, sheet erosion, or gullies. Mass wasting is typically erosion due to gravity. Common examples are falls, topples, and slides.

124. Areas within the impoundment where extensive or some extensive erosion was identified share some characteristics. The soils along these areas consist of silty loam, which are vulnerable to erosion. Additionally, aerial photos suggest that agricultural use extends close or right next to the shoreline.

125. The Applicant is proposing to operate the Project in run-of-river mode. Operating in this manner will reduce the frequency the impoundment fluctuates and therefore reduce the likelihood of increased erosion.

Protection and Support of Life Cycle Functions

126. Water level fluctuations at times throughout the year can affect spawning fish, their eggs, and fry, and can therefore interfere with reproduction. This is particularly true for nearshore habitat, either in the impoundment or riverine reach, that can become dewatered with fluctuating flows and water levels.

127. The Applicant is proposing to operate in run-of-river mode year-round. This will limit the potential for nearshore habitat to dewatered on a regular basis. Impoundment fluctuations will be limited to drawdowns related to maintenance activities and flashboard replacement.

128. The Applicant is proposing to provide whitewater releases into the bypassed reach of the Project (Findings 60- 63). Given the length of the Project's bypass, there is a delay between when flows are provided into the bypassed reach and then reach the Main Powerhouse Tailrace. This delay can cause water level fluctuations in the riverine reach downstream of the Project. The Applicant is proposing a ramping procedure to limit the fluctuations of water levels downstream of the Project during the spring and on other occasions when whitewater releases are provided opportunistically.

129. Of particular concern is the area located below Lower Swanton Dam, in Swanton, Vermont. There are a number of spawning species that swim into the Missisquoi River from Lake Champlain and utilize the cobble and boulder substrates for spawning and incubation including Lake Sturgeon (state listed as endangered[6]), Lake Whitefish (species of greatest conservation need[4]), and Longnose Gar among others.

130. The Applicant conducted an on-water boating evaluation (see Recreation section) and the Applicant also evaluated how to pass flows through the Project to limit the flow fluctuations downstream of the Project. The goal of the study was to determine the ramping requirements needed to limit downstream flow fluctuations. Ramping would occur by reducing generation at the Project and allowing additional spill into the bypassed reach. Ramping is required due to the amount of time required for flows to pass through the bypassed reach of the Missisquoi River and continue downstream.

131. The Project does not propose to provide whitewater flow releases out of impoundment storage, therefore the amount of water provided into the bypassed reach depends on inflow to the Project. To provide ramping flows, the Applicant would alter generation hourly until the desired flow in the bypassed reach is provided. The whitewater flows into the bypass would be provided for four (4) hours, then the Applicant would gradually increase generation flows following the same ramping procedure until normal operations can be resumed.

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[6]https://www.vtfishandwildlife.com/sites/fishandwildlife/files/documents/About%20Us/Budget%20and%20Planning/WAP2015/__2015-VT-Wildlife-Action-Plan.pdf

132. To evaluate the proposed ramping procedure, the Applicant installed water level loggers in 2021 and 2024 at three (3) locations. The locations included the lower bypassed reach above the Main Powerhouse tailrace but below the South Mill Powerhouse tailrace, approximately 50 feet upstream of the Machia Road bridge in Highgate, and about 2,000 feet downstream of the Swanton Dam, in Swanton, Vermont.

133. The Applicant proposes the following ramping proposal to be evaluated. When flows are greater than 4,242 cfs, the Applicant proposes to provide 1,300 cfs into the bypassed reach, and no ramping will occur since the Applicant will already be spilling. If inflow is greater than or equal to 2,942 cfs and less than the target release plus the hydraulic capacity of the Project, the release will be ramped up and down at 900 cfs per hour.

134. If inflow is greater than 2,000 cfs and less than 2,942 cfs, the release will be ramped up and down at 500 cfs per hour. If inflow is greater than 1500 cfs and less than 2,000 cfs, the release will be ramped up and down at 350 cfs per hour. Lastly, if inflow is greater than 800 cfs and less than 1,500 cfs, the Applicant proposes the release will be ramped up and down at 350 cfs per hour.

135. Although the Applicant was unable to evaluate each target specifically, they were able to reach target points within the range proposed. The scenario included releasing the target whitewater flows for a total of 4 hours into the bypassed reach. The table below (Table 12) describes the whitewater release scenarios that occurred.

Table 12. As part of the assessment for whitewater boating releases, the Applicant conducted a study to determine water level changes downstream of the Project. To gather this information, the Applicant released a number of flows into the bypassed reach following a ramping procedure. A summary of how water moved through the Project for the purposes of whitewater releases into the bypassed reach includes, the minimum and maximum flow at the Project, the target whitewater release into the bypassed reach (Target Release), the proposed ramping rate, and the date that the test occurred.

Scenario	Maximum Flow (cfs)	Minimum Flow (cfs)	Target Release (cfs)	Ramping Rate (cfs/hour)	Test Date
High	4,742	2,942	1,300	900	4/16/24
Mid-High	2,941	2,000	1,300	500	5/8/21
Mid-Low	1,999	1,500	1,300	350	4/5/24
Low	1,499	800	1,300	250	5/30/24

136. Water level loggers recorded the changes during the testing periods at all three locations. The water level change varied based on the location of the logger and the time it took for the flow to reach the logger locations. Given attenuation in the Missisquoi River, there were some occasions where it was challenging to identify the exact time when the flow change began. This required comparing the flows around the anticipated flow release and when the release was completed. The table below (Table 13) indicates the scenario and the maximum change in water level at

each logger location during the evaluation.

Table 13. The results from the whitewater flow assessment included ramping and various scenarios of whitewater releases into the bypassed reach at the Sheldon Springs Hydroelectric Project. Locations of water level loggers included one within the bypassed reach and two downstream of the Project including the primary area of interest below Swanton Dam, where a number of fish species move into the Missisquoi River from Lake Champlain to spawn.

Scenario	Bypassed Reach (feet)	Machia Rd. (feet)	Below Swanton Dam (feet)
High	1.65	0.23	0.21
Mid-High	1.99	0.6	0.18
Mid-Low	1.55	0.62	0.15
Low	1.13	0.58	0.13

J. Wildlife and Wetlands

137. The Vermont Water Quality Standards require the Secretary of the Agency of Natural Resources to identify and protect existing uses of State waters, which include those of surficial wetlands. The Standards prohibit activities that degrade the existing uses of wetlands. These uses can include fish and wildlife habitat, fishing, swimming, recreation, water quality maintenance, and other uses. (Standards, Sections 29A-104 and 29A-105).

138. Additionally, wetlands that are classified as Class II are protected under 10 V.S.A Chapter 37 and the Vermont Wetland Rules. The goal of the Vermont Wetland Rules is to prevent the net loss of significant wetlands in Vermont (Vermont Wetland Rules, Section 1.1).

139. The National Wetland Inventory database identified wetlands in the Project area. Five (5) types were identified and these include Palustrine, emergent, temporary flooded (PEM1A), Palustrine forested, temporary flooded (PFO1A), Forested seasonally flooded (PFOIC), Riverine, lower perennial, unconsolidated bottom and permanently flooded (R2UBH), Riverine lower perennial, unconsolidated shore, seasonally flooded (R2USC), and Palustrine, emergent, persistent, seasonally flooded. There are no additional wetlands identified by the Department.

K. Rare, Threatened, and Endangered Species

140. There are State and federally listed rare, threatened, and endangered (RTE) species are located or potentially located within the project area. Some of these include northern long-eared bat (*Myotis septentrionalis*), tricolored bat (*Perimyotis subflavus*), Cylindrical Papershell (*Anodantoides ferussacianus*), Great St. Johns Wort (*Hypericum ascyron)*, Marsh Vetchling (*Lathyrus palustris)*, and Wild Garlic (*Allium canadense* var. *canadense*). Monarch Butterfly (*Danaus plexipus*) is a candidate species and consideration for listing federally.

141. In addition to those listed above, some migratory birds may occur in the area that are protected at either the state or federal level. However, not all listed species fall

under the purview of this Certification.

Northern Long-eared Bat

142. The Northern long-eared Bat (*Mytosis septentrionalis*) is federally listed as threatened and state listed as endangered. This species is in serious danger of extirpation in Vermont and across its range. While the primary stressor is White-nose syndrome, loss of maternity roosts is also considered a concern.[7]

143. This species winters in caves and cave-like structures, but summers in tree cavities, under bark or in hallows of live and dead trees. Tree maintenance has the potential to disrupt roosts between April 1 and October 31. There are no known occurrences, habitat, or winter hibernacula of Northern Long-eared Bat within a one-mile radius of the Project boundary.

Tricolored Bat

144. The Tricolored Bat (*Perimyotis subflavus*) is listed as endangered in Vermont. Similarly to Northern Long-eared Bat, this bat winters in caves and cave-like structures, but summers in tree cavities, under bark or in hallows of live and dead trees. Further south, this species has also been known to roost in mosses.

145. The Tricolored Bat faces similar threats as the Northern Long-eared Bat. Tree maintenance has the potential to disrupt roosts between April 1st and October 31st. There are no known occurrences, habitat, or winter hibernacula of Tricolored Bat within a one-mile radius of the Project boundary.

Cylindrical Papershell

146. Cylindrical Papershell (*Anodontoides ferussacianus*) is State listed as endangered. Cylindrical Papershell are a small to medium sized mussel. Similar to most mussels, this species has a preference for silt-sand and gravel substrates. This species has an unusual life cycle, but similar to other freshwater mussels. Male mussels release sperm into the water, which is filtered by female mussels where eggs are then fertilized. After some duration (which varies by species) females release larvae called glochidia. The glochidia as part of their life cycle then attach to the gills of fish. Each mussel species has a specific fish species host. After the glochidia mature, they release from the fish gills and mature into adults.

147. It is assumed that this species spawns in the winter and releases glochidia in the spring or early summer however, this has not been confirmed in Vermont. The host fish species for this mussel can include Bluegill, Black Crappie, Spotfin Shiner, Largemouth Bass, Mottled Sculpin, Bluntnose Minnow, Common Shiner, and White Sucker.

[7] Vermont Fish & Wildlife Department. 2015. Vermont Wildlife Action Plan 2015. Vermont Fish & Wildlife Department. Montpelier, VT. https://vtfishandwildlife.com/node/551

148. As part of the relicensing process, the Applicant collected data on mussels in the Project area (Findings 100 and 101). Within the impoundment, the entire area was first kayaked and visually assessed before selecting sites. Surveys at the sites were conducted by either SCUBA diving or by snorkeling.

149. This state listed species was found in moderate to high densities within the impoundment ranging from 3 to 111 individuals at a site. Cylindrical papershell were also located downstream of the tailrace. Individuals were located in depths between 0.5 feet and 5 feet deep, although many were located in the 1 to 3 foot range. The report notes that there appeared to be greater number of individuals located near the shorelines. The only other mussel species found in greater quantities was the common Eastern Elliptio.

Plants

150. As part of the relicensing process the Applicant conducted a RTE plant survey in the Project affected area. The focus areas included the recreational sites including the portage around the dam, a 50-foot shoreline area surrounding the bypassed reach, the impoundment, and a short distance near the Main Powerhouse at the tailrace.

151. The Applicant visited the site for two (2) years, 2021 and 2022, visiting the areas of interest multiple times within a growing season. The multiple visits increased the likelihood of identifying the species of interest during their flowering periods. There were a number of species of interest for this portion of the Missisquoi River. The table below (Table 14) notes the species of interest and their flowering period for easier identification.

Table 14. Plant species of interest at the Sheldon Springs Hydroelectric Project. These plants were the target species to locate within the Project boundary and includes the times each species is most likely to flower for identification purposes.

Common Name	Scientific Name	State Status	Flowering period	Potential location
Meadow Garlic	*Allium canadenses var. conadense*	Threatened	May- July	Potential for populations downstream
Marsh Vetchling	*Lathyrus palustris*	Threatened	June-July	Located in Project vicinity but no species known
Great St. John's Wort	*Hypericum ascyron*	Threatened	July – August	Previously documented in the Project bypass
Marsh Horsetail	*Equisetum palustre*	Threatened	June- August	Occurs other locations in the Missisquoi River
Virginia Water-Horehound	*Lycopus virginicus*	Rare/Uncommon	July- August	Occurs other locations in the Missisquoi River
Cut-Leaved Anemone	*Anemone multifida*	Species of concern	May- August	Occurs other locations in the Missisquoi River
Clan MacGregor Wild Rye	*Elymus macgregorii*	Possibly extinct/extirpated	May- June	Occurs other locations in the Missisquoi River
Twin-Flower Hedge Bindweed	*Calystegia silvativa var. fraterniflora*	Rare	June- August	Occurs other locations on the Missisquoi River

152. Throughout the numerous site visits and extensive surveys, three species of interest were located in the Project area, these include the Meadow Garlic, Marsh Vetchling, and Great St. John's Wort. The species of interested were mostly concentrated to two (2) locations within the bypassed reach. No species of interest were located within the impoundment. Additionally, no species of interest were located in recreational areas.

153. In the upper portion of the bypassed reach, all three species were observed at different times of the year. All were generally clustered together and ranged in elevations from 276.9 feet and 281.5 feet. In the upper portion of the bypassed reach, the area is more complex with larger boulders and outcroppings. As part of the habitat flow study, it was estimated that flow of 377 cfs equates to approximately 278.9 feet in elevation which could inundate some of the species of interest. However, where these specific plants are located there is a hydraulic control so under flows of that magnitude water does not appear to reach that area. Higher flows such as those that naturally occur during the spring may inundate the area.

154. In the mid-portion of the bypassed reach, there was one observation of Marsh Vetchling. This plant species was located at an elevation unlikely to be inundated by bypass flows except for naturally occurring high flow events.

155. In the lower bypass reach, two (2) species of interest were observed, the Meadow Garlic and Great St. John's Wort. Plants in this area ranged in elevation from 216.0 feet to 218.7 feet. Similar to the upper bypass, the lower bypass was also part of the habitat flow study. It was estimated that at flows of 377 cfs, the corresponding water surface elevation would be more than 2 feet below the target plant species.

156. Within the lower bypass reach, a RTE species was observed in the canoe portage by the gravel landing area near the Main Powerhouse. It was noted that although the area sees foot traffic, it is likely not enough to disturb the species.

157. While conducting the plant surveys, the Applicant paid particular attention to grasses and sedges located within the Project boundary. Despite the number of visits to the Project area, no rare, threatened, or endangered sedges or grasses were observed.

L. Recreation

158. There are numerous recreational opportunities in the vicinity of the Project. The Northern Forest Canoe trail, a 700-mile-long water trail, includes the Missisquoi River. Upstream of the Project, the Missisquoi River is listed by the National Parks Service as a part of the National Wild and Scenic River System. In addition to water resources, the area also has a number of hiking and state forested areas that can be accessed for recreation.

159. The Applicant maintains a number of recreational areas at the Project site for

boating, fishing, sightseeing and picnicking. The picnic area is located off Shawville Road and is near the dam after crossing a single lane bridge over the Project power canal. The picnic area sits on a large grass area that is regularly mowed and overlooks the dam. There are two picnic areas and each has two (2) picnic tables and an information kiosk with a map of the facilities at the Project and a portable toilet.

160. In the vicinity of the picnic area there is a gravel parking lot. It is estimated that there is room for 12 to 24 cars in the gravel area and mowed grassy locations.

161. The Project also has boating access into the bypassed reach. This area is used for whitewater boating. The put-in is just below the dam and the take-out is located nearer to the Mill buildings. To access the put-in boaters use an unmarked informal footpath that leads to the bypassed reach.

162. The Project has a canoe portage that is roughly 1.4 miles long. The upstream location is an unimproved boat landing along a grassy shoreline. There is signage upstream of the Dam that notes the location. An informal footpath connects this location to Shawville Road. The portage follows Shawville Road to Heather Lane Road. The intersection of Shawville Road and Heather Lane Road includes signage noting the portage route and directions to take.

163. Heather Lane continues through the Project area, passes a solar project, and ends at a parking area near the Main Powerhouse. There is a small gravel road that leads from the parking area to the small gravel shore area and the confluence of the bypassed reach and Main Powerhouse tailrace.

164. As part of the relicensing, the Applicant conducted a recreation assessment at the Project. The goal of the study was to assess the current condition of the Project facilities, use the of the current facilities, and identify potential opportunities where improvement or enhancement may be needed. To accomplish this, the Applicant identified property ownership in the vicinity of the Project recreational facilities, conducted an inventory of the Project facilities including assessment of the condition and ease of access. Additionally, the Applicant hosted a public meeting that was geared toward seeking input on safety concerns, potential for additional camping locations, and potential opportunities for improvement.

165. Overall, the recreational amenities were observed to be in good condition. Some boating paths were slightly overgrown, and moss was observed on the picnic table. The Northern Forest Canoe Trail association conducted an online survey and posted it online on a number of websites. When asked how recreational users perceived the facilities at the Project approximately 84% responded that they were satisfied.

166. From the recreational study, there were some suggestions where improvements could be made. One priority was securing an easement for the canoe portage take-out upstream of the dam, or providing a take-out on land owned by the Applicant assuring access into the future. Another suggestion was to develop a short portage

route around the Project.

167. During a focus group meeting hosted by the Applicant, additional suggestions were provided. Parking near the Main Powerhouse would benefit users at the portage put-in location. Although the area is gravel, it was unclear if parking was available.

168. For whitewater boaters, the typical put-in location part way down the bypass reach was steep and posed a potential safety issue with uneven footing, and a potential stone staircase could remedy the issue. Additionally, the whitewater takeout a short distance downstream is steep and boaters proposed an alternative location closer to the mill buildings.

169. Recreational users also noted occasional challenges for upstream boaters accessing the take-out on river right at the Main Powerhouse and suggested moving the takeout to another location. Recreational users also noted the need for additional campsite locations along the Missisquoi River and suggested a primitive campsite may be viable in the Project area.

170. The Applicant considered a number of the recreational improvement suggestions. The Applicant was unable to locate another portage route that provided an easier access or shorter and safer routes. This is mostly due to the topography of the area and wetlands at other locations. This also eliminated the opportunity to move the most downstream portage location.

171. The Applicant as part of these discussions does propose to improve the whitewater boater take out within the bypass reach. There is another foot path closer to the mill buildings. The Applicant proposes to direct boaters away from the existing steeper path and toward the new one which is a more gentle slope with signage. The whitewater put-in location may be improved in consultation with Vermont Historic Preservation given the sensitive artifacts in the area. The Applicant is not proposing to establish a primitive campsite since this would require coordination with other land owners in addition to local officials.

172. The Applicant is proposing to provide parking spots near the Main Powerhouse and include signage indicating the locations. Lastly, the Applicant proposes to include the portage route into the FERC boundary and improve applicable signage for the portage route, put-in and take-out.

Boating

173. The management objectives for waters classified as Class B(2) for boating are “[w]aters shall be managed to achieve and maintain a level of water quality compatible with good quality boating” (Standards, Section 29A-306(d)(3)(A)). The Class B(2) criteria for boating use is “waters shall comply with the Hydrology Criteria in [Section] 29A-304” of the Standards (Standards, Section 29A-306(d)(3)(B)).

174. As part of a settlement agreement, the Applicant has provided whitewater boating releases in the bypass reach at the Project (Findings 53 and 54). Although this

settlement agreement is in place, the Applicant has been unable to provide scheduled releases. Although whitewater boating releases were scheduled, they did not occur because high flows were not available at the Project. Instead, the Applicant and stakeholders tried an opportunistic approach. On short notice, when it was forecasted that flows would be adequate, American Whitewater and the Applicant would coordinate a release date and time.

175. As part of the relicensing, the Applicant conducted a whitewater study. This study had two (2) main objectives. The first was to evaluate the conditions needed to support whitewater boating which included acceptable flows, access needs, information needs, and potential frequency of whitewater releases. The second objective was to assess how to move water through the Project area and infrastructure to minimize downstream flow fluctuations during releases (see Findings 130- 136).

176. A group of volunteer boaters coordinated with the Applicant to conduct an on-water boating evaluation. In May of 2021, the Applicant conducted an on-water flow evaluation. Three (3) flows were assessed: 2,100 cfs, 1,500 cfs, and 1,200 cfs. A total of 16 individuals were able to participate, although not all individuals boated all flows. Boaters ranged in experience from expert to advanced. All but one (1) participant boated with a hard-shell kayak, with the last individual boating in a canoe.

177. At all three (3) flows, the overall experience for each boater was rated as either a 1 or 2 indicating an ‘acceptable’ or ‘totally acceptable’ experience. Some participants rated slightly lower (acceptable) and indicated that there was some wood and metal debris within the bypass which negatively affected the aesthetics. Additionally, one participant thought that the length of the run could be longer by introducing a slide for boaters to drop in at the base of the dam.

178. Participants noted they would likely return to boat the bypassed reach. Additional comments included that intermediate skills are required for this reach, minimum acceptable flows ranged from 500 cfs – 1,100 cfs and optimum flows ranged from 1,200 cfs – 2,400 cfs. The most common response for minimum acceptable flows was 800 cfs and the most common response for optimum flows was either 1,400 cfs, 2,000 cfs or 2,100 cfs. Lastly, participants noted that a range of flows within the bypassed reach is important. This allows individuals with different boat types, skills, and experiences the opportunity to boat this reach.

M. Debris

179. The depositing or emission of debris and other solids to State waters violates Vermont’s solid waste laws and Section 29A-303(1) and Section 29A-303(2) of the Standards. Debris may also impair aesthetics and boating.

180. The Applicant does not provide information on how debris is managed and disposed of at the Project. The Applicant notes that at the time of the spur dike installation at the Project dam a flap gate was installed. This flap gate is designed to

open and provide flows (215 cfs) into the bypassed reach should Unit 3 at the South Mill Powerhouse trip offline.

181. In addition to providing conservation flows into the bypassed reach, the flap gate will also release water under high flow conditions and is used to sluice ice and river debris downstream. The Applicant does not indicate if debris is handled differently depending on the material. Additionally, the Applicant provides no details on whether trash is managed at the trashracks.

N. Aesthetics

182. The management objectives for waters classified as Class B(2) for aesthetics are "[w]aters shall be managed to achieve and maintain good aesthetic quality" (Standards, Section 29A-306(c)(3)(A)). The Class B(2) criteria for aesthetics in rivers and streams are "[w]ater character, flows, water level, bed and channel characteristics, and flowing and falling water of good aesthetic value." (Standards, Section 29A-306(c)(3)(B)(i)).

183. The Applicant conducted an aesthetics study as part of the relicensing. The goal of the study was to determine the spillage to be passed over the dam flashboards that meets the aesthetics designated use. The demonstration was conducted in 2022 after consultation on the target flows to be spilled.

184. The study plan was to provide 70 cfs through the minimum flow unit and to discharge 215 cfs from the South Mill Powerhouse into the lower bypassed reach. The target flows to be passed over the dam included 7 cfs (0.5 inches), 13 cfs (0.75 inches), and 20 cfs (1.0 inch). Flows were estimated using the flashboard rating curve for the Project. In consultation with the Department, it was determined that a fourth target flow may be provided, but that determination would be made on site. At the time of the study, it was determined that a fourth flow was not needed.

185. The evaluation team consisted of two representatives from the Department and two representatives for the Applicant. A consultant for the Applicant was also present and did not evaluate flows but instead was responsible for developing the consensus sheet and acting as a tie breaker if needed. Three locations were used to assess the spillage flows for aesthetics. These locations were at the dam looking across the dam face and flashboards, approximately 590 feet downstream in the upper bypassed reach, and in the lower bypassed reach immediately upstream of the Main Powerhouse.

186. During the study, the assessment team agreed that the total flow in the lower bypassed reach would likely not significantly change at all flows. The lower bypass was only viewed at two of the three assessment flows, the 1.0 inch and 0.5 inches. The assessment at the Sheldon Springs Project started at the highest flow of 1 inch and then moved downward ending with 0.5 inches of flow. The following table (Table 15) is a summary of the consensus sheet from the assessment team.

Table 15. The consensus results of the assessment team from the aesthetics demonstration flow study conducted at the Sheldon Springs Hydroelectric Project. Locations of where spillage and flows were viewed in addition to an absolute rating and a rating relative to the previous flow observed.

Flashboard Spill Depth	Location	Absolute rating	Relative rating
1.0 inch	Dam	Good	N/A
	Upper Bypass	Good	N/A
	Lower Bypass	Good/Excellent	N/A
0.75 inch	Dam	Fair to Good	Slightly Worse
	Upper Bypass	Good	Slightly Worse
	Lower Bypass	Did not rank	Did not rank
0.5 inch	Dam	Fair	Worse
	Upper Bypass	Fair to Good	Slightly Worse
	Lower Bypass	Good	Slightly Worse than 1.0 inch but minimally

187. With one (1) inch of spillage the assessment team determined that the veil of water flowing over the flashboards was fairly even, with the exception of debris that blocked a portion, and the sound was good. There was also a nice cascade of flow just downstream of the Project dam over some larger rocks. In the upper bypass there was good circulation and sound, in addition to the whitewater cascade providing visual interest. In the lower bypass there was flow on both banks and the substrate was submerged. There was a diversity of habitat area, including riffles and there was good sound.

188. With 0.75 inches of spill, there was more of an uneven veil of water over the flashboards with the debris along creating a larger influence on the veil. The veil, although uneven, still covered the entire length of the Project dam. Within the upper bypass it was noted that there was not a lot of change relative to 1 inch of spillage. Some changes were a slight drop in water surface elevation and less turbulence at the tail out. The group did not visit the lower bypass reach for this spillage.

189. At half an inch (0.5) of spillage, the flow over the flashboards did not create a good veil, however the sound that was provided did not differ much from the 0.75 inches of spill. In the upper bypass it was noticeable that there was less movement through the lower portion of the cascade and through the pool. In the lower bypass there was little difference between half inch (0.5) and 1 inch of spillage. There was the potential that there was slightly less sound, however because it had just started to rain this could have interfered with the evaluation of sound.

III. Analysis

190. A state's 401 certification shall "evaluate whether the activity will comply with

applicable water quality requirements." 40 C.F.R §121.3(a). Accordingly, the Department may set forth limitations and other requirements necessary for it to find that there is reasonable assurance that the Project will be operated in a manner which will not violate Vermont Water Quality Standards. One goal of the Standards and the Clean Water Act is to restore the biological integrity of waters such that aquatic biota and wildlife are sustained by high quality habitat (Standards, Section 29A-103(a); 33 U.S.C. § 1251 et seq.).

191. Continued operation of the Project may lead to violations of Standards. Specific aspects of operations that have the potential to cause such violations are analyzed below to determine the limitations and requirements necessary to find that there is reasonable assurance that the activity will not violate Vermont Water Quality Standards.

192. In addition to the specific items pertaining to the Application under review, if any activity was not presented in the Application and is inconsistent with the Findings of this Certification, the Department reserves the right to review such activities to ensure they do not cause a violation of Vermont Water Quality Standards (e.g., change in operation, maintenance drawdown, construction activity, etc.). In addition to specific operational conditions, other provisions related to operations like reporting, inspections, and flow monitoring will also be necessary to ensure the activity does not violate the Vermont Water Quality Standards.

A. Water Chemistry

193. The Missisquoi River in the vicinity of the Project is classified as Class B(2) for all designated uses and is designated as warm water fish habitat. The criteria for the dissolved oxygen (DO) standard is not less than 5 mg/L and 60 percent saturation at all times (Standards, Section 29A-302(5)(B)).

194. As part of the relicensing, the Applicant conducted a water quality study where dissolved oxygen and temperature were collected at various locations in 2021. See Findings 77-86 for additional details.

195. There were several occasions when DO fell below Standards at the Project. These locations included within the impoundment, Main Powerhouse Intake, and Canal Intake (Table 4). Within the impoundment, the duration of the low DO was relatively short, however, within the intakes the duration varied from less than a day to more than two (2) weeks.

196. The goal of the study is to collect data under low flow and high temperature conditions for 10 days to evaluate potential Project effects. These criteria were met for the entire study duration. The low inflows to the Project meant that turbine generation was limited at the Main Powerhouse and South Mill Powerhouse. When those units were unable to generate, low DO was observed within the intakes, this is due to those areas being generally isolated.

197. The Project tailraces for all the powerhouses and the Project bypassed reach all

met the DO standards, under the low flow high temperature conditions in the Missisquoi River. Therefore, it is expected that continuing with run-of-river operations as proposed will continue to meet the DO standard. This Certification is being conditioned (Condition B) to accept the Applicant's proposal to operate in a run-of-river mode.

198. The general temperature standard for all waters is "[c]hange or rate of change in temperature, either upward or downward, shall be controlled to ensure full support of aquatic biota, wildlife, and aquatic habitat uses." (Standards, Section 29A-302(1)(A)). The temperature criteria in the Standards (Section 29A-302(1)(C)(ii)) establishes warm water fisheries under all classes of waters as:

a. Rivers, Streams, Brooks, Creeks, and River Impoundments.
    i. For waters with an ambient temperature above 66°F, the total temperature change shall not exceed 1°F.
    ii. For waters with an ambient temperature between 63°F and 66°F, the total temperature change shall not exceed 2°F.
    iii. For waters with an ambient temperature between 59°F and 62°F, the total temperature change shall not exceed 3°F.
    iv. For waters with an ambient temperature between 55°F and 58°F, the total temperature shall not exceed 4°F.
    v. For waters with an ambient temperature below 55°F, the total temperature change shall not exceed 5°F.

199. Temperature within the Project followed anticipated daily trends in riverine systems (Table 5). Specifically, daily fluctuations followed the increase and decrease in air temperatures throughout the day. Some locations like the Main Powerhouse intake saw slightly less variations while the units were not operational due to the limited water movement through the canal which resulted in cooler water temperatures during those times.

200. The Applicants proposal to operate the Project year-round in a run-of-river mode will continue to meet the temperature criteria of the Standards. This Certification is being conditioned (Condition B) on the adoption of the Applicant's proposal to operate in a run-of-river mode.

B. Aquatic Biota

201. "Aquatic Biota" means all organisms that, as part of their natural life cycles, live in or on waters. (Standards, Section 29A-102(4)). Aquatic biota includes fish, aquatic invertebrates, amphibians, and some reptiles such as turtles. There are a wide variety of species with different life histories and requirements for protection within the Sheldon Springs Project area. These include fully aquatic species, like fish, who spend their entire life cycles in the water, and organisms who do not such as turtles, beaver, and frogs.

202. The Applicant studied the potential for impingement and entrainment of resident fish species at the Project (see Findings 92- 99). The study concluded that in most

cases the likelihood of the target fish becoming entrained within a turbine is low (Table 8). Chain Pickeral juveniles had a moderate potential to become entrained at any of the Units in part due to their larger size with less swimming burst speed. Additionally, Tessellated Darter adults, White Sucker juveniles, and Smallmouth Bass juveniles had moderate potential for entrainment at Units 1 and 2.

203. Units 1 and 2 at the Main Powerhouse are only utilized at their highest capacity under high flow conditions. It is estimated that those units exceed two (2) feet per second approximately 17% of the time when those target species may be suspectable to entrainment. Units 1 and 2 are Kaplan turbines which have a low rotational speed; this design leads to a high survival rate.

204. The sizes of Chain Pickeral juveniles, Tessellated Darter adults, White Sucker juveniles, and Smallmouth Bass juveniles that are small enough to become entrained at the Main Powerhouse have and estimated survival between 84.9% to 95.4% when considering the immediate and 48-hour post survival estimates.

205. Chain Pickeral juveniles have lower estimated survival rates at Units 3 and 6. Unit 6, or the minimum flow unit, has an estimated survival ranging from 78% to 96.7% for fish who become entrained. Unit 3, a high-speed Francis turbine, has survival estimates between 46% and 72% for fish who become entrained. Unit 3 has relatively low survival rates, however, unit 3 is located some distance down a concrete canal at the Project. This is not typical habitat for Chain Pickeral therefore the likelihood that an individual will encounter Unit 3 is also low.

206. Mussels were located within the impoundment. Cylindrical Papershell mussel will be discussed below in the Rare, Threatened, and Endangered species section. Mussels were only located within the impoundment section of the Project. The Applicant is proposing to operate the facility in run-of-river mode year-round. This will limit water level fluctuations, and potential dewatering of mussels, to maintenance related activities.

207. The Applicant is proposing to consult with the Department for maintenance activities that require the impoundment to be drawn down in addition to following a refill procedure (Findings 56 and 57). This Certification is conditioned (Condition B) on the adoption of the Applicant's proposal to operate in run-of-river mode year-round, which will limit impoundment fluctuations.

208. To assure compliance with run-of-river operations, this Certification is conditioned (Condition C) to require the Applicant to develop a flow management and monitoring plan. A flow management and monitoring plan will provide additional details for how the Applicant will implement run-of-river operations with additional details on what equipment is needed for monitoring and how data will be recorded. This plan shall be reviewed and approved by the Department.

209. This Certification is conditioned (Condition H) to adopt the Applicant's proposal, with modification, to consult and seek approval from the Department for maintenance repair work that requires deviation from normal operations, or may

result in a discharge to states waters, unless otherwise noted and approved in the flow management and monitoring plan.

C. Aquatic Habitat

210. Waters designated as Class B(2) for aquatic habitat use shall be managed to achieve and maintain high quality aquatic habitat, characterized by the physical habitat structure, stream processes, and flow characteristics of rivers and streams and the physical character and water level of lakes and ponds necessary to protect and support all life-cycle functions of aquatic biota and wildlife, including overwintering and reproductive requirements (Standards, Section 29A-306(b)(3)(A)).

Flow Needs for the Protection of Aquatic Habitat

211. The Applicant conducted a habitat-flow study and considered the upper and lower bypassed reaches separately because there are two (2) different discharges into the bypass reach, one at the dam and the second downstream of the tailrace of the South Mill powerhouse, which houses Unit 3 (Findings 108 - 114).

212. The Department typically takes an approach to, at a minimum, maintain 80% of the maximum habitat observed for the most limiting species and life stages. In this case, there were multiple flows where all target fish species and lifestages (excluding benthic macroinvertebrates) had 80% or greater of their maximum observed available habitat in the bypassed reach. For the upper bypass reach flows between 155 cfs and 335 cfs provided 80% of the maximum habitat observed for the most limiting species and life stage. For the lower bypassed reach, flows between 255 cfs and 365 cfs provide 80% of the maximum observed habitat.

213. The results indicate that the flow needed for the protection of aquatic habitat does vary slightly between the upper and lower bypassed reach. The mesohabitat of the upper bypassed reach consists mainly of bedrock transitioning to large boulder. Just downstream of the dam is cascade like, then moves toward a pool/run sequence. Additionally, there are riffles and backwater sections in the upper bypassed reach. The lower bypass continues to be similar and consists of mostly large boulder. One exception is near the Main Powerhouse tailrace where smaller boulder is dominant. The lower bypassed reach transitions between riffles and runs, with pools also occurring although less frequently than in the upper bypassed reach.

214. The bypassed reach of the Missisquoi River at Sheldon Springs is a large mid-gradient river. The stream consists of larger substrates, and a variety of mesohabitat types including step pool run sequences, backwater areas, and riffles, with riffles being rarer in this reach.

215. In the upper bypassed reach, without including benthic macroinvertebrate habitat suitability curves, a flow of 155 cfs provides 80% of the maximum available habitat for the target species and life stages. A flow of 155 cfs provides for 54% of the maximum available habitat for benthic macroinvertebrates and 88%, 74%, and 85% for the EPT taxa respectively.

216. In the lower bypassed reach, to reach 80% of the maximum available habitat requires a higher flow. The most limiting species in the case of the lower bypassed reach is juvenile Fallfish and benthic macroinvertebrates with both reaching 80% of the maximum available habitat at a flow of 255 cfs. All remaining target species and lifestages have greater than 88% of the maximum available habitat at this flow.

217. The Department has reviewed the data and a minimum conservation flow of 155 cfs, or inflow if less, will support high quality aquatic habitat for Class B(2) waters for the upper bypassed reach. A flow of 255 cfs, or inflow if less, will support high quality aquatic habitat for Class B(2) waters in the lower bypassed reach. This Certification is conditioned (Condition B) to require the Applicant to provide 155 cfs into the upper and 255 cfs into lower bypassed reaches of the Missisquoi River, or inflow if less.

Water Level Fluctuation in the Impoundment

218. The Applicant proposes to operate the Project in true run-of-river mode. There is the potential for water level fluctuation to occur during deviations from normal operations and will be limited to those occasions when there is a maintenance or repair project that requires impoundment drawdowns (Findings 115-118).

219. The Applicant is proposing for impoundment refill to pass 90 percent of inflow and to store 10 percent to refill the impoundment. Additionally, the Applicant is proposing to consult with the Department if there is a need for an impoundment drawdown for maintenance or repairs.

220. The Applicant conducted a study to identify mussels within the Project area. A number of mussels were located within the impoundment (Findings 100 and 101), including some in shallower areas ranging from 1 to 5 feet.

221. This Certification is adopting the Applicant's proposal to operate in run-of-river mode year round (Condition B), and modifying the proposal to seek approval from the Department on maintenance occasions that require impoundment drawdowns or if there may be a discharge to state waters (Condition H) unless otherwise approved in the flow management and monitoring plan (Condition C).

Stream Processes and Physical Habitat Structure

222. Stream processes are defined as the hydrologic, bed-load sediment, and large woody debris regimes of a particular stream reach and is a term used to describe stream channel hydraulics, or the erosion, deposition, sorting, and distribution of instream materials by the power of flowing water. Stream processes work toward an equilibrium condition, are governed by flow characteristics, stream morphology, channel roughness, and floodplain connectivity and, in part, determine physical habitat structure and aquatic habitat quality (Standards § 29A-102 (43)).

223. Physical habitat structure is defined as the diverse combination and complexity of

instream forms created within substrate and woody debris on and within the bed and banks of the channel by stream processes and flow characteristics. Physical habitat structure, in part, determines aquatic habitat quality at the stream reach and stream network scales by providing for all life cycle functions, which include the full set of forms necessary for the provision of and access to cover, overwintering, and temperature refuge and the substrates necessary for feeding and reproduction of aquatic biota and wildlife (Standards, § 29A-102 (33)).

224. Stream processes, including erosion, are a naturally occurring and ongoing process in river systems, particularly in working toward an equilibrium condition.

Protection and Support of Life Cycle Functions

225. The Applicant proposes to provide whitewater releases into the bypassed reach while minimizing flow fluctuations downstream of the Project. The Applicant is proposing to provide up to six (6) whitewater releases at the Project following ramping requirements. Three of those releases would be scheduled in advance, and the additional three (3) releases would be scheduled opportunistically depending on flow availability. The Applicant is also proposing to ramp flows to limit downstream flow fluctuations, details of which are in Findings 60 to 63.

226. Due to the hydrology of the Missisquoi River, the most consistent time of year there is enough water to provide whitewater boating opportunities is in the spring. The lower Missisquoi River has resident fish species moving in from Lake Champlain for spawning (Finding 129). Additionally, there are spring spawning fish in other reaches of the Missisquoi River.

227. To assess the effectiveness of the Applicant's ramping proposal, they conducted an assessment to determine the water level fluctuation downstream of the Project (Findings 132 to 136 and Table 13). The results indicated that under low ramp scenarios water levels change about 7 inches to 1.5 inches depending on the location. Under high flow scenarios, water levels change a little less than 3 inches to around 2.5 inches. In the reaches below Swanton Dam the minimum and maximum elevation change are 1.56 and 2.52 inches respectively.

228. There is a change in water level in the areas downstream of Swanton Dam. This may occur three (3) to six (6) times a year. Additionally, the greatest level of water change, approximately 2.5 inches, occurs when flows in the Missisquoi River are greater than 4,000 cfs. Fish species at this point are experiencing a high flow event, which are typical of the spring, and have likely already sought habitat protective of events like these.

229. The Proposal by the Applicant to provide whitewater releases as proposed will be protective of life cycle functions and aquatic habitat in the reaches below the Project. Therefore, this Certification is conditioned (Condition F) on the adoption of the Applicant's proposal to provide whitewater releases using a ramping procedure to minimize changes in flow fluctuations and surface water levels in the riverine reach below the Project.

D. Wildlife and Wetlands

230. The Applicant is proposing to operate the Project in an instantaneous run-of-river mode and proposes to continue this operating mode. The Applicant's proposal will minimize fluctuations in impoundment levels and downstream flows when inflow is within the capacity of the Project. Therefore, it is not anticipated that continued operation of the Project will adversely affect wildlife or wetlands.

E. Rare, Threatened, and Endangered Species

231. The Applicant as part of the relicensing process conducted an inventory of potential rare, threatened, and endangered species. The studies included a mussel study (Findings 100 and 101) and a rare plant inventory (Findings 150 - 157).

Northern Long-eared Bat and Tricolored Bat

232. The Northern long-eared bat is listed at both the state and federal level as endangered. The Tricolored bat is listed as endangered in the state of Vermont. There are no known occurrences of either species in the Project area. The Applicant has not indicated a need for tree clearing activities. To avoid impacts to potential hibernacula, if tree clearing is needed, it is recommended that it be limited to the winter season for trees that are 3-inches in diameter at breast height or larger. As such, the Agency is conditioning this Certification to include a limitation of the timeframe under which tree clearing activities can occur for trees that are three (3) inches in diameter at breast height or larger (Condition D).

233. Should the Applicant need to cut trees that are three (3) inches in diameter at breast height or larger outside of the allowed timeframe, the Applicant shall first consult with the Vermont Department of Fish and Wildlife and the U.S. Fish and Wildlife Service.

Cylindrical Papershell Mussel

234. There were a number of mussel species located in the Project impoundment. Of particular interest are the State listed Cylindrical Papershell. It was noted after reviewing the study report that the Sheldon Springs impoundment may contain one of the highest densities of these endangered species in Vermont.

235. The Applicant is proposing to operate the Project in a run-of-river mode year-round, which will limit water level fluctuations and thus potential impacts to the species to maintenance activities that require an impoundment drawdown. To limit those impacts the Applicant is proposing to refill the impoundment using 10 percent of inflow with the remaining being provided downstream in addition to consulting with the Department when a maintenance activity requires a drawdown to ensure measures are protective of Cylindrical Papershell.

236. Although the Applicant has proposed mitigation measures, due to the nature of the endangered species population within the impoundment, additional measures are

warranted. In addition to the Applicant consulting on maintenance activities that require a drawdown, this Certification is being conditioned (Condition H) to consult and seek approval for any maintenance activity that requires a drawdown or may result in a discharge to state waters unless otherwise noted in a flow management and monitoring plan.

Botanical Species

237. The Applicant conducted a two year study in the Project area with a goal to identify rare, threatened, or endangered plant species (Findings 150- 157). A number of individual plants were located within the Project area. However, the species of interest identified within the Project area were limited to Meadow Garlic, Marsh Vetchling, and Great St. John's Wort. Additionally, these individual plants were limited to the bypassed reach.

238. The location of the plants of interest coincided with transect locations for the bypass habitat flow study. At all studied flows it is anticipated that none of the plants will become inundated due to the hydraulic complexity of the reach, and the water surface elevation. It is possible however that during high spring flows outside of the Applicant's control, there may be inundation of some individuals. However, these would not be considered Project related effects as these are outside the Applicants maximum hydraulic capacity of the Project.

F. Recreation

239. The Vermont Water Quality Standards require that waters achieve and maintain good quality that fully support boating, fishing, and other designated recreational uses. (Standards, Section 29A-306(d)(3)(A); Standards, Section 29A-306(e)(3)(A); and Standards, Section 29A-306(f)(3)(A)).

240. The Applicant conducted a study that included collecting current information on the recreational amenities at the Project site and consult with recreational users on potential upgrades needed at the facility (Findings 159 - 172).

241. Overall, recreational users noted that they were satisfied with the recreational amenities at the Sheldon Springs Project. Some suggestions were provided during the stakeholder meeting and a number of measures are now proposed by the Applicant.

242. The proposed measures include to seek land rights from WestRock at the upstream portage takeout for the path from the Missisquoi River to Shawville Road. Additionally, the Applicant proposes to remount the "Danger Dam ahead-Portage Here" sign to make it more clear from the takeout area. The Applicant proposes to create two (2) parking spots near the Main Powerhouse. This is located approximately 300 feet upstream of the canoe put-in at the Main Powerhouse tailrace. Signage will also be included for clarity at the parking area. The Applicant is also proposing improvements to the whitewater put-in below the Project dam, and the whitewater take-out near the Mill Buildings. The put-in area will include

rearranging boulders for easier step approaches. At the take-out, the Applicant is proposing to add signage directing boaters to a more gently sloped takeout area a short distance downstream of the current take-out.

243. The Agency supports the Applicant's proposal to improve various recreational measures at the Project. As such, this Certification is conditioned (Condition E) that the Applicant shall implement the proposed recreational enhancements proposed in Finding 242.

Boating

244. For waters classified as Class B(2) for the boating designated use, the management objective is to maintain a level of water quality compatible with good quality boating (Standards, Section 29A-306(d)(3)(A)). The criteria to meet this objective is the applicable hydrology criteria found in the Standards, Section 29A-306(d)(3)(B).

245. In addition to the proposed recreational measures, the Applicant is proposing to provide whitewater boating flows into the bypassed reach. The Applicant proposes to provide whitewater releases into the bypassed reach while minimizing flow fluctuations downstream of the Project by following a ramping procedure. The Applicant is proposing to provide up to six (6) whitewater releases, three (3) of which would be scheduled in advance and the additional three (3) releases would be scheduled opportunistically depending on flow availability.

246. As part of the relicensing the Applicant conducted an on water boating study, which utilized volunteer boaters to assess individual flows (Findings 175- 178). Study flows ranged from 1,200 cfs to 2,100 cfs, and all participants who boated the flows indicated they were either acceptable or totally acceptable, which indicates a wide range of boating opportunities depending on flow. Some participants noted that higher flows may not be acceptable in this reach given their skill level. Some participants also noted a willingness to return to the Sheldon Springs bypassed reach during scheduled flows.

247. The Applicant's proposal to provide whitewater releases into the bypassed reach will support the designated use and existing use of boating in this reach. Additionally, the Applicant's proposal to follow a ramping procedure to provide the boating flows will be protective of aquatic habitat (Findings 225- 229).

248. This Certification is conditioned (Condition F) the adoption of the Applicant's proposal to provide up to six (6) whitewater releases at the Project, with three (3) of which will be scheduled in advance, and three (3) additional releases provided opportunistically, following a ramping procedure.

G. Debris

249. The Applicant did not describe how debris at the Project is managed or disposed of. The Applicant's description of the Project indicates that a flap gate at the Project

dam can be used to flush debris downstream but does not indicate what type of debris (organic or inorganic). The information presented in the Application does not include enough specificity as to how debris is managed. This Certification is conditioned (Condition G) to ensure that debris disposal is consistent with applicable regulations (Finding 11).

H. Aesthetics

250. Aesthetics is a designated use of the Standards. The management objective for waters classified as Class B(2) for aesthetics is “waters shall be managed to achieve and maintain good aesthetic quality” (Standards, Section 29A-306(c)(3)(A)). The Class B(2) criteria for aesthetics use in rivers and streams are “water character, flows, water level, bed and channel characteristics, and flowing and falling water of good aesthetic value.” (Standards, Section 29A-306(c)(3)(B)(i)).

251. The Applicant is proposing to operate the Project in run-of-river mode. Additionally, the Applicant proposes to provide an aesthetic flow of 0.75 inches, or inflow if less, over the flashboards from 7:00 am to 8:00 pm everyday from May 1 to October 1. The priority for providing flows are as follows: if inflow is less than 70 cfs then all units will be shut down and all flows will be spilled over the dam. If inflows are between 70 cfs and 285 cfs, 70 cfs will be provided at the dam followed by an aesthetic flow, with the remaining flow being maintained through Unit 3.

252. As part of the relicensing, the Applicant conducted a spillage study at the dam where three (3) flows were observed: 0.5 inch, 0.75 inch and 1 inch of spillage (Findings 183- 189). The results were summarized by the assessment team in Table 15. Overall, there was agreement that the lower bypassed reach did not vary significantly under each spillage flow, with the assessment concluding that all flows were good, in addition to the sound that was provided by the flowing and falling waters.

253. The area just below the dam, however, differed with different spillages. The consensus table indicated that spillage of 0.5 inches fell into the fair category, 0.75 inches was fair to good, indicating that the flow was nearing adequate under Class B(2) waters. A flow of 1.0 inches was rated as good overall which will satisfy the Standards, Sections 29A-306(c)(3)(A)-(B) for Class B(2) waters.

254. The Applicant is interested in having a varying schedule for flow releases based on season and time of day. Aesthetics is a designated use that must be supported year-round. However, it was noted during the spillage study that the sound provided by the flowing and falling water remained consistently good at flow from 0.5 inches to 1 inch. Therefore, during nighttime hours a flow of 0.5 inches would provide consistently good sound. Lastly, the timeline under which the dam would be visible changes based on the season, therefore the time at which spillage flows can be reduced will vary by day.

255. This Certification is conditioned (Condition B) to provide one (1) inch of spillage over the dam crest for the purpose of providing aesthetic flows year-round during

daytime hours, and 0.5 inches of spill during nighttime hours unless otherwise noted in the flow management and monitoring plan. Daytime hours are defined as one half hour before sunrise to one half hour after sunset.

I. Antidegradation

256. Pursuant to the Anti-Degradation Policy of the Standards (Policy), Section 29A-105 and the Agency's 2010 Interim Anti-Degradation Implementation Procedure (Procedure), the Secretary must determine whether proposed discharges or activity are consistent with the Policy by applying the Procedure during the review of applications for any permit for a new discharge if, during the application review process, compliance with the Standards is evaluated pursuant to applicable state or federal law. (Procedure, Section III(A)). This includes Water Quality Certifications required by Section 401 of the federal Clean Water Act for a federal license or permit for flow modifying activities. (Procedure, Section III(B)(3)).

257. In making a determination that proposed activities are consistent with the Anti-Degradation Policy and Implementation Procedure, the Secretary is required to use all credible and relevant information and the best professional judgement of Agency staff. (Procedure, Section III(D)). Section VIII of the Procedure governs the Agency's review of Section 401 applications for flow modifying activities. (Procedure, Section VIII(A)(1)). The Secretary may have to review a single waterbody under multiple tiers of review depending on whether a waterbody is impaired or high quality for certain parameters.

258. Tier 3 review is required if the project will discharge to an Outstanding Resource Water. (Procedure, Section VIII(D)). This Project does not affect any Outstanding Resource Waters and therefore does not trigger a Tier 3 review under Section VIII of the Procedure.

259. This Project affects waters classified as Class B(2) for all designated uses and criteria, which are presumed to be high quality waters for certain parameters that triggers a Tier 2 review under Section VIII of the Procedure. (Procedure, Section VIII(E)(1)(c)). Under Tier 2, the Secretary must determine whether the proposed discharge will result in a limited reduction in water quality in a high quality water by utilizing all credible and relevant information and the best professional judgment of Agency staff. (Procedure, Section VIII(E)(2)(b)).

260. When conducting a Tier 2 review, the Secretary may consider, when appropriate, any of the following factors when determining if a proposed new discharge will result in a reduction in water quality: (i) the predicted change, if any, in ambient water quality criteria at the appropriate critical conditions; (ii) whether there is a change in total pollutant loadings; (iii) whether there is a reduction in available assimilative capacity; (iv) the nature, persistence and potential effects of the pollutant; (v) the ratio of stream flow to discharge flow (dilution ratio); (vi) the duration of discharge; (vii) whether there are impacts to aquatic biota or habitat that are capable of being detected in the applicable receiving water; (viii) the existing physical, chemical and biological data for the receiving water; (ix) degree of hydrologic or sediment regime

modifications; and (x) any other flow modifications. (Procedure, Section VIII(E)(2)(d)).

261. The Secretary considered the foregoing factors during the review of the Project to determine whether the Project will result in a reduction of water quality in the waters affected by the Project. The principal impacts of the Project are in the reaches of the Missisquoi River affected by the Project and consist of flow and water level management associated with Project operations and the resulting effects on aquatic biota and wildlife and aquatic habitat. The changes in operation of the Sheldon Springs Hydroelectric Project will not result in a discharge of additional pollutants or reduce other ambient water quality criteria. As a result, factors (i), (ii), (iii), (iv), (v), and (vi) are not at issue. Conditions B, C, and H of this Certification, which prescribe flow and water level management regimes and monitoring requirements, are expected to maintain or improve aquatic habitat conditions and reduce the degree of hydrologic alteration associated with operation and maintenance of the facility.

262. This Certification does not authorize any activities that would result in a reduction of water quality for those parameters that exceed the Standards.

263. For those parameters for which waters do not exceed the Standards, the Secretary must conduct a Tier 1 review. (Procedure, Section VIII(F)).

264. When conducting a Tier 1 review, the Secretary may identify existing uses and determine the conditions necessary to protect and maintain these uses. (Procedure, Section VIII(F)). In determining the existing uses to be protected and maintained, the Secretary must consider the following factors: (a) aquatic biota and wildlife that utilize or are present in the waters; (b) habitat that supports existing aquatic biota, wildlife, or plant life; (c) the use of the waters for recreation and fishing; (d) the use of the water for water supply, or commercial activity that depends directly on the preservation of an existing high level of water quality; and (e) evidence of the ecological significance of the use in the functioning of the ecosystem or evidence of the rarity of the use. (Procedure, Section VIII(F)(2)).

265. The Secretary considered the foregoing factors pertinent to a Tier 1 review of the Project. Based on information supplied by the Applicant and Agency staff field investigations, identified the following existing uses in the reaches of the Missisquoi River affected by the Project: aquatic biota and wildlife; aquatic habitat; fishing; canoeing/kayaking-flatwater; canoeing/kayaking- whitewater; and multi-day float trips; recreation; and aesthetics.

266. The existing dam and impoundment have changed the natural condition of the river at the Project location. Currently, aquatic biota and wildlife, aquatic habitat, recreation, canoeing/kayaking- flatwater, canoeing/kayaking- whitewater, and multi-day float trips, and aesthetics are impacted in the Missisquoi River by water level fluctuations within in the impoundment and downstream of the Project and insufficient bypass flows. However, the modifications to the Project conditioned in this Certification will result in improvements to water quality and will protect and maintain existing uses by minimizing deviations from the natural flow regime and

assuring adequate flows in the bypassed reach. These modifications include true run-of-river operations, instituting a bypass flow that supports uses, providing scheduled whitewater releases, and ramping flows during whitewater releases (Conditions B, C, and F). The analysis demonstrates the conditions of the Certification will fully support the existing uses identified in Findings 261 and 265.

267. The Secretary finds that the operation of the Project, as conditioned by this Certification, will comply with the Vermont Water Quality Standards and other applicable rules. Accordingly, the Secretary finds that the Project, as conditioned, meets the requirements of the Policy and Procedure relating to the protection, maintenance, and improvement of water quality.

IV. Decision and Certification

The Department has examined the Project application and other pertinent information deemed relevant by the Department to issue a decision on this certification application pursuant to the Department's responsibilities under Section 401 of the federal Clean Water Act (33 U.S.C. § 1341) and 10 V.S.A. § 1253(h). After examination of these materials, the Department certifies that there is reasonable assurance that operation of the Project, when done in accordance with the following conditions, will not violate Standards; will not have a significant impact on use of the affected waters by aquatic biota, fish or wildlife, including their growth, reproduction, and habitat; will not impair the viability of the existing populations; will not result in a significant degradation of any use of the waters for recreation, fishing, water supply or commercial enterprises that depend directly on the existing level of water quality; and will be in compliance with Sections 301, 302, 303, 306, and 307 of the federal Clean Water Act (33 U.S.C. §§ 1311, 1312, 1313, 1316, and 1317), Section 401, and other appropriate requirements of state law:

A. Compliance with Conditions. The Applicant shall operate and maintain the Project consistent with the findings and conditions of this Certification. The Applicant shall not make any changes to the Project or its operations that would have a significant or material effect on the findings, conclusions, or conditions of this Certification without approval of the Department.

See Finding 192 for a statement of necessity. 10 V.S.A. § 1258, Vt. Code R. 12 030 025 § 29A-101.

B. Flow and Water Level Management. The Project shall be operated in a near instantaneous run-of-river mode. Near instantaneous run-of-river operations means no utilization of impoundment storage and that outflow from the facility is equal to inflow to the impoundment on a near instantaneous basis except for short term, unavoidable deviations. The Applicant shall provide 155 cfs, or inflow if less, into the upper bypass reach, and 255 cfs, or inflow if less, into the lower bypassed reach year-round. This flow shall not be interrupted. When generating the Project shall spill one (1) inch in daylight house and 0.5 inches during nighttime hours continuously year-round in the bypass reach, unless otherwise indicated in the flow management and monitoring plan (Condition C). Daylight hours are defined as one half hour before sunrise to one half hour after sunset. When the Project is not operating, all flow shall be spilled at the dam.

See Findings 193-200, 213-221, 230, and 250-255 for a statement of necessity. 10 V.S.A. § 1258, Vt. Code R. 12 030 025 § 29A-304, § 29A-306 (b)(3)(B), § 29A-306 (c)(3).

C. Flow Management and Monitoring Plan. The Applicant shall develop, within 180 days of the effective date of the FERC license, a flow management and monitoring plan detailing how the Project will operate in compliance with run-of-river operations, spillage requirements, and bypass flows. The plan shall also include a method for continuous monitoring and reporting outflow releases (e.g. spillage and turbine

discharge) at the Project, impoundment levels, and inflow. The plan shall include provisions for the operations data to be submitted to the Department.

The plan can include details regarding anticipated maintenance activities and the procedures that will be followed on those occasions.

The plan shall include procedures for reporting deviations from prescribed operating conditions to the Department. Reports shall be made within 15 days after a deviation and will include, if possible, the cause, severity, and duration of the deviation, observed or reported adverse environmental impacts from the incident, pertinent data, and measures to be taken to avoid recurrences.

The plan shall be subject to Department approval. The Department reserves the right to review and approve any material changes made to the plan.

See Findings 192, 208, 211- 221 and 251- 255 for a statement of necessity. 10 V.S.A. § 1258, Vt. Code R. 12 030 025 § 29A-304, § 29A-306 (a)(3), § 29A-306 (b)(3)(B), & § 29A-306 (c)(3).

D. Northern Long-eared Bat and Tricolored Bat Protection. The Applicant shall avoid tree trimming and removal of trees 3-inch diameter breast height or greater in the project boundary between April 1st and October 31st to avoid any roost disruption of the Northern Long-eared Bat, except when necessary to protect public safety or respond to emergency conditions. In case of a public safety issue or emergency where tree trimming or removal are required during the seasonal protective period, the Applicant will consult with the Department as soon as practical after conducting the trimming or removal.

See Findings 232 and 233 for a statement of necessity. 10 V.S.A. § 5403.

E. Recreation. In accordance with the Applicant's proposal, the Applicant shall attempt to seek land rights from WestRock at the upstream portage takeout for the path from the Missisquoi River to Shawville Road. The Applicant shall remount the "Danger Dam ahead-Portage Here" sign to make it more clear from the takeout area. The Applicant shall create 2 parking spots near the Main Powerhouse and signage will also be included for clarity of parking area. The Applicant shall provide improvements to the whitewater put-in below the dam, and the whitewater take-out near the Mill Buildings. The put-in area will include rearranging boulders for easier stepped approaches. At the take-out the Applicant shall add signage directing boaters to a more gently sloped takeout area a short distance downstream of the current take-out.

The plan shall be developed in consultation with the Department and include consultation with relevant stakeholders who have a direct interest in the facilities at the Project. The plan shall be subject to review and approval by the Department.

See Findings 239- 243 for a statement of necessity. 10 V.S.A. § 1258, Vt. Code R. 12 030 025 §§ 29A- 306(d)-(f) and 10 V.S.A. § 1421.

F. Boating. The Applicant shall provide whitewater releases into the bypassed reach while minimizing flow fluctuations downstream of the Project. The Applicant shall provide up to six whitewater releases at the Project following ramping requirements. Three of those releases shall be scheduled in advanced and the additional three releases would be scheduled opportunistically depending on flow availability.

The Applicant shall follow the ramping procedure as proposed in findings 61 through 63 of this Certification. The Applicant shall include this ramping procedure as part of the flow management and monitoring plan (condition C).

See Findings 225- 229 and 244- 248 for a statement of necessity. 10 V.S.A. § 1258, Vt. Code R. 12 030 025 § 29A-306 (b)(3)(B), and §§ 29A- 306(d)-(f).

G. Debris Disposal. Debris associated with Project operations shall be disposed of in accordance with the Standards and applicable state laws and regulations.

See Findings 249 and 11 for a statement of necessity. 10 V.S.A. § 1258, Vt. Code R. 12 030 025 § 29A-303(1).

H. Maintenance and Repair Work. The Applicant shall consult with the Department prior to conducting scheduled Project maintenance or repair work that necessitates a deviation from condition B unless otherwise noted and approved in the flow management and monitoring plan. Such maintenance and repair work shall be subject to review and approval by the Department.

See Findings 234- 236 for a statement of necessity. 10 V.S.A § 1258, Vt. Code R. 12 030 025 § 29A-304, § 29A-306 (a)(3), § 29A-306 (b)(3)(B), and 10 V.S.A. § 5403

I. Compliance Inspection by Department. The Applicant shall allow the Department to inspect the Project area at any time to monitor compliance with certification conditions.

See Findings 2 and 190 for a statement of necessity. 10 V.S.A § 1258, Vt. Code R. 12 030 025 § 29A-104.

J. Posting of Certification. A copy of the Certification shall be prominently posted within the Project powerhouse.

See Findings 2 and 192 for a statement of necessity. 10 V.S.A § 1258, Vt. Code R. 12 030 025 § 29A-104(b).

K. Modification of Certification. The conditions of this Certification may be altered or amended by the Department to assure compliance with the Vermont Water Quality Standards and to respond to any changes in classification of management objectives for the waters affected by the Project, when authorized by law, and, if necessary, after notice and opportunity for hearing.

See Findings 2 and 190-192 for a statement of necessity. 10 V.S.A § 1258, Vt. Code R. 12 030 025 § 29A-104(a)(c).

Effective Date and Expiration of Certification

This Certification shall become effective on the date of issuance, and the condition of any certification shall become conditions of the federal permit (33 U.S.C. § 1341(d)). If the federal authority denies a permit, the Certification becomes null and void. Otherwise, the Certification runs for the terms of the federal license or permit.

Enforcement

Upon receipt of information that water quality standards are being violated as a consequence of the Project's construction or operation or that one or more certification conditions has not been complied with, the Secretary, after consultation with the Applicant and notification of the appropriate federal permitting agency, may, after notice and opportunity for a public hearing, modify the Certification and provide a copy of such modification to the Applicant and the federal permitting agency.

Certification conditions are subject to enforcement mechanisms available to the federal agency issuing the license and to the state of Vermont. Other mechanisms under Vermont State law may also be used to correct or prevent adverse water quality impacts from construction or operation of activities for which certification has been issued.

Appeals

Pursuant to 10 V.S.A. Chapter 220, any appeal of this decision must be filed with the clerk of the Environmental Division of the Superior Court within 30 days of the date of the decision. Pursuant to 10 V.S.A. Chapter 220, an aggrieved person shall not appeal this decision unless the person submitted to the Secretary a written comment during the applicable public comment period or an oral comment at the public meeting conducted by the Secretary. Absent a determination of the Environmental judge to the contrary, an aggrieved person may only appeal issues related to the person's comments to the Secretary as prescribed by 10 V.S.A. § 8504(d)(2). The Notice of Appeal must specify the parties taking the appeal and the statutory provision under which each party claims party status; must designate the act or decision appealed from; must name the Environmental Division; and must be signed by the appellant or their attorney. In addition, the appeal must give the address or location and description of the property, project, or facility with which the appeal is concerned and the name of the Applicant or any permit involved in the appeal. The appellant must also serve a copy of the Notice of Appeal in accordance with Rule 5(b)(4)(B) of the Vermont Rules for Environmental Court Proceedings. For further information, see the Vermont Rules for Environmental Court Proceedings, available online at www.vermontjudiciary.org. The address for the Environmental Division is 32 Cherry Street, 2nd Floor, Suite 303; Burlington, VT 05401 (Tel. 802.951.1740).

Dated this 1st day of April, 2026

Julia S. Moore, Secretary
Vermont Agency of Natural Resources

By 

Digitally signed by Kevin Burke
Location: Montpelier, Vermont
Date: 2026.04.01 07:20:02 -04'00'

Kevin Burke, Director
Watershed Management Division

VERMONT

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April 2, 2025

Debbie Anne Reese, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

RE: Sheldon Springs Hydroelectric Project – FERC Project No. 7186-054
Section 401 Water Quality Certification

Dear Secretary Reese:

The Vermont Agency of Natural Resources (Agency) issued a final Section 401 water quality certification (Certification) for the Sheldon Springs Hydroelectric Project on April 1, 2026. FERC staff contacted the Agency regarding the final Certification as the word “draft” still appeared in the heading. The Agency has removed the word draft from the final Certification issued on April 1, 2026, for clarity.

Sincerely,

Jeff Crocker
Supervising River Ecologist

Attachment 4

Current FERC License

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

LICENSE

Before Commissioners: Raymond J. O'Connor, Chairman; A. G. Sousa, Oliver G. Richard III and Charles G. Stalon.

Missisquoi Associates) Project No. 7186-001

ORDER ACCEPTING SETTLEMENT AGREEMENT AND ISSUING LICENSE (MAJOR)

(Issued November 2, 1984)

On August 1, 1983, Missisquoi Associates (Missisquoi) filed on August 1, 1983, an application for a license under Part I of the Federal Power Act (Act) to construct, operate, and maintain the Sheldon Springs Project No. 7186. The project would be located on the Missisquoi River, a navigable waterway of the United States, 1/ in Franklin County, Vermont.

Notice of the application has been published and comments have been received from interested Federal, State, and local agencies. The State of Vermont was granted intervention. The significant concerns of the intervenor, and commenting agencies are discussed below.

Project Description

The existing project facilities were constructed in 1908 with an installed capacity of 1,000 kW. The proposed project would consist of: (1) a 35.5-foot-high, 283-foot-long concrete overflow dam; (2) installation of 2-foot-high flashboards; (3) a reservoir; (4) a power canal; (5) three penstocks (two existing and one proposed); (6) three powerhouses (two existing and one proposed) containing 7 generating units (one existing and six proposed) with a total capacity of 22,100 kW; (7) three tailraces (two existing and one proposed); (8) a proposed transmission line; and (8) appurtenant facilities. A more detailed project description is contained in ordering paragraph (C).

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Safety and Adequacy

The site was inspected by the New York Regional Office staff. The dam and power canal were found to be in fair and stable condition, and the equipment in the powerhouse was found to be operable and well-maintained. The dam is classified as having a low hazard potential. During flood flows, the dam has essentially no effect on the hydraulic regime of the river and its failure would not increase the hazard to downstream life and property. The spillway capacity is adequate. Stability analysis and past performance indicate that the dam is stable and safe under normal operating conditions and the 500-year flood. It is concluded that the project,

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under the conditions of this license, would be safe and adequate if constructed in accordance with the plans and specifications using sound engineering practices.

Minimum Flows

The Vermont Agency of Environmental Conservation (VAEC) and the U.S. Department of the Interior (Interior) recommended that minimum flows should be maintained for the maintenance of water quality and the protection of fishery resources in the Missisquoi River. Specifically they recommended that: (1) a minimum flow of 70 cubic feet per second (cfs) (adjusted for mill process water withdrawal up to 20 cfs), or instantaneous inflow to the impoundment, if less, be maintained at all times below the dam; (2) a minimum flow of 200 cfs be maintained at the mill tailrace and, if the inflow to the impoundment falls below 270 cfs, the flow in the Missisquoi River below the mill tailrace should be equal to all instantaneous inflows; (3) the recommended minimum flow below the mill tailrace should not include the flow used as mill process water; and (4) a minimum flow of 285 cfs, or instantaneous inflow to the impoundment, if less, be maintained below the proposed powerhouse tailrace. They also stated that flows from the dam and the mill could be used to meet this last requirement. Missisquoi has agreed to maintain the 70, 270, and 285 cfs minimum flows recommended by VAEC and Interior and notes that these flows would conform to the conditions of the state water quality certificate issued, for the project. 2/ Missisquoi also noted that VAEC would consider a reduction in the minimum flow levels if future flow studies indicate insignificant enhancement of the aquatic resources at the recommended flow levels.

2/ VAEC issued a water quality certificate for the project on March 30, 1984.

A minimum flow is necessary to protect the water quality and aquatic resources downstream of the project dam. The minimum flows of 70, 270, and 285 cfs should provide adequate protection for the fishery resources. Additional information is needed to determine if a reduction in the minimum flows could still protect and enhance the water quality and aquatic resources. Article 34 requires the Licensee to conduct studies to determine the flows that are will protect the aquatic habitat below the dam. Article 35 requires the Licensee to maintain interim minimum flows of 70 cfs below the dam, 270 cfs below the mill tailrace, and 285 cfs below the proposed powerhouse tailrace.

Walleye Spawning

The VAEC stated that the 5,000-foot-long river section between the dam and the proposed powerhouse tailrace contains potential spawning habitat for several fish species including walleye. The VAEC also indicated that walleye sucessfully spawn in downriver sections of the Missisquoi River but past operation of the Sheldon Springs Dam has limited spawning potential in the 0.5-mile-long bypass reach from the dam to the mill tailrace. Interior stated that walleye are proposed to be stocked in the impoundment of the downstream Highgate Falls Project (FERC No. 2547) and would be expected to spawn below the Sheldon Springs Dam in the future. Accordingly, both the VAEC and Interior recommended that the Applicant release a minimum flow of 700 cfs, or instantaneous inflow to the impoundment, if less, below the mill tailrace from April 1 through May 31 for the enhancement of walleye spawning. The flow would be released when required by the Vermont Department of Fish and Game (DFG). Although Interior stated that fish passage facilities would not be needed at the project at this time, Articles 15 and 16 would provide for future fish passage facilities, after notice and opportunity for hearing, if required.

Missisquoi stated that walleye are not present in the reach of the river that would be affected by the project and that DFG has not developed a walleye fishery management plan for the project area. However, Missisquoi stated that it would cooperate with the DFG in its efforts to develop a walleye fishery in the area, and therefore would agree to release 700 cfs below the mill tailrace during the months of April and May. Missisquoi indicated that the VAEC would only require 700 cfs when walleye have begun to use the project area for spawning. Upon completion of a cooperative study with the VAEC, both the recommended minimum flow level and duration could be altered.

The resource agencies' proposed program to improve walleye spawning habitat below the Sheldon Springs Dam, concurrent with the initiation of walleye stocking in the impoundment of the downstream Highgate Falls Project, should be implemented. The higher flow releases at the proposed facilities during April and May (when required) would enhance walleye spawning habitat in this section of the river. However, based on available information, an appropriate long-term flow level for this purpose cannot be set at this time. Therefore, Article 36 requires Missisquoi to prepare a study plan to determine the appropriate flow and duration in order to protect and enhance walleye spawning habitat and requires Missisquoi to release a minimum flow of 700 cfs, or instantaneous inflow, if less, during April and May, if requested, until the Commission determines the appropriate final minimum flow release.

Erosion Control

VAEC recommended that Missisquoi prepare a comprehensive erosion control plan to minimize erosion, sedimentation, and reduction in water quality associated with the project construction and operation. VAEC further recommended that the plan include temporary and permanent measures to limit the discharge of sediment into state waters during construction and operation of the project. Missisquoi did not provide a detailed description of erosion control techniques in its application; however, it has agreed to develop such a plan in cooperation with VAEC.

An erosion control plan would be warranted because of the significant run-off and erosion potential on the steep slopes where penstock and transmission line construction would occur. The plan is also necessary to minimize increased turbidity and sedimentation related to those facilities constructed within the stream. Therefore, Article 37 requires Missisquoi, after consultation with the appropriate agencies, to develop an erosion control plan and file it with the Commission prior to the commencement of project construction.

Cultural Resources

The State Historic Preservation Officer (SHPO) reviewed the project and gave it clearance with regard to cultural resources, provided that a proposed access road is located in such a way as to avoid site VT-FR-158. The SHPO also requested an opportunity to review and approve final design plans for the access road. Upon review of an addendum to Missisquois' cultural resources report, the SHPO identified one additional site, VT-FR-160, and two clusters of cultural debris which may be eligible for inclusion in the National Register of Historic Places. The SHPO recommended that

these four potentially significant resources be avoided during project construction and operation. The SHPO further stated that it would review the final management plan and then issue a determination of effect.

The Advisory Council on Historic Preservation (ACHP) has reviewed the project and has issued a "no effect" determination, provided that additional testing of alternative road plans shows no cultural remains. The ACHP also recommended that, when access road plans are more specific, Missisquoi should consult with the SHPO to determine the necessity for, and scope of, additional testing.

Missisquoi has proposed the following plan to mitigate any possible adverse effects to the sites: (1) submission of an addendum to the archeological report dated July 1983, in which the final plans for the placement of the access road in order to avoid site VT-FR-158 would be outlined; and (2) requesting a letter of concurrence from the SHPO with regard to the acceptability of the final plans for the placement of the access road. Missisquoi has stated that final design plans would be developed in consultation with, and approved by, the SHPO.

It is concluded that any impacts resulting from construction activity on sites VT-FR-158 and VT-FR-160, in addition to the two prehistoric use areas, could be sucessfully avoided if the access road is placed to avoid the sites. In an effort to realize complete mitigation/avoidance of cultural resources located within the project area, Article 38 provides for consultation between Missisquoi and the SHPO with regard to final placement of the access road and future management plans.

Recreational Resources

VAEC noted that while the project site is not presently used for white-water boating or fishing because of limited access to the area and lack of water in the river section from the dam to the existing mill discharge, it has good potential for white-water boating. VAEC has recommended that any license issued contain a condition requiring Missisquoi to cooperate with organized recreational clubs to arrange for access to, and suitable flow releases for, white-water boating.

The Appalachian Mountain Club (AMC) stated that the river reach below the dam could become a valuable white-water rafting area, should access be made available to the public. AMC recommended that Missisquoi provide access without limitation or restriction, and that agreements be negotiated to provide sufficient water levels at appropriate times in the 0.5-mile-long bypass reach to allow for white-water recreational purposes.

Interior noted that there is potential for additional white-water canoeing opportunities and recommended that these be explored in consultation with State and local canoeing interests.

Missisquoi responded to these concerns by stating that it would support fishing and hiking by developing improved access across its property. Missisquoi also stated that its proposed continuous discharge from the project dam would be an improvement to the recreational fishery of the area since almost all flows are presently diverted through the existing mill from June to September. Missisquoi offered to allow kayaking and white-water boating during times of excess spillage (estimated to be about 60% of the time in April and 20% in May) and study the possibility of providing access across its property for this use. Missisquoi has proposed to provide a canoe portage around the dam and mill to bypass the whitewater reach below the dam but it did not propose additional flow releases for whitewater boating.

On July 10, 1984, Missisquoi filed with the Commission an Offer of Settlement consisting of a Settlement Agreement executed between Missisquoi and the State of Vermont concerning recreational issues related to the project. This proposed agreement provides for whitewater boating use of the reach beginning at the base of the project dam. The agreement, among other things, requires that Missisquoi: (1) provide access and takeout facilities at the base of the dam and upstream of the proposed tailrace, respectively; (2) provide a 24-hour telephone message service regarding flow conditions at the dam; (3) cooperate with paddling groups to determine the optimum flows for open and closed boats, and provide the optimum flows for a maximum of 6 scheduled weekend days per year up to a

maximum of 200,000,000 cubic feet of water released for recreational purposes per year; and (4) allow access for paddlers on all days regardless of whether the scheduled flows for recreational purpose are being released. 3/

Based on our review of the Settlement Agreement and the record in this proceeding, we conclude that the Settlement Agreement represents a fair and reasonable resolution of all recreational issues raised in this proceeding, is in the public interest, and should be approved and made a part of this license. The Commission's approval of this settlement agreement does not constitute approval of, or precedent regarding, any principle or issue addressed by that agreement. Because certain studies are required to fulfill the provisions of the agreement, Article 39 requires Missisquoi to file for Commission approval a Report on Recreational Resources within 2 years from the date of issuance of the license.

Land Management and Aesthetics

The State Naturalist of the VAEC stated that the project site is unusual and scenically beautiful, especially the stretch of the river with rapids. It contends that dimunition of flows through the bypass reach would subsequently lessen the flows through the boulders and rapids, thus creating a significant impact on visual quality.

VAEC stated that the elevated penstock, as currently proposed, would be a major intrusion at the site and suggested that Missisquoi explore the feasibility of a buried penstock. Although VAEC stated that a thoughtfully-designed elevated penstock could achieve some scenic and visual interest, a buried penstock would be preferable. VAEC recommended that all design plans for the penstock, proposed powerhouse, landscaping, and access road be reviewed by VAEC and filed with the Commission before construction activity is permitted within the project area.

3/ AMC filed comments asserting that the agreement did not sufficiently establish the intent of the parties. Accordingly, AMC requested appropriate modification. Both Missisquoi and the Attorney General filed replies opposing the AMC's request for modification, and supporting the agreement as adequately reflecting the intent of the parties. In light of these replies AMC has withdrawn its request for modification of the Settlement Agreement, and supports its acceptance.

Missisquoi responded that industrial features are prominent either directly on or adjacent to the river for at least 2500 feet of the bypass reach under existing conditions. The reach of the river between the dam and the existing mill remains dry for 50% of the year. Under the proposed project plans, there would be a flow through that reach 100% of the time.

Missisquoi has proposed an elevated penstock crossing that would be located at the upstream end of the visually dominant industrial mill. The Missisquoi has stated that the elevated penstock would pose no additional intrusion to the existing industrial character of the river; however, Missisquoi has agreed to study the feasibility of burying the penstock and would coordinate with the VAEC on this matter.

Missisquoi will submit final engineering drawings to the AEC and file them with the Commission. Missisquoi has also agreed to landscape the disturbed areas around the powerhouse, but stated opposition to the concept of final construction approval being contingent on Commission approval of the visual attributes of the powerhouse design.

We conclude that feasibility studies should be conducted in order to examine the possibility of an alternative design for the elevated penstock. The VAEC's request is reasonable and should not prove inconsistent with construction scheduling. Moreover, such an approval mechanism preserves our discretion to ensure that the completed project is best adapted to a comprehensive plan. A mitigation plan, developed in consultation with the VAEC, could substantially lessen project impacts on the visual quality of the area. Therefore Article 40 requires Missisquoi to consult with the VAEC and conduct feasibility studies for alternative design of the penstock, and Article 41 requires Missisquoi to develop a plan to mitigate any construction impacts on visual resources within the project area.

Finding of No Significant Environmental Impact

Construction of the proposed project facilities would disturb land surfaces and cause temporary increases in sedimentation and turbidity levels in the Missisquoi River. Project operation would affect flows in a 2,200-foot longer reach of the Missisquoi River than is presently affected and would increase the potential for long-term erosion. Approval of the proposed action, with the license articles contained herein, would result in project operation which would provide measures to adequately mitigate impacts on fish, water quality, river flow, historical and archeological resources, recreation resources, and visual quality. No Federally-listed threatened or endangered species would be affected.

On the basis of the record and staff's independent environmental analysis, it is concluded that issuance of a license for the project, as conditioned herein, would not constitute a major Federal action significantly affecting the quality of the human environment. 4/

Economic Feasibility

The project is currently operating run-of-river with an installed capacity of 1,000 kW. After modifications, it will have an installed capacity of 22,100 kW and would generate an average of 67,500,000 kWh annually. 5/ The project is economically feasible based on selling the power at the avoided cost in the State of Vermont adjusted for escalation.

Other Aspects of Comprehensive Development

The project would utilize about 77 percent of the flow of the Missisquoi River at the Sheldon Springs Dam. The average annual plant factor is 36.7 percent. Flows will exceed the hydraulic capacity of the powerplant about 10 percent of the time. The project would make good use of the flow and fall of the Missisquoi River, is not in conflict with any planned or potential development and will be best adapted to the comprehensive development of the Missisquoi River for all beneficial purposes.

License Term and Annual Charge

The proposed construction for this project using an existing dam is similar to the relicensing of an existing licensed project for which a moderate amount of new development is proposed. Therefore, consistent with Commission policy, 6/ this license will terminate on September 30, 2024.

4/ Environmental Assessment, Sheldon Springs Hydroelectric Project FERC Project No. 7186; Vermont; Division of Hydropower Licensing, Office of Electric Regulation, Federal Energy Regulatory Commission (October ___, 1984). This document is available in the Commission's public files associated with this proceeding.

5/ The proposed project would utilize a renewable resource that will save the equivalent of approximately 111,000 barrels of oil or 31,000 tons of coal per year.

6/ Village of Lyndonville, 7 FERC ¶ 61,324 (1979).

For a project having no valid (pre-1920) Federal Permit and located on navigable waters, past Commission policy under the Androscoggin rule has been to issue a license effective as of April 1, 1962, or on the date when a Commission finding of navigability has been made, whichever is earlier. 6/ However, because of the 50-year maximum statutory license period, this license is effective September 1, 1974.

In accordance with the order issuing a license for the Shoshone Falls Project 7/ annual charges will be based on the effective date of the license, but this license will also be conditioned upon payment of an amount equivalent to the annual charges that would otherwise have been due for the period from April 1, 1962 to September 30, 1974. This payment is not a penalty, but is intended to place the Applicant as nearly as possible in the same position as similarly situated Licensees who received their license before that change in policy. Article 42 stipulates this payment as well as the Licensee's annual charges.

It is ordered that:

(A) The Settlement Agreement as filed in this proceeding on July 10, 1984, is approved and is incorporated by reference in this license. The Commission's approval of this settlement agreement does not constitute approval of, or precedent regarding, any principle or issue addressed by that agreement.

(B) This license is issued to Missisquoi Associates (Licensee), of Brattleboro, Vermont under Part I of the Federal Power Act (Act), for a period of 50 years, effective October 1, 1974, for the construction, operation, and maintenance of the Sheldon Springs Project No. 7186, located in Franklin County, Vermont, on the Missisquoi River, a navigable water of the United States. This license is subject to the terms and conditions of the Act, which is incorporated by reference as part of this license; to the regulations the Commission issues under the provisions of the Act; and to the terms of the Settlement Agreement as filed in this proceeding on July 10, 1984.

6/ See Public Service Company of New Hampshire, Project No. 2288, 27 FPC 830 (1962).

7/ See Idaho Power Company, 7 FERC ¶61,254 (1979).

(C) The Sheldon Springs Project No. 7186 consists of:

(1) All lands, to the extent of the Licensee's interests in those lands, constituting the project area and enclosed by the project boundary. The project area and boundary are shown and described by a certain exhibit that forms part of the application for license and that is designated and described as:

Exhibit	FERC No. 7186-	Showing
G-1	11	Project Map
G-2	12	Project Map

(2) Project works consisting of: (a) a 35.5-foot-high, 283-foot-long, concrete overflow dam; (b) 2-foot-high flashboards; (c) an impoundment having a surface area of 175 acres, a storage capacity of 750 acre-feet, and a normal water surface elevation of 328 feet NGVD; (d) a canal intake structure; (e) a 750-foot-long, 50-foot-wide, 8-foot-deep power canal; (f) a 6-foot-diameter, 470-foot-long steel penstock off of the power canal; (g) Powerhouse No. 1 containing one generating unit having a capacity of 1,000 kW; (h) a 50-foot-long, 15-foot-wide, 4-foot-deep tailrace; (i) a 140-foot-long, 12-foot-diameter steel penstock off of the power canal; (j) Powerhouse No. 2 having four generating units with a total capacity of 3,300 kW; (k) a 100-foot-long, 30-foot-wide, 8-foot-deep tailrace; (l) a penstock intake structure off the reservoir; (m) a 1,900-foot-long, 13.5-foot-diameter steel penstock; (n) a bifurcation into two 12-foot-long, 8.5-foot-diameter steel penstocks; (o) Powerhouse No. 3 having two generating units with a total capacity of 17,800 kW; (p) a 125-foot-long, 40-foot-wide, 20-foot-deep tailrace; (q) 0.6-kV, 2.4-kV, and 4.16-kV generator leads; (r) the 4.16/46-kV, 15/20/25 MVA three-phase transformer; (s) a 1,500-foot-long, 46-kV transmission line; and (t) appurtenant facilities.

The location, nature, and character of these project works are generally shown and described by the exhibit cited above and more specifically shown and described by certain other exhibits that also form a part of the application for license and that are designated and described as:

Exhibit A - entitled "Project Description", pages A-1 to A-16 incorporating the mechanical, electrical and transmission equipment.

Exhibit	FERC No. 7186-	Showing
F-1	1	General Plan, Existing Facilities
F-2	2	Detailed Plan, Existing Facilities
F-3	3	Existing Dam & Canal Intake
F-4	4	Existing Penstock Intake
F-5	5	Existing Turbine-Grinder
F-6	6	Existing Hydroelectric Turbine-Generator
F-7	7	General Plan, Proposed Project Facilities
F-8	8	Profile, Proposed Project Facilities
F-9	9	Proposed Inlet and Outlet Structures
F-10	10	Proposed Powerplant

(3) All of the structures, fixtures, equipment, or facilities used or useful in the operation or maintenance of the project and located within the project boundary, all portable property that may be employed in connection with the project, located within or outside the project boundary, as approved by the Commission, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(D) Exhibits A, F, and G designated in ordering paragraph (C) above, are approved and made a part of the license.

(E) This license is also subject to Articles 1 through 28, except Article 20, set forth in Form L-4 (revised October, 1975) entitled "Terms and Conditions of License for Unconstructed Major Project Affecting Navigable Waters of the United States," attached to and made a part of this license. The license is also subject to the following additional articles:

Article 29. The Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other materials unnecessary for the purposes of the project which result from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operation of the project shall be removed. All clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 30. The Licensee shall submit to the Commission's Regional Engineer and the Director, Office of Hydropower Licensing, one copy each of the final contract drawings and specifications for pertinent features of the project, such as water retention structures, powerhouse, and water conveyance structures, at least 60 days prior to start of construction. The Director, Office of Hydropower Licensing, may require changes in the plans and specifications to assure a safe and adequate project.

Article 31. The Licensee shall review and approve the design of contractor-designed cofferdams and deep excavations prior to the start of construction and shall ensure that construction of cofferdams and deep excavations are consistent with the approved design. At least 30 days prior to start of construction of the cofferdam, the Licensee shall provide to the Commission's Regional Engineer and Director, Office of Hydropower Licensing, one copy of the approved cofferdam construction drawings and specifications and a copy of the letter(s) of approval.

Article 32. The Licensee shall, within 90 days of completion of construction, file for approval by the Director, Office of Hydropower Licensing, revised Exhibits A, F, and G to describe and show the project as-built.

Article 33. The Licensee shall commence construction of project works within 2 years from the issuance date of the license and shall complete construction of the project within 4 years from the issuance date of the license.

Article 34. The Licensee shall, after consultation with the Vermont Agency of Environmental Conservation and the U.S. Fish and Wildlife Service, develop an instream flow study plan for the Sheldon Springs Project on the Missisquoi River to determine: (a) the relationship between project discharges on stream morphology and stability. Within 6 months from the date of issuance of this

order, Licensee shall file, with copies to the agencies consulted, the instream flow study plan, and a schedule for study completion, with the Commission for approval. Documentation of agency consultation on the study plan shall be included in the filing.

Licensee shall conduct the instream flow study as approved by the Commission and in accordance with the schedule. Within 6 months from the date of completion of the study, Licensee shall file, with copies to the agencies consulted, a report on the results of the study, and, for Commission approval, recommendations for minimum flow releases from the project. Documentation of agency consultation on the report and recommendations shall be included in the filing.

Article 35. Licensee shall discharge from the Sheldon Springs Dam, an interim continuous minimum flow of 70 cubic feet per second (cfs) or the inflow to the reservoir, whichever is less, for the purpose of protecting and enhancing aquatic resources of the bypass reach. Licensee shall maintain an interim continuous minimum flow of 270 cfs, as measured immediately below the mill tailrace, or the inflow to the reservoir, whichever is less, for the purpose of protecting and enhancing aquatic resources in the Missisquoi River. In addition to the 270 cfs minimum flow, Licensee shall discharge flows used as mill process water into the river. Further, Licensee shall maintain an interim continuous flow of 285 cfs, as measured immediately below the proposed powerhouse tailrace, or the inflow to the reservoir, whichever is less. These flows may be temporarily modified, if required by operating emergencies beyond the control of the Licensee, for minimum flow studies required by license Article 34, and for short periods, upon mutual agreement between the Licensee and the Vermont Agency of Environmental Conservation.

Additionally, until the Commission determines the final minimum flow release needed for enhancement of the future walleye fishery, the Licensee shall, upon request of the Vermont Agency of Environmental Conservation, release a minimum flow of 700 cfs, or instantaneous inflow to the impoundment, if less, below the mill tailrace from April 1, through May 31.

Article 36. Licensee shall, after consultation with the Vermont Agency of Environmental Conservation and the U.S. Fish and Wildlife Service, develop a study plan to determine the appropriate flow and flow duration for the protection and enhancement of walleye spawning habitat in the Missisquoi River below the Sheldon Springs Project mill tailrace. Further, Licensee shall, within one year from the date of issuance of this license, file for Commission approval, with copies to the consulted agencies, the study plan and a schedule for filing results of the study. Comments from the consulted agencies on the adequacy of the plan and schedule must be included in the filing. The Commission reserves the right to require modification to the plan and schedule.

The results of the study shall be submitted to the Commission according to the approved schedule, along with comments from the consulted agencies related to the results of the study. Further,

the results of the study shall include, for Commission approval, recommendations for a flow and duration to protect and enhance walleye spawning habitat and a schedule for implementing the flow and duration, along with comments from the above agencies on the adequacy of the recommendations. At the same time, copies of the study results shall be served upon the agencies consulted.

Article 37. Licensee shall, after consultation with the Vermont Agency of Environmental Conservation, develop a detailed plan to control erosion, sedimentation, and other pollutants resulting from construction, operation, and maintenance of the project. This plan shall include an implementation schedule, monitoring and maintenance programs for project construction and operation, and evidence of agency consultation. The Licensee shall, within one year from the date of issuance of this license, and 60 days prior to any ground-disturbing activity or spoil disposal at the project, file the plan with the Commission's Regional Engineer in New York City and the Director, Office of Hydropower Licensing The Director, Office of Hydropower Licensing, reserves the right to require changes in the plan.

Article 38. Licensee shall, prior to the commencement of project construction, consult with the Vermont State Historic Preservation Officer (SHPO) to: (1) determine final access road placement in order to avoid archeological site VT-FR-158 and VT-FR-160 and associative prehistoric use areas, as identified in the addendum to the Phase I archeological report; and, (2) conduct further Stage II survey work in proposed alternative areas for access road placement, as these design plans develop; and (3) implement its management plan, dated August 7, 1984, as approved by the SHPO. Reports containing the results of all access road survey work, and mitigation plans addressing the avoidance of cultural resources, along with the written approval of the SHPO, shall be submitted to the Commission for final approval within 30 days of survey completion. If, during the course of construction, it is determined that historical and/or archeological resources will be impacted to a greater extent than is currently expected, at the time of initial consultation between the Licensee and the SHPO, or if any previously unrecorded historical or archeological sites

are discovered during the course of construction or developement of any project works or other facilities at the project, construction activity within the vicinity shall be halted, a qualified historian or archeologist shall be consulted to determine the significance of the sites, and the Licensee shall consult with the SHPO to develop a mitigation plan for the protection of significant resources. If the Licensee and the SHPO cannot agree on the amount of money to be expended on cultural resources work related to the project, the Commission reserves the right to require the Licensee to conduct, at its own expense, any such work found necessary.

Article 39. Licensee shall consult with the Attorney General, State of Vermont, and the Vermont Agency of Environmental Conservation (VAEC) to carry out the provisions of the Settlement Agreement with the State of Vermont concerning whitewater boating use of the reach of the Missisquoi River between the project dam and tailrace. Within 2 years from the date of issuance of this license, Licensee shall file with the Commission, for approval by the Director of Hydropower Licensing, a Report on Recreational Resources for the project that shall include, but not be limited to: (1) a description and location of facilities for boating use of the Missisquoi River to be provided by Licensee; (2) measures to be implemented for public notification of whitewater boating conditions at the project; (3) the amount and schedule of flow releases for recreational purposes; (4) a schedule for construction of recreational facilities; and (5) a statement concerning maintenance and operation responsibilities for the recreational facilities. Copies of the report shall be provided to the VAEC and other cooperating parties at the time it is filed with the Commission.

Article 40. Licensee shall, within four months from the date of the issuance of this license, and after consultation with the Vermont Agency of Environmental Conservation (VAEC), conduct a study of the economic and engineering feasibility of alternative penstock configurations, including subsurface locations and/or treatments that would minimize any adverse impact of the penstock on existing visual quality in the project area. The Licensee shall, within six months from the date of issuance of this license, file a report with the Director, Office of Hydropower Licensing on the results of that study, including the comments and recommendations of the VAEC, as well as the recommendations of the Licensee. The Commission reserves the right to require modifications to the recommended configurations and treatments of the penstock to mitigate impacts to the existing visual quality in the project area.

Article 41. Licensee shall, in consultation and cooperation with the Vermont Agency of Environmental Conservation (AEC), develop a plan to avoid or minimize any impacts caused by construction, operation, and maintenance of the project works to the existing visual quality of the project area, to include blending project works with existing landscape characteristics, revegetating, stabilizing, and landscaping any construction areas located outside the area of the project reservoir. The Licensee shall, within one year from the date of issuance of this license, and 90 days prior to the commencement of any construction, provide this plan with the Director, Office of Hydropower Licensing. The Commission reserves the right to require modifications to the plan.

Article 42. The Licensee shall pay the United States the following amounts for the purpose of reimbursing the United States for the cost of administration of Part I of the Act:

(1) For the period from April 1, 1962, through September 30, 1974, an amount equal to the full annual charge that would have applied for the period if the project had been licensed during that period. The authorized installed capacity for this purpose is 1,300 horsepower.

(2) For the period from October 1, 1974, through September 30, 1984, the full annual charge ordinarily due in accordance with the Commission's regulations. The authorized installed capacity for this purpose is 1,300 horsepower.

(3) From October 1, 1984, the full annual charge computed in accordance with the Commission's regulations in effect from time to time. The authorized installed capacity for this purpose is 29,460 horsepower.

Article 43. Pursuant to Section 10(d) of the Act, after the first 20 years of operation of the project under license, a specified reasonable rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. One half of the project surplus earnings, if any, accumulated after the first 20 years of operation under the license, in excess of the specified rate of return per annum on the net investment, shall be set aside in a project amortization reserve account at the end of each fiscal year. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year after the first 20 years of

operation under the license, the amount of that deficiency shall be deducted from the amount of any surplus earnings subsequently accumulated, until absorbed. One-half of the remaining surplus earnings, if any, cumulatively computed, shall be set aside in the project amortization reserve account. The amounts established in the project amortization reserve account shall be maintained until further order of the Commission.

The annual specified reasonable rate of return shall be the sum of the annual weighted costs of long-term debt, preferred stock, and common equity, as defined below. The annual weighted cost for each component of the reasonable rate of return is the product of its capital ratio and cost rate. The annual capital ratio for each component of the rate of return shall be calculated based on an average of 13 monthly balances of amounts properly includable in the Licensee's long-term debt and proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rates for long-term debt and preferred stock shall be their respective weighted average costs for the year, and the cost of common equity shall be the interest rate on 10-year government bonds (reported as the Treasury Department's 10 year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Article 44. (a) In accordance with the provisions of this article, the Licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain other types of use and occupancy, without prior Commission approval. The Licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the Licensee shall also have continuing responsibility to supervise and control the uses and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the Licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the Licensee shall take any lawful action

necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The types of use and occupancy of project lands and waters for which the Licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time where said facility is intended to serve single-family type dwellings; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the Licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The Licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the uses and occupancies for which it grants permission are maintained in good repair and comply with applicable State and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the Licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the Licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the Licensee's costs of administering the permit program. The Commission reserves the right to require the Licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The Licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary State and Federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and

electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the Licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The Licensee may convey fee titles to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary State and Federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary Federal and State water quality certificates or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary Federal and State approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from the edge of the project reservoir at normal maximum surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 45 days before conveying any interest in project lands under this paragraph (d), the Licensee must file a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G or K map may be used), the nature of the proposed use, the identity of any Federal or State agency official consulted, and any Federal or State approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the Licensee to file an application for prior approval, the Licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraphs (c) or (d) of this article:

(1) Before conveying the interest, the Licensee shall consult with Federal and State fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the Licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources of an Exhibit E; or, if the project does not have an approved Exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include covenants running with the land adequate to ensure that: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project.

(4) The Commission reserves the right to require the Licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary

circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G or K drawings would be filed for approval for other purposes.

(E) Within 90 days from the issuance date of this license, the Licensee shall file a statement under oath showing the gross amount of power generation for the project in kilowatt-hours for each calendar year commencing April 1, 1962, in accordance with the provisions of Section 11.20(a)(4) of the Commission's regulations.

(F) The Licensee's failure to file a petition appealing this order to the Commission shall constitute acceptance of this license. In acknowledgment of acceptance of this order and its terms and conditions, it shall be signed by the Licensee and returned to the Commission within 60 days from the date this order is issued.

By the Commission.

(S E A L)

Kenneth F. Plumb

Kenneth F. Plumb,
Secretary.

Project No. 7186-001

IN TESTIMONY of its acknowledgment of acceptance of all of the terms and conditions of this order, Missisquoi Associates, this _____ day of _____, 1984, has caused its name to be signed hereto by _____ its President, and its corporate seal to be affixed hereto and attested by _____ its Secretary, pursuant to a resolution of its Board of Directors duly adopted on the _____ day of _____, 1984, a certified copy of the record of which is attached hereto.

By_____
President

Attest:

_____
Secretary

(Executed in quadruplicate)

Form L-4
(Revised October, 1975)

FEDERAL ENERGY REGULATORY COMMISSION

TERMS AND CONDITIONS OF LICENSE FOR UNCONSTRUCTED MAJOR PROJECT AFFECTING NAVIGABLE WATERS OF THE UNITED STATES

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project works shall be constructed in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Upon the completion of the project, or at such other time as the Commission may direct, the Licensee shall submit to the Commission for approval revised exhibits insofar as necessary to show any divergence from or variations in the project area and project boundary as finally located or in the project works as actually constructed when compared with the area and boundary shown and the works described in the license or in the exhibits approved by the Commission, together with a statement in writing setting forth the reasons which in the opinion of the Licensee necessitated or justified variation in or divergence from the approved exhibits. Such revised exhibits shall, if and when approved by the Commission, be made a part of the license under the provisions of Article 2 hereof.

Article 4. The construction, operation, and maintenance of the project and any work incidental to additions or alterations shall be subject to the inspection and supervision of the Regional Engineer, of the Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of the project and for any subsequent alterations to the project. Construction of the project works or any feature or alteration thereof shall not be initiated until the program of inspection for the project works or any such feature thereof has been approved by said representative. The Licensee shall also furnish to said representative such further information as he may require concerning the construction, operation, and maintenance of the project, and of any alteration thereof, and shall notify him of the date upon which work will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction, maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights of occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. In the event the project is taken over by the United States upon the termination of the license as provided in Section 14 of the Federal Power Act, or is transferred to a new licensee or to a non-power licensee under the provisions of Section 15 of said Act, the Licensee, its successors and assigns shall be responsible for, and shall make good any defect of title to, or of right of occupancy and use in, any of such project property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: Provided, That the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the United States or to a new licensee, to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the Licensee.

Article 7. The actual legitimate original cost of the project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

Article 8. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may be mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 9. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 10. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

Article 11. Whenever the Licensee is directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States, the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.

Article 12. The United States specifically retains and safeguards the right to use water in such amount, to be determined by the Secretary of the Army, as may be necessary for the purposes of navigation on the navigable waterway affected; and the operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Secretary of the Army may prescribe in the interest of navigation, and as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Secretary of the Army may prescribe in the interest of navigation, or as the Commission may prescribe for the other purposes hereinbefore mentioned.

Article 13. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 14. In the construction or maintenance of the project works, the Licensee shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the Licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the Licensee from any responsibility or requirement which may be imposed by any other lawful authority for avoiding or eliminating inductive interference.

Article 15. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 16. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 17. The Licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped, and shall comply with such reasonable modifications of the project, as may be prescribed hereafter by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal or State agencies, after notice and opportunity for hearing.

Article 18. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 19. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 20. The Licensee shall consult with the appropriate State and Federal agencies and, within one year of the date of issuance of this license, shall submit for Commission approval a plan for clearing the reservoir area. Further, the Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. Upon approval of the clearing plan all clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 21. Material may be dredged or excavated from, or placed as fill in, project lands and/or waters only in the prosecution of work specifically authorized under the license; in the maintenance of the project; or after obtaining Commission approval, as appropriate. Any such material shall be removed and/or deposited in such manner

as to reasonably preserve the environmental values of the project and so as not to interfere with traffic on land or water. Dredging and filling in a navigable water of the United States shall also be done to the satisfaction of the District Engineer, Department of the Army, in charge of the locality.

Article 22. Whenever the United States shall desire to construct, complete, or improve navigation facilities in connection with the project, the Licensee shall convey to the United States, free of cost, such of its lands and rights-of-way and such rights of passage through its dams or other structures, and shall permit such control of its pools, as may be required to complete and maintain such navigation facilities.

Article 23. The operation of any navigation facilities which may be constructed as a part of, or in connection with, any dam or diversion structure constituting a part of the project works shall at all times be controlled by such reasonable rules and regulations in the interest of navigation, including control of the level of the pool caused by such dam or diversion structure, as may be made from time to time by the Secretary of the Army.

Article 24. The Licensee shall furnish power free of cost to the United States for the operation and maintenance of navigation facilities in the vicinity of the project at the voltage and frequency required by such facilities and at a point adjacent thereto, whether said facilities are constructed by the Licensee or by the United States.

Article 25. The Licensee shall construct, maintain, and operate at its own expense such lights and other signals for the protection of navigation as may be directed by the Secretary of the Department in which the Coast Guard is operating.

Article 26. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee

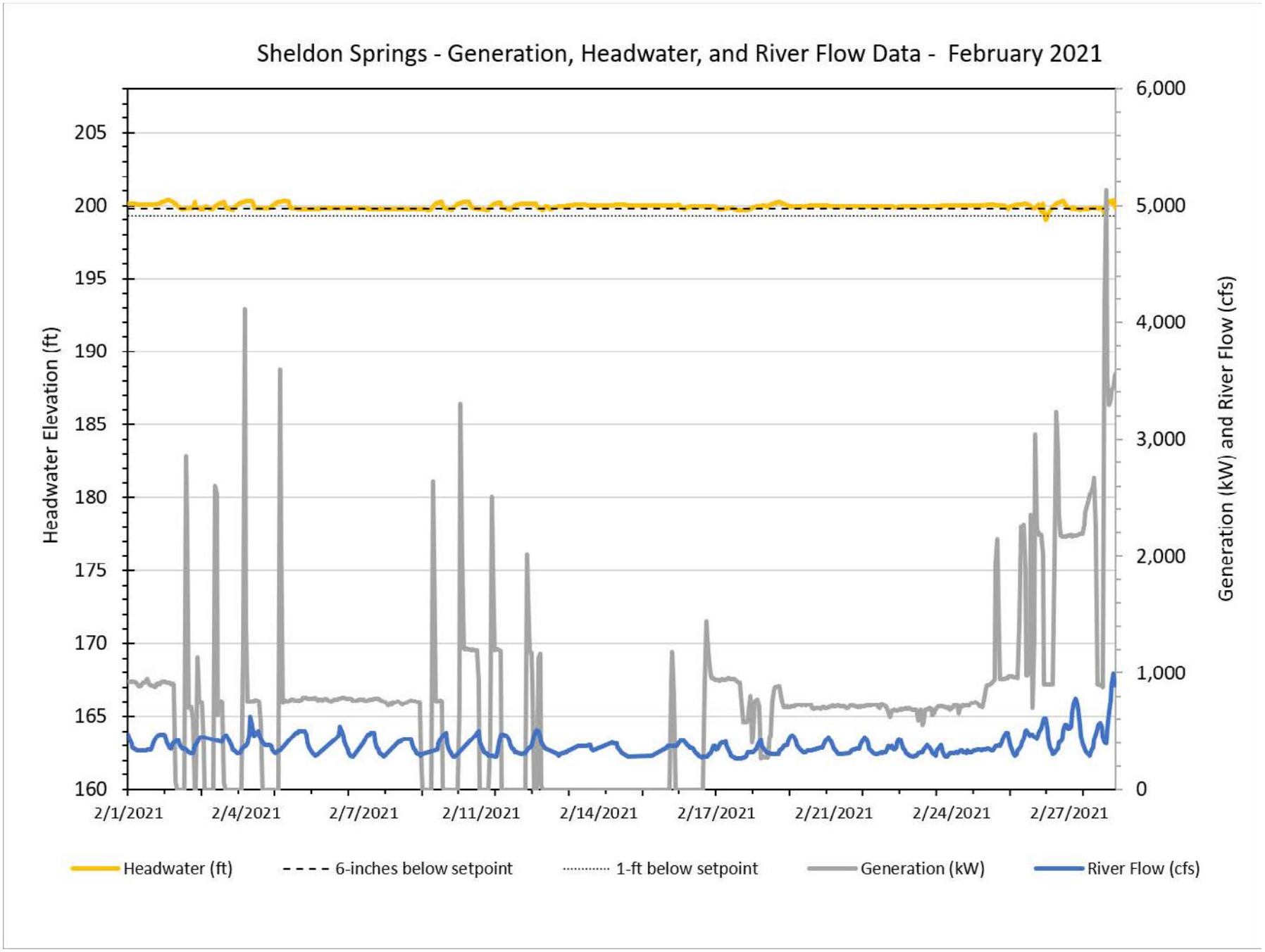
or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

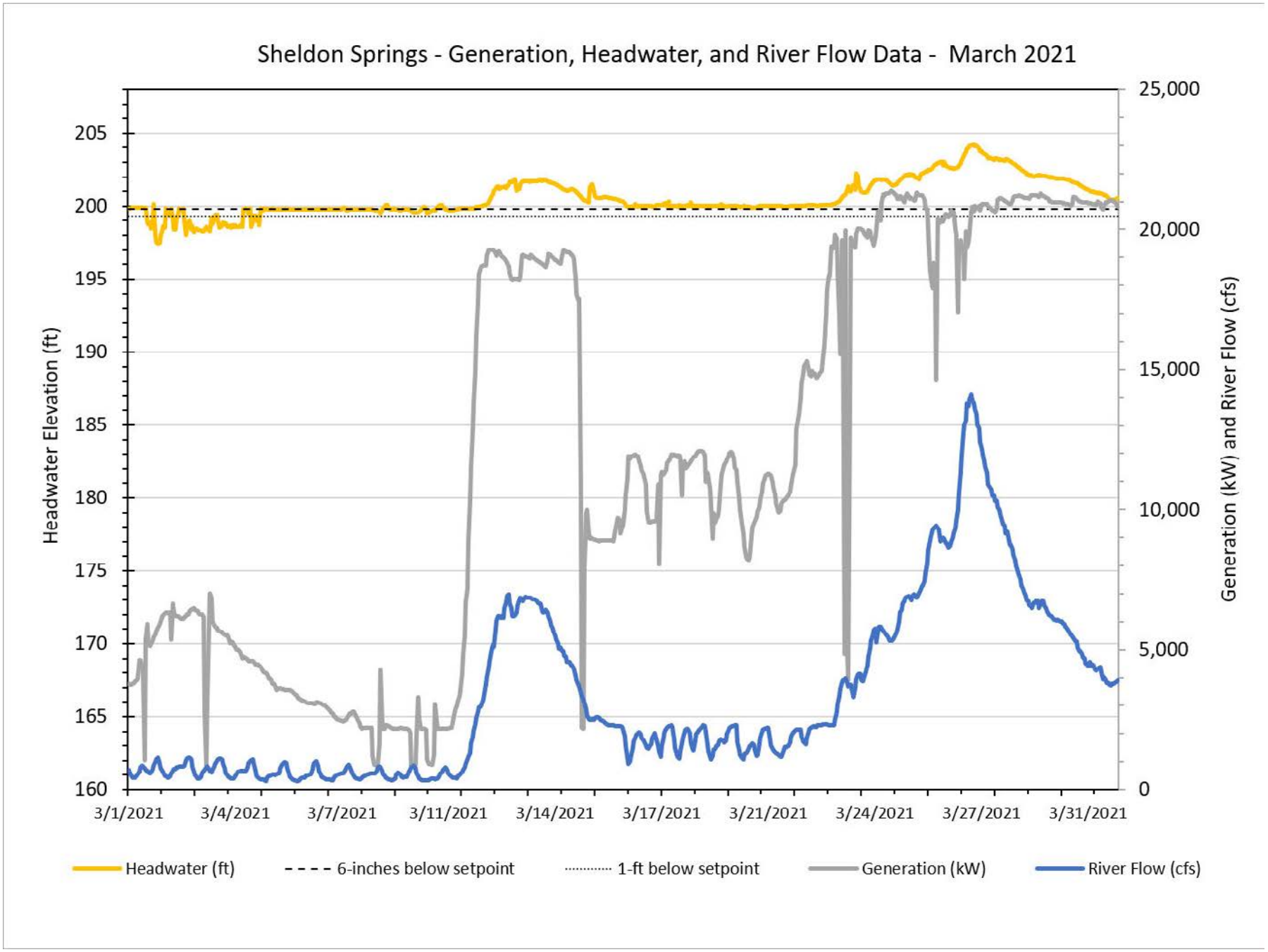
Article 27. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

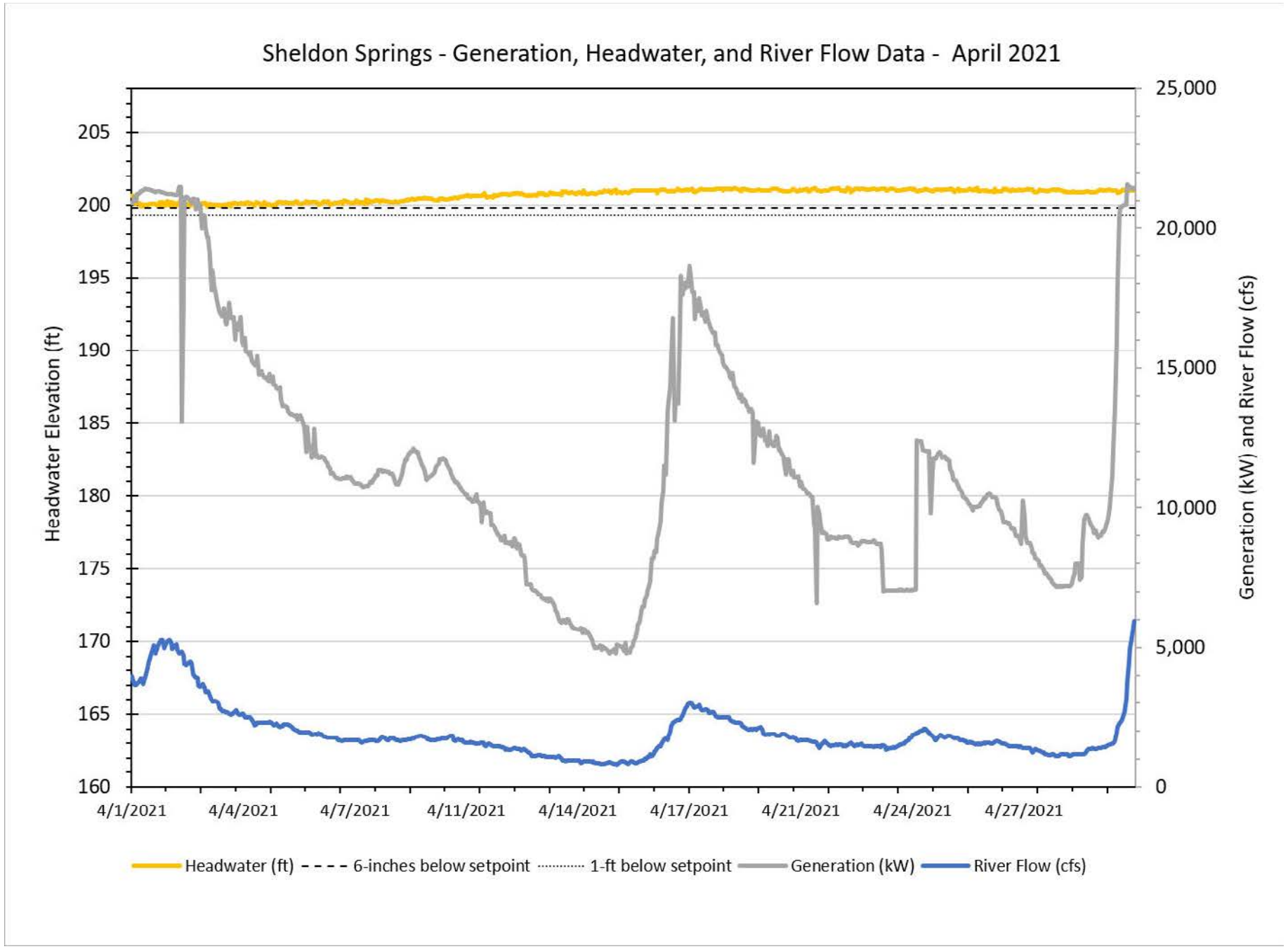
Article 28. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

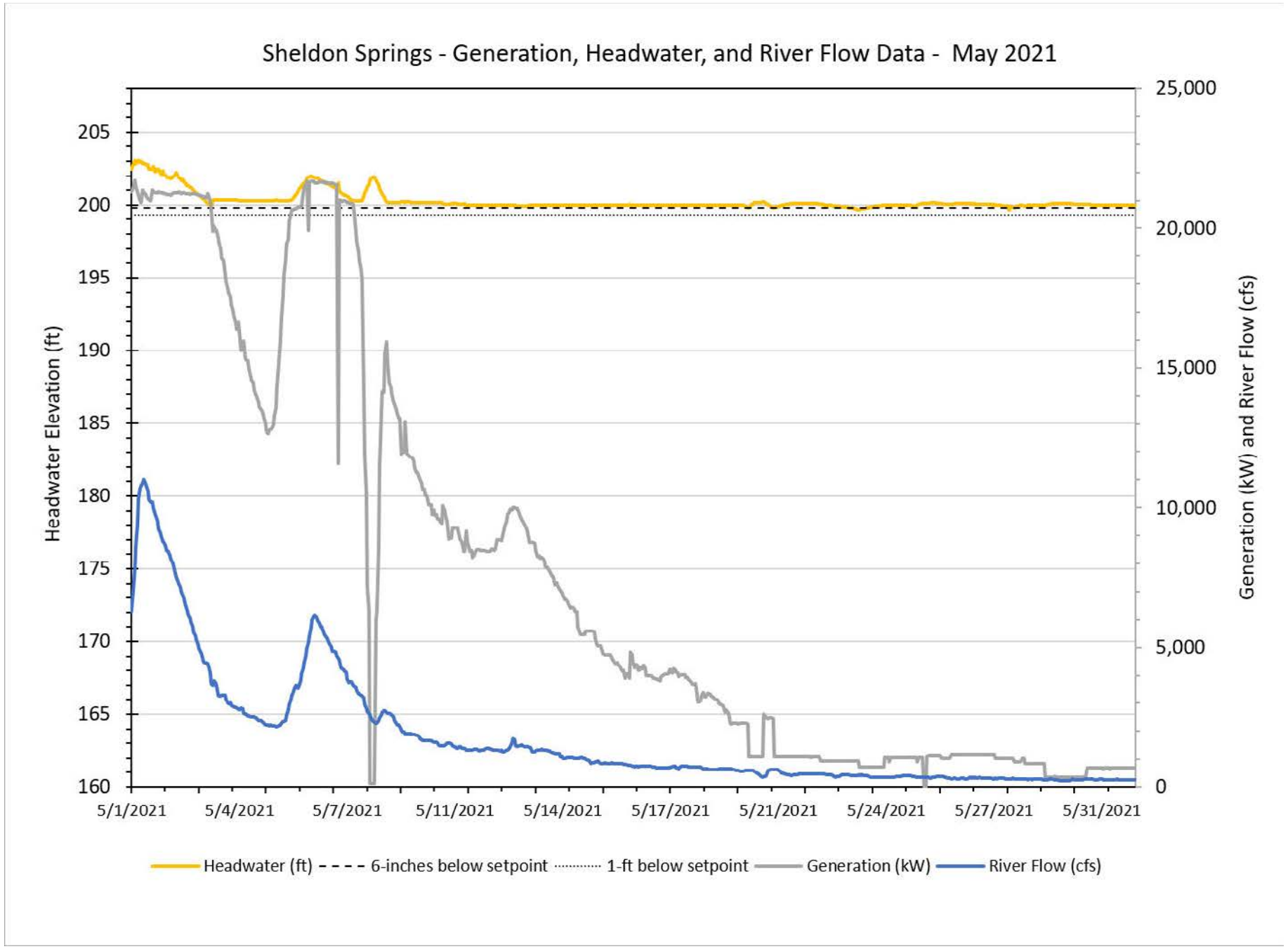
Attachment 5

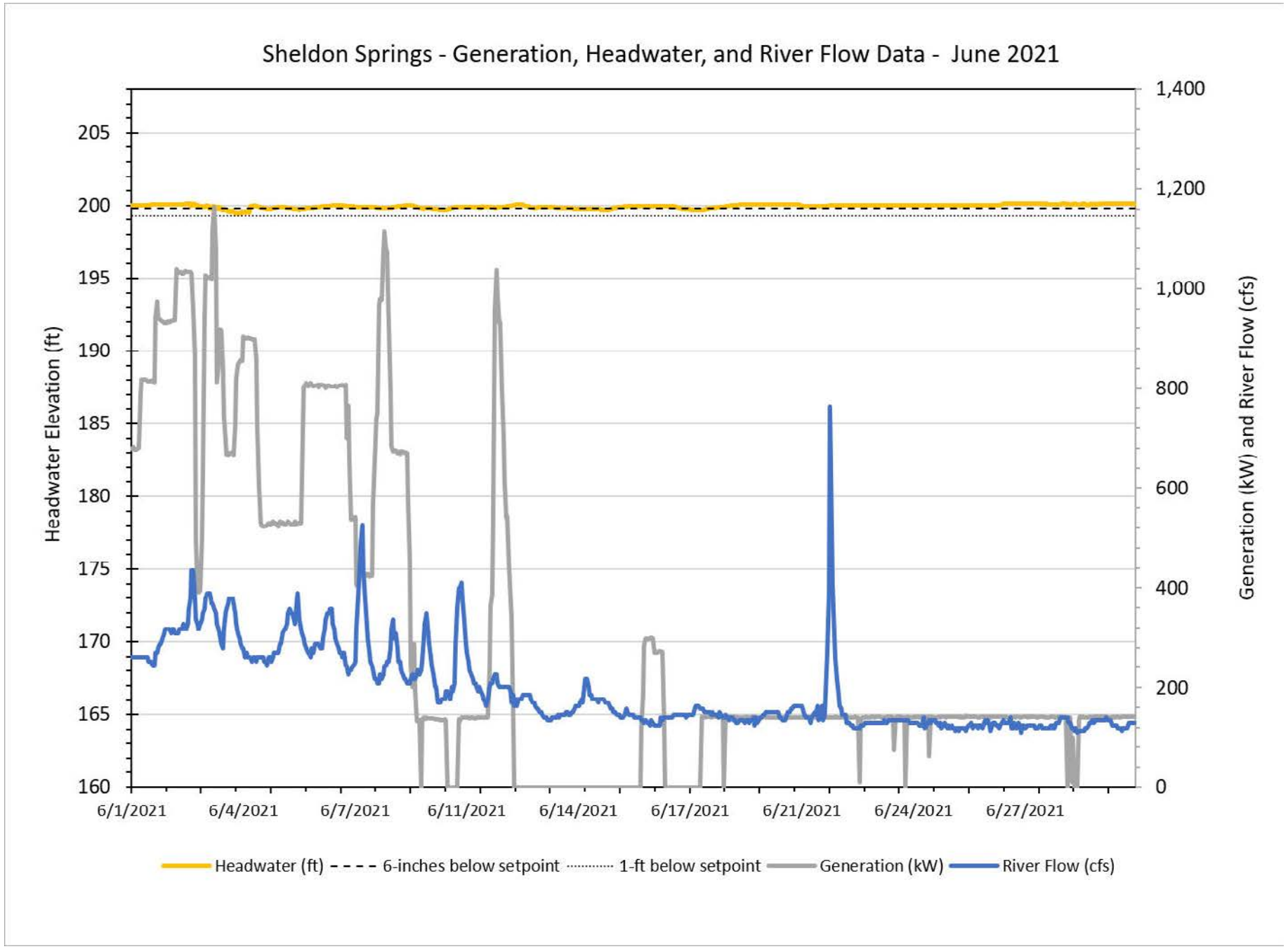
Copy of 12 months of data demonstrating that river inflow equals outflow and river fluctuation levels

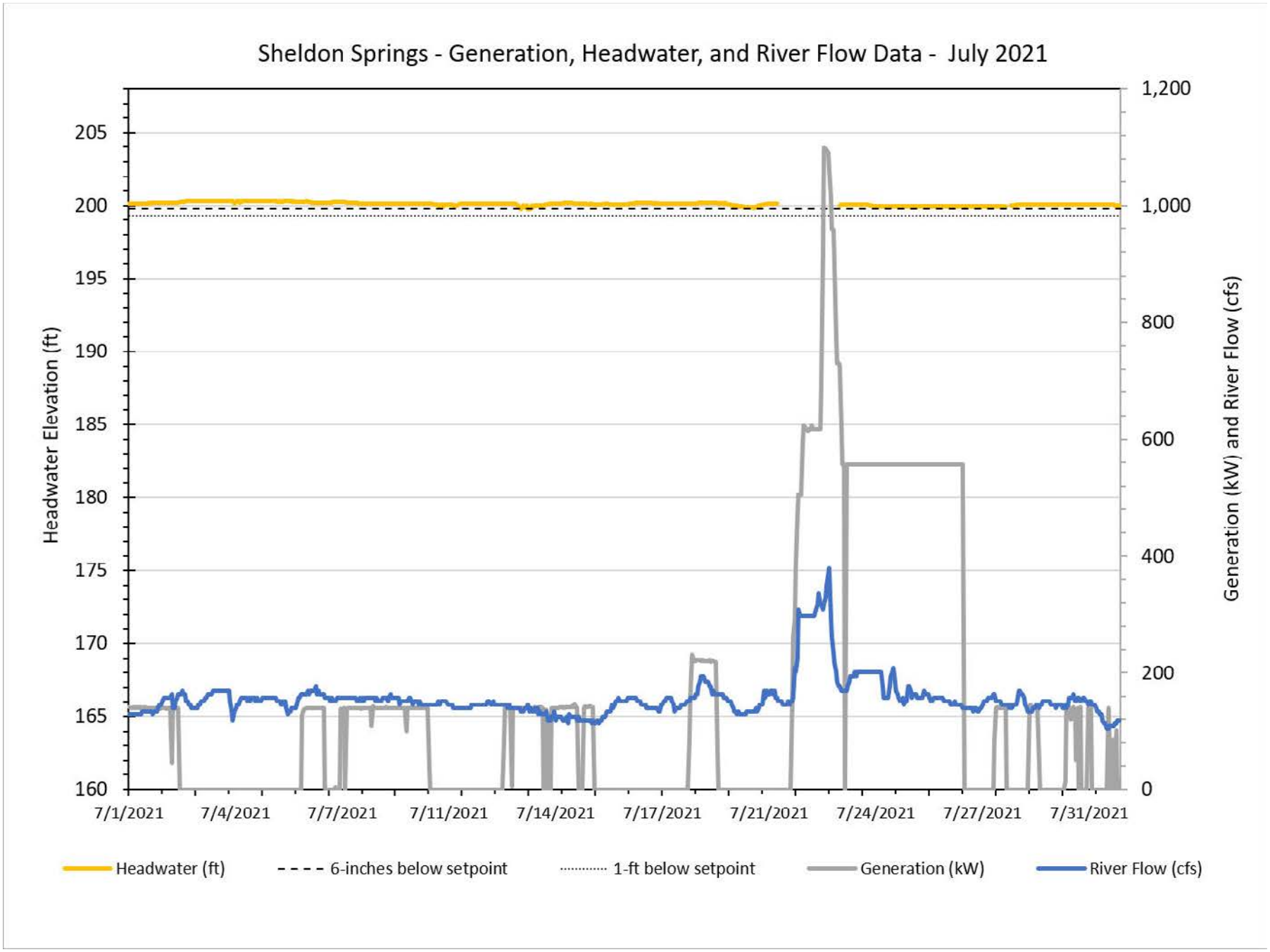

Sheldon Springs - Generation, Headwater, and River Flow Data - February 2021
Headwater Elevation (ft)
205
200
195
190
185
180
175
170
165
160
6,000
5,000
4,000
3,000
2,000
1,000
0
Generation (kW) and River Flow (cfs)
2/1/2021
2/4/2021
2/7/2021
2/11/2021
2/14/2021
2/17/2021
2/21/2021
2/24/2021
2/27/2021
Headwater (ft)
6-inches below setpoint
1-ft below setpoint
Generation (kW)
River Flow (cfs)

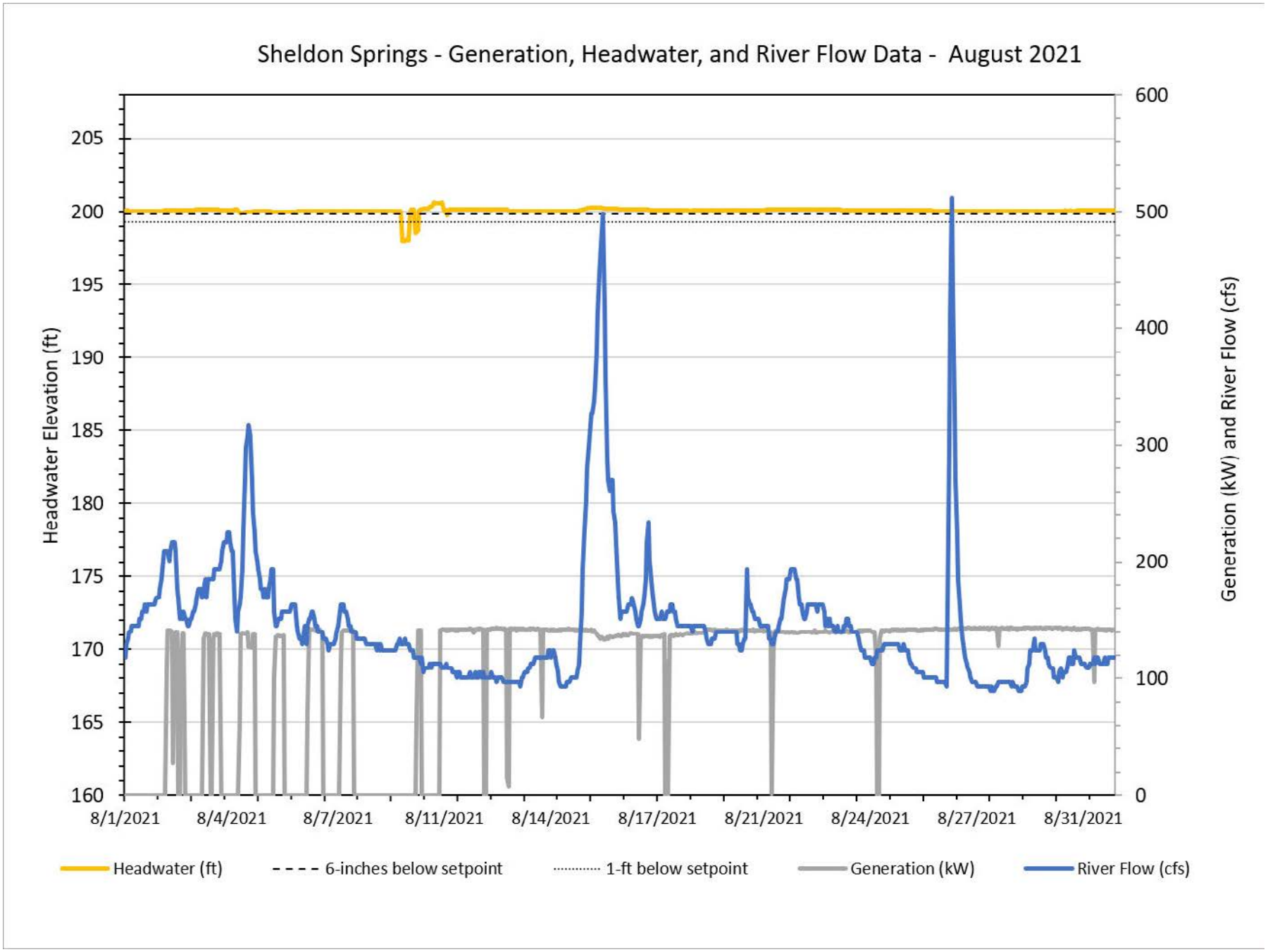

Sheldon Springs - Generation, Headwater, and River Flow Data - March 2021
Headwater Elevation (ft)
Generation (kW) and River Flow (cfs)
205
200
195
190
185
180
175
170
165
160
25,000
20,000
15,000
10,000
5,000
0
3/1/2021
3/4/2021
3/7/2021
3/11/2021
3/14/2021
3/17/2021
3/21/2021
3/24/2021
3/27/2021
3/31/2021
Headwater (ft)
6-inches below setpoint
1-ft below setpoint
Generation (kW)
River Flow (cfs)

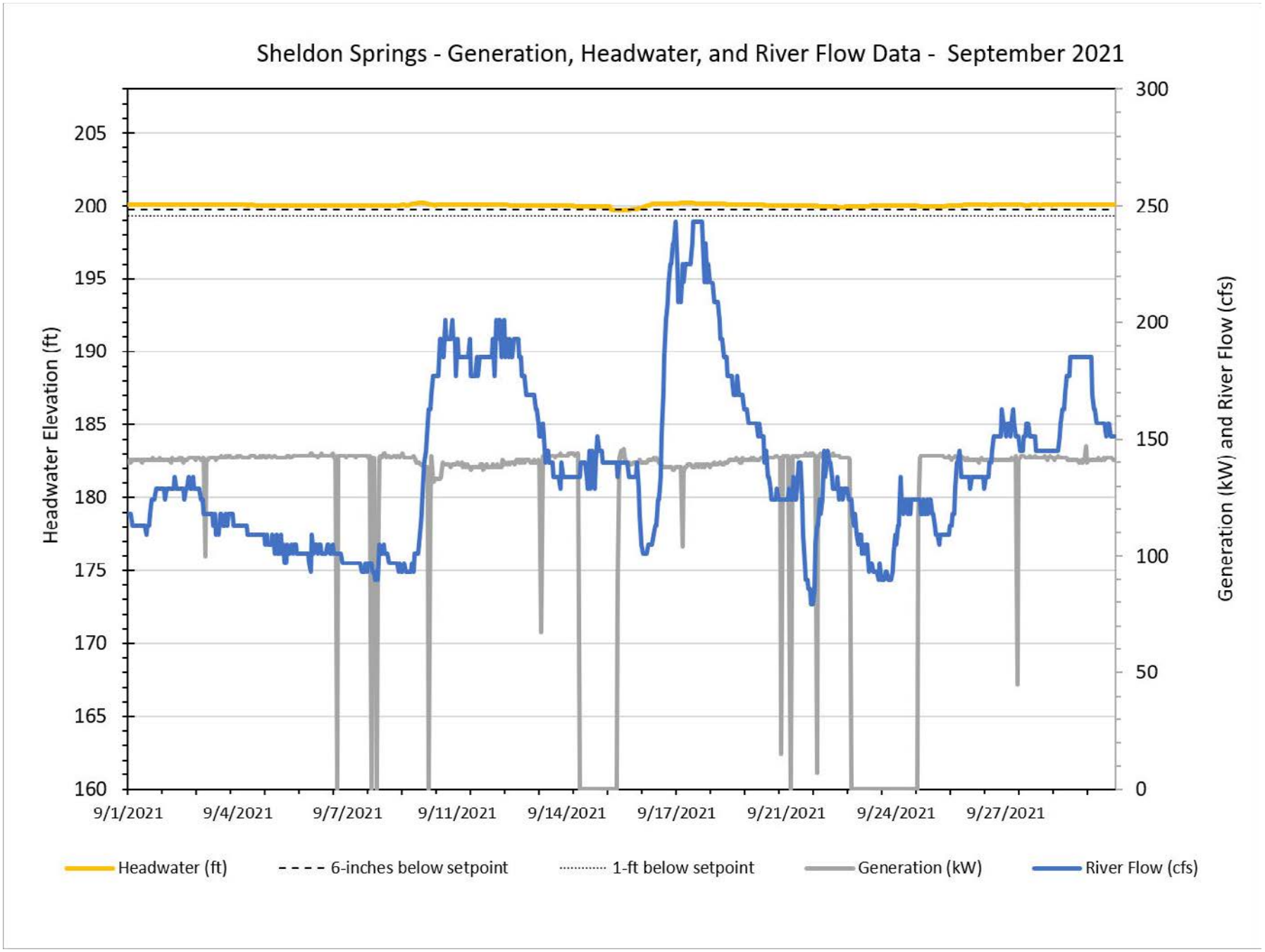

Sheldon Springs - Generation, Headwater, and River Flow Data - April 2021
Headwater Elevation (ft)
205
200
195
190
185
180
175
170
165
160
Generation (kW) and River Flow (cfs)
25,000
20,000
15,000
10,000
5,000
0
4/1/2021
4/4/2021
4/7/2021
4/11/2021
4/14/2021
4/17/2021
4/21/2021
4/24/2021
4/27/2021
Headwater (ft)
6-inches below setpoint
1-ft below setpoint
Generation (kW)
River Flow (cfs)

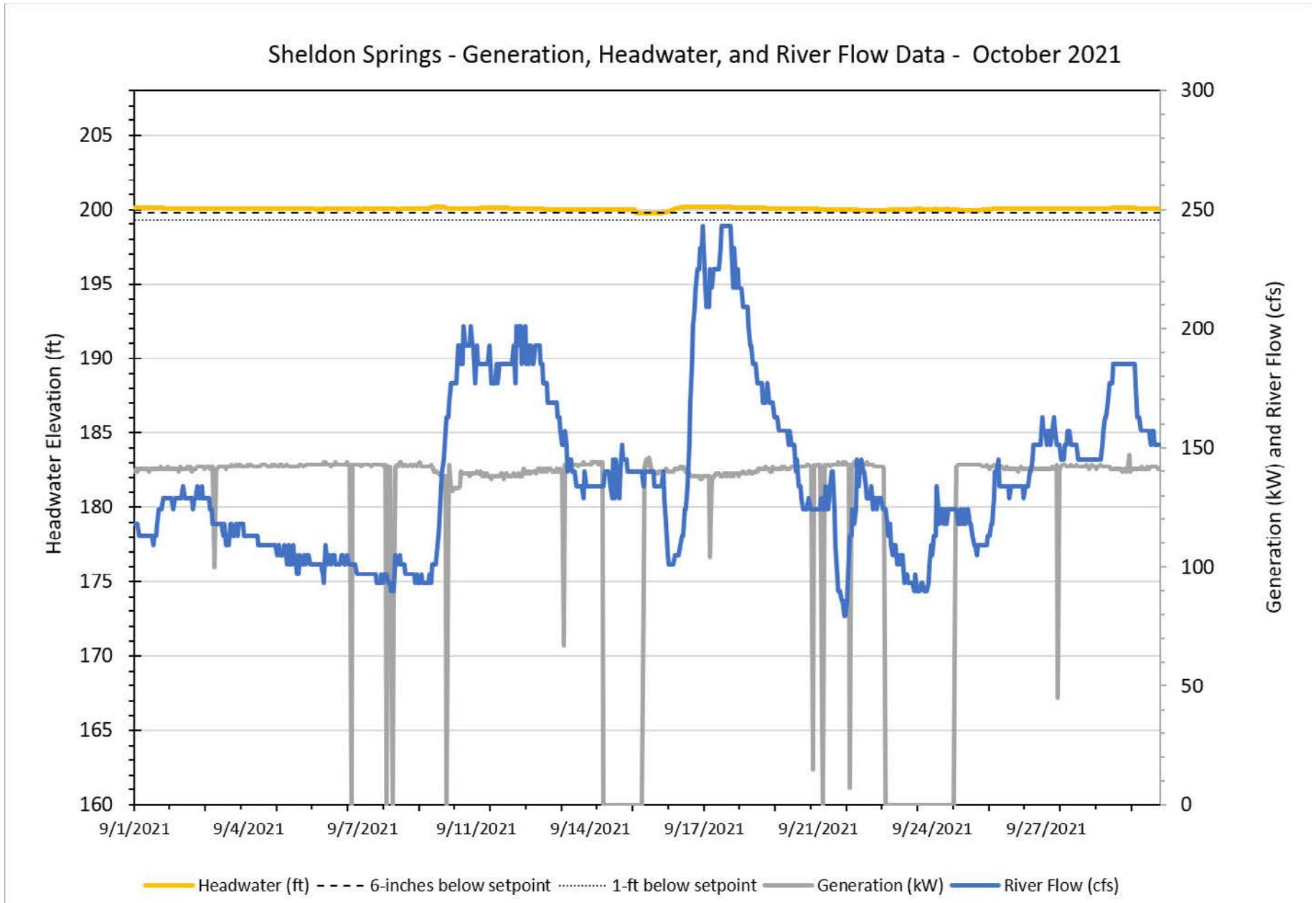

Sheldon Springs - Generation, Headwater, and River Flow Data - May 2021
Headwater Elevation (ft)
205
200
195
190
185
180
175
170
165
160
Generation (kW) and River Flow (cfs)
25,000
20,000
15,000
10,000
5,000
0
5/1/2021
5/4/2021
5/7/2021
5/11/2021
5/14/2021
5/17/2021
5/21/2021
5/24/2021
5/27/2021
5/31/2021
Headwater (ft)
6-inches below setpoint
1-ft below setpoint
Generation (kW)
River Flow (cfs)

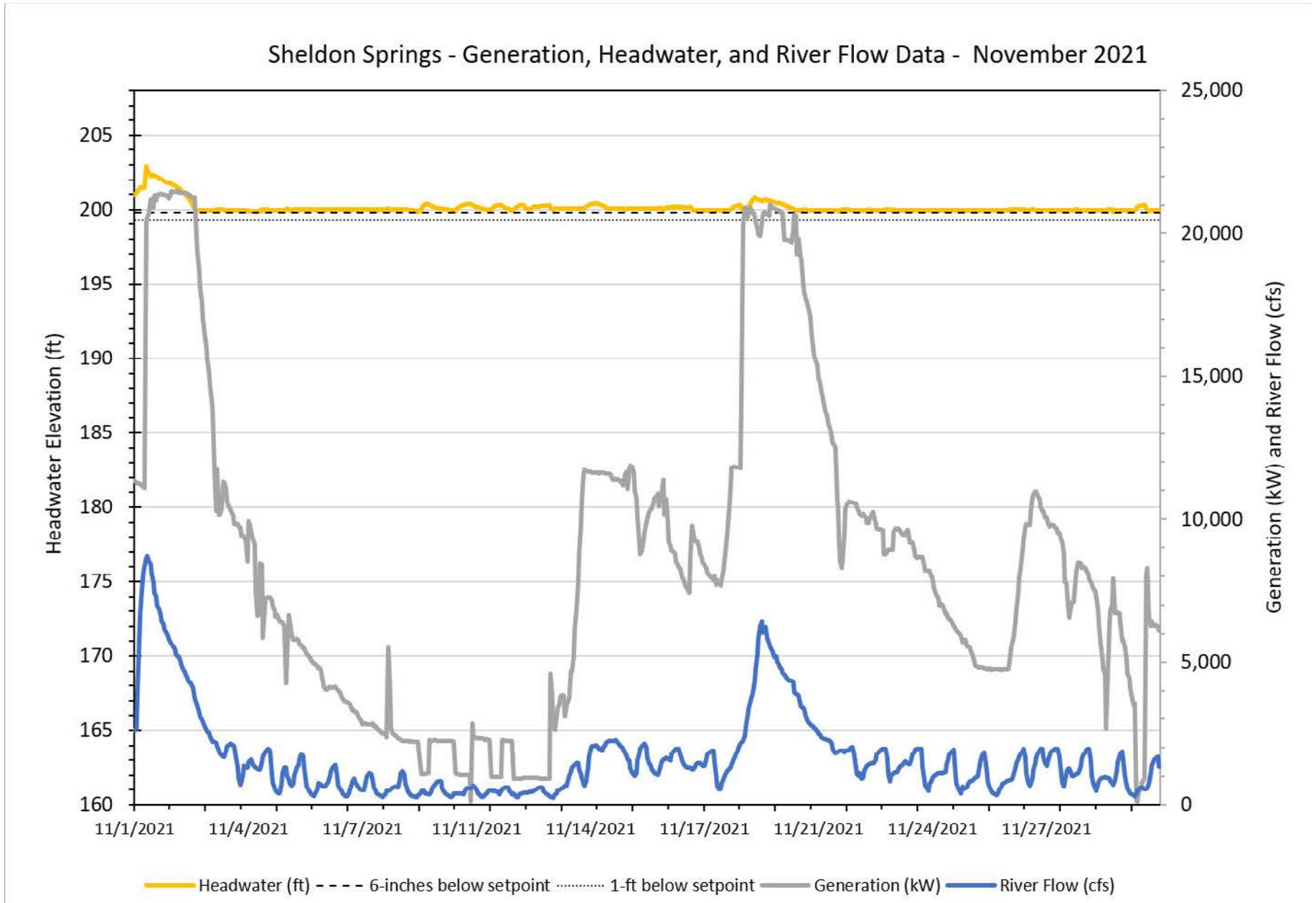

Sheldon Springs - Generation, Headwater, and River Flow Data - June 2021
Headwater Elevation (ft)
205
200
195
190
185
180
175
170
165
160
1,400
1,200
1,000
800
600
400
200
0
Generation (kW) and River Flow (cfs)
6/1/2021
6/4/2021
6/7/2021
6/11/2021
6/14/2021
6/17/2021
6/21/2021
6/24/2021
6/27/2021
Headwater (ft)
6-inches below setpoint
1-ft below setpoint
Generation (kW)
River Flow (cfs)

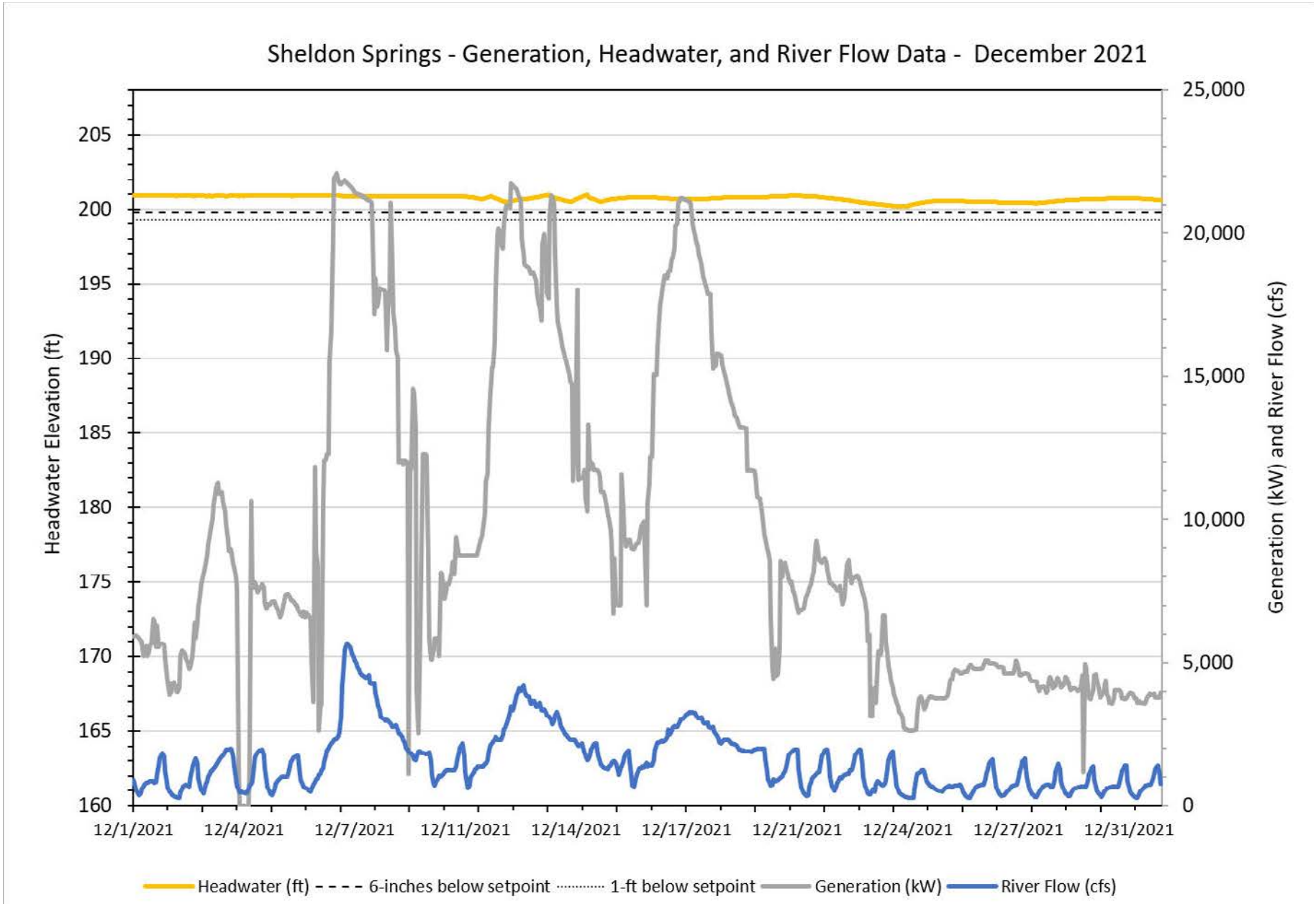

Sheldon Springs - Generation, Headwater, and River Flow Data - July 2021
Headwater Elevation (ft)
205
200
195
190
185
180
175
170
165
160
1,200
1,000
800
600
400
200
0
Generation (kW) and River Flow (cfs)
7/1/2021
7/4/2021
7/7/2021
7/11/2021
7/14/2021
7/17/2021
7/21/2021
7/24/2021
7/27/2021
7/31/2021
Headwater (ft)
6-inches below setpoint
1-ft below setpoint
Generation (kW)
River Flow (cfs)

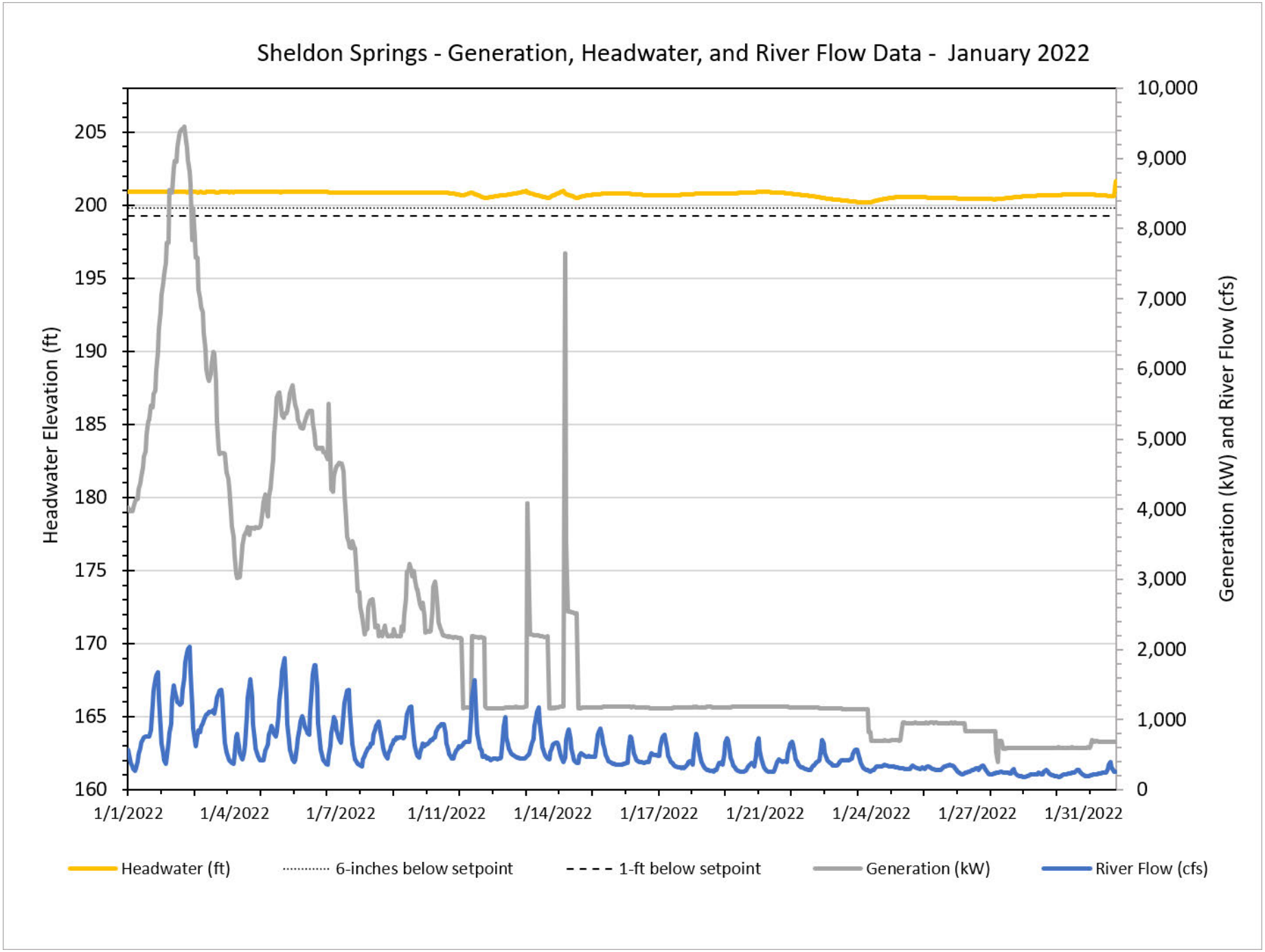

Sheldon Springs - Generation, Headwater, and River Flow Data - August 2021
Headwater Elevation (ft)
205
200
195
190
185
180
175
170
165
160
Generation (kW) and River Flow (cfs)
600
500
400
300
200
100
0
8/1/2021
8/4/2021
8/7/2021
8/11/2021
8/14/2021
8/17/2021
8/21/2021
8/24/2021
8/27/2021
8/31/2021
Headwater (ft)
6-inches below setpoint
1-ft below setpoint
Generation (kW)
River Flow (cfs)


Sheldon Springs - Generation, Headwater, and River Flow Data - September 2021
Headwater Elevation (ft)
205
200
195
190
185
180
175
170
165
160
Generation (kW) and River Flow (cfs)
300
250
200
150
100
50
0
9/1/2021
9/4/2021
9/7/2021
9/11/2021
9/14/2021
9/17/2021
9/21/2021
9/24/2021
9/27/2021
Headwater (ft)
6-inches below setpoint
1-ft below setpoint
Generation (kW)
River Flow (cfs)


Sheldon Springs - Generation, Headwater, and River Flow Data - October 2021
Headwater Elevation (ft)
205
200
195
190
185
180
175
170
165
160
Generation (kW) and River Flow (cfs)
300
250
200
150
100
50
0
9/1/2021
9/4/2021
9/7/2021
9/11/2021
9/14/2021
9/17/2021
9/21/2021
9/24/2021
9/27/2021
Headwater (ft)
6-inches below setpoint
1-ft below setpoint
Generation (kW)
River Flow (cfs)


Sheldon Springs - Generation, Headwater, and River Flow Data - November 2021
Headwater Elevation (ft)
205
200
195
190
185
180
175
170
165
160
25,000
20,000
15,000
10,000
5,000
0
Generation (kW) and River Flow (cfs)
11/1/2021
11/4/2021
11/7/2021
11/11/2021
11/14/2021
11/17/2021
11/21/2021
11/24/2021
11/27/2021
Headwater (ft)
6-inches below setpoint
1-ft below setpoint
Generation (kW)
River Flow (cfs)


Sheldon Springs - Generation, Headwater, and River Flow Data - December 2021
Headwater Elevation (ft)
205
200
195
190
185
180
175
170
165
160
Generation (kW) and River Flow (cfs)
25,000
20,000
15,000
10,000
5,000
0
12/1/2021
12/4/2021
12/7/2021
12/11/2021
12/14/2021
12/17/2021
12/21/2021
12/24/2021
12/27/2021
12/31/2021
Headwater (ft)
6-inches below setpoint
1-ft below setpoint
Generation (kW)
River Flow (cfs)


Sheldon Springs - Generation, Headwater, and River Flow Data - January 2022
Headwater Elevation (ft)
205
200
195
190
185
180
175
170
165
160
Generation (kW) and River Flow (cfs)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1/1/2022
1/4/2022
1/7/2022
1/11/2022
1/14/2022
1/17/2022
1/21/2022
1/24/2022
1/27/2022
1/31/2022
Headwater (ft)
6-inches below setpoint
1-ft below setpoint
Generation (kW)
River Flow (cfs)

Attachment 6

New FERC License

[PENDING: To be submitted upon receipt of the new FERC license.]