GREAT RIVER HYDRO, LLC

Bellows Falls Hydroelectric Project
FERC Project No. 1855-045

APPLICATION FOR NEW LICENSE

Initial Statement and
Exhibits A, B, C, D, F (Public),
G (excluding maps), and H

May 1, 2017

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Index for License Application

Exhibits Other than Exhibit E

Initial Statement and Additional Information

Exhibit A: Project Description

Exhibit B: Project Operations and Resource Utilization

Exhibit C: Construction History and Proposed Construction

Exhibit D: Statement of Project Costs and Financing

Exhibit F: General Design Drawings and Supporting Design Report (Public Version)

Exhibit G: Maps of Location, Boundary, Federal Lands, and Nonfederal Land Ownership (large format maps, boundary descriptions, and boundary shapefiles filed separately)

Exhibit H: Plans and Ability of Applicant to Operate Project Efficiently for Relicense

Exhibit E: Consolidated Environmental Report for the Wilder, Bellows Falls, and Vernon Projects

Exhibit F–CEII: Large Format Facility Drawings (Critical Energy Infrastructure Information)

Exhibit G: Large Format Project Area Maps, and Boundary Descriptions

Exhibit G: Project Boundary Shapefiles (ArcGIS in zipfile format)

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Final Application for New License for
Major Water Power Project — Existing Dam

Bellows Falls Project (FERC No. 1855)

INITIAL STATEMENT AND EXHIBIT A: PROJECT DESCRIPTION

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INITIAL STATEMENT

BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION

Application for License for Major Project—Existing Dam

1. Great River Hydro, LLC (Great River Hydro or Applicant), applies to the Federal Energy Regulatory Commission (Commission or FERC) for a new license for the existing Bellows Falls Hydroelectric Project (Bellows Falls Project or Project) (FERC No. 1855) as described in the attached exhibits. The current license for the Bellows Falls Project was issued on August 3, 1979, and expires on April 30, 2019.

2. The location of the Project is:

State:	New Hampshire	Vermont
Counties:	Cheshire, Sullivan	Windsor, Windham
Township or Nearby Town:	Walpole	Rockingham
Waterbody:	Connecticut River	

3. The exact name and business address of the Applicant is:

   Great River Hydro, LLC
   112 Turnpike Road, Suite 202
   Westborough, MA 01581

   The name and mailing address of the persons authorized to act as the Applicant's agent for this application are:

   John L. Ragonese
   FERC License Manager
   Great River Hydro, LLC
   One Harbour Place, Suite 330
   Portsmouth, NH 03801

   Erin O'Dea
   Vice President, Legal
   Great River Hydro, LLC
   112 Turnpike Road, Suite 202
   Westborough, MA 01581

   Scott Hall
   President
   Great River Hydro, LLC
   112 Turnpike Road, Suite 202
   Westborough, MA 01581

4. The Applicant is a Delaware limited liability company and is not claiming preference under Section 7(a) of the Federal Power Act. See 16 U.S.C. 796.

5. The statutory or regulatory requirements of the States of New Hampshire and Vermont that affect the Project as it exists with respect to bed and banks and the appropriation, diversion, and use of water for power purposes, and with respect to the right to engage in the business of developing, transmitting, and distributing power and in any other business necessary to accomplish the purpose of the license under the Federal Power Act, are:

   - Great River Hydro must obtain a water quality certification from the New Hampshire Department of Environmental Services and Section 401 (a)(1) of the Clean Water Act.
   - Great River Hydro must obtain a water quality certification from the Vermont Department of Environmental Conservation and Section 401 (a)(1) of the Clean Water Act.

   The steps which the Applicant has taken or plans to take to comply with the regulations cited above are:

   - Great River Hydro will submit requests for water quality certification from the two state agencies[1] in accordance with 18 C.F.R. § 5.23(b) within 60 days of FERC's issuance of a notice that the license application is ready for environmental analysis.

6. Great River Hydro owns all of the existing Project facilities. No Federally owned or operating facilities are associated with the Project.

[1] By letters dated April 1, 2016, both New Hampshire and Vermont agencies indicated that the Applicant must apply to each state for state-specific water quality certification.

ADDITIONAL INFORMATION REQUIRED BY 18 C.F.R. § 5.18(a)

1. *Identify every person, citizen, association of citizens, domestic corporation, municipality, or state that has or intends to obtain and will maintain any proprietary right necessary to construct, operate or maintain the project:*

   Great River Hydro has or intends to obtain and will maintain the proprietary rights necessary to construct, operate, and maintain the Project.

2. *Identify (providing names and mailing addresses):*

   a. *Every county in which any part of the project and any Federal facilities that would be used by the project would be located:*

Sullivan County
14 Main Street
Newport, NH 03773

Cheshire County Administration
33 West Street
Keene, NH 03431

Windsor County Clerk
12 The Green #101
Woodstock, VT 05091

Windham County Clerk
PO Box 207
Newfane, VT 05345

   b. *Every city, town, or similar local political subdivision:*

      (i). *In which any part of the Project, and any Federal facility that would be used by the project, would be located:*

Town of Cornish
488 Town House Rd
Cornish, NH 03745

City of Claremont
58 Opera House Square
Claremont, NH 03743

Town of Charlestown
PO Box 385
Charlestown, NH 03603-0385

Town of Walpole
PO Box 729
Walpole, NH 03608

Town of Windsor
29 Union St.
Windsor, VT 05089

Town of Weathersfield
PO Box 550
Ascutney, VT 05030-0550

Town of Springfield
96 Main St.
Springfield, VT 05156

Town of Rockingham
PO Box 370
Bellows Falls, VT 05101-0370

(ii). That has a population of 5,000 or more people and is located within 15 miles of the project dam.

The cities and towns listed in (b)(i) above are the only ones that meet these criteria (based on 2010 U.S. Census data).

(iii). Every irrigation district, drainage district or similar special purpose political subdivision (A) in which any part of the project is located, and any Federal facility that is or is proposed to be used by the project is located, or (B) that owns, operates, maintains, or uses any project facility or any Federal facility that is or is proposed to be used by the project:

No irrigation or drainage districts meet these criteria.

(iv). Every other political subdivision in the general area of the Project that there is reason to believe would likely be interested in, or affected by, the application.

Great River Hydro is not aware of other political subdivisions in the general area of the Project.

(v). All Indian tribes that may be affected by the Project.

A. No federally recognized Tribes are located in New Hampshire or Vermont; however, FERC identified the following federally recognized Tribe based in Charlestown, Rhode Island:

Narragansett Indian Tribe
Doug Harris, Deputy Tribal Historic Preservation Officer
4425-A South County Trail
Charlestown, RI 02813

B. The four Vermont state-recognized Abenaki Tribes, whose traditional lands encompass the Project are listed below:

i. Nulhegan Band of the Coosuk Abenaki Nation
Chief Don Stevens
156 Bacon Drive
Shelburne, VT 05482

ii. Elnu Tribe of the Abenaki
Chief Roger Longtoe Sheehan
5243 VT Route 30
Jamaica, VT 05343

iii. Koasek Traditional Band of the Koas Abenaki Nation
Co-chiefs Shirley Hook, Amy Hook Therrien, Carrie Gendreau
PO Box 272
Newbury, VT 05051

iv. Sovereign Abenaki Nation of Missisquoi
Chief Lawrence Moose Lampman
PO Box 133
Swanton, VT 05488

C. Additional Abenaki Tribal groups:

i. Cowasuck Band – Pennacook/ Abenaki People
Sôgmo Paul Pouliot
PO Box 52
840 Suncook Valley Rd
Alton, NH 03809-0052

ii. Koasek Traditional Band of the Sovereign Abenaki Nation
Chief Paul J. Bunnell
32 Hoit Mill Rd, #202
Weare, NH 03281

iii. Abenaki Nation of New Hampshire
262 Lancaster Rd.
Whitefield, NH 03598

3. *For a license (other than a license under Section 15 of the Federal Power Act), state that the applicant has made, either at the time of or before filing the application, a good faith effort to give notification by certified mail of the filing of the application to:*

   a. *Every property owner of record of any interest in the property within the bounds of the Project, or in the case of the Project without a specific boundary, each such owner of property which would underlie or be adjacent to any Project works, including any impoundments; and*

   b. *The entities identified in paragraph (2) above, as well as any other federal, state, municipal or other local government agencies that there is reason to believe would likely be interested in or affected by the application.*

   Because this is an application for a new license under Section 15 of the Federal Power Act (FPA), this regulatory provision does not apply.

4. *PURPA Benefits:*

   Great River Hydro is not seeking any PURPA benefits in association with the relicensing of the Project.

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VERIFICATION STATEMENT

This application is executed in the:

State of: Massachusetts,

County of: Worcester,

By Scott Hall, who being first duly sworn, deposes and says that the contents of this application for new license are true to the best of his knowledge or belief, and signs the application this 1st day of May, 2017.

Great River Hydro, LLC

By: _____

Name: Scott Hall

Title: President

Address: 112 Turnpike Road, Suite 202, Westborough MA 01581

Subscribed and sworn before me, a Notary Public of the State of Massachusetts, this 1st day of May, 2017.

_____

Notary Public

My commission expires: _____

ERIN A. O'DEA
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
November 26, 2021

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ACRONYMS AND ABBREVIATIONS

µS/cm	microsiemens per centimeter
1D	one-dimensional
2D	two-dimensional
acre-ft	acre-feet
ACHP	Advisory Council on Historic Preservation
A.D.	Anno Domini
APE	area of potential effects (as pertains to Section 106 of the National Historic Preservation Act)
ASMFC	Atlantic States Marine Fisheries Commission
AWS	area weighted suitability
B.C.	Before Christ
B.P.	Before Present
C.F.R.	Code of Federal Regulations
cfs	cubic feet per second
cm	centimeter
CRASC	Connecticut River Atlantic Salmon Commission
CSO	combined sewer overflow
CTDEEP	Connecticut Department of Energy and Environmental Protection
CWA	Clean Water Act
°C	degrees Celsius
DA	drainage area
DO	dissolved oxygen
DOI	U.S. Department of the Interior
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
El.	elevation
EO	element occurrence
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
°F	degrees Fahrenheit

FCA	Forward Capacity Auction
FERC	Federal Energy Regulatory Commission
FirstLight	FirstLight Power Resources
FLA	Final License Application
FMF	Fifteen Mile Falls Hydroelectric Project
FPA	Federal Power Act
ft	foot or feet
ft/s	feet per second
FWS	U.S. Department of the Interior, Fish and Wildlife Service
GIS	Geographic Information System
Great River Hydro	Great River Hydro, LLC
HI-Z	HI-Z Turb'N
HPMP	Historic Properties Management Plan
ILP	Integrated Licensing Process
IPANE	Invasive Plant Atlas of New England
ISO-NE	New England Independent System Operator
ISR	Initial Study Report
KOP	key observation point
kV	kilovolt
kVA	kilovolt-ampere
kW	kilowatt
kWh	kilowatt-hour
m^2	square meter
mgd	million gallons per day
mg/L	milligram(s) per liter
mg/m^3	milligrams per cubic meter
mL	milliliter
m.s.l.	mean sea level
MW	megawatt
MWh	megawatt-hour
National Register	National Register of Historic Places
NEIWPCC	New England Interstate Water Pollution Control Commission
NEPA	National Environmental Policy Act

NGVD29	National Geodetic Vertical Datum of 1929
NAVD88	North American Vertical Datum of 1988
NHA	New Hampshire Audubon
NHDES	New Hampshire Department of Environmental Services
NHFGD	New Hampshire Fish and Game Department
NHNHB	New Hampshire Natural Heritage Bureau
NHPA	National Historic Preservation Act
NHSHPO	New Hampshire State Historic Preservation Officer
NITHPO	Narragansett Indian Tribal Historic Preservation Officer
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTU	nephelometric turbidity unit
NWI	National Wetlands Inventory
PAD	Pre-Application Document
PGA	peak ground acceleration
PHABSIM	Physical Habitat Simulation
PIT	passive integrated transponder
PLP	Preliminary Licensing Proposal
PM&E measures	protection, mitigation, and enhancement measures
Projects	Wilder (FERC No. 1892), Bellows Falls (FERC No. 1855), and Vernon (FERC No. 1904) Hydroelectric Projects
PSP	Proposed Study Plan
PURPA	Public Utility Regulatory Policies Act of 1978
REC	Renewable Energy Credit
RPM	revolutions per minute
RM	river mile
R.S.A.	New Hampshire Revised Statutes Annotated
RSP	Revised Study Plan
RTE	rare, threatened, or endangered
§	Section of a statute such as 18 C.F.R. § 5.6 (c)

SD1	Scoping Document 1
SD2	Scoping Document 2
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
Sound	Long Island Sound
SPD	Study Plan Determination
sq. mi.	square mile(s)
TCP	Traditional Cultural Property
TMDL	total maximum daily load
TransCanada	TransCanada Hydro Northeast Inc.
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USGS	U.S. Geological Survey
USR	Updated Study Report
VAR	volt-ampere-reactive
VANR	Vermont Agency of Natural Resources
VDEC	Vermont Department of Environmental Conservation
VFWD	Vermont Fish & Wildlife Department
VTNHI	Vermont Natural Heritage Inventory
VTSHPO	Vermont State Historic Preservation Officer
VY	Vermont Yankee Nuclear Power Plant
WAP	Wildlife Action Plan
WSE	water surface elevation
WUA	weighted usable area

Final Application for New License for
Major Water Power Project — Existing Dam

Bellows Falls Project (FERC No. 1855)

EXHIBIT A: PROJECT DESCRIPTION

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TABLE OF CONTENTS

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LIST OF FIGURES

LIST OF TABLES

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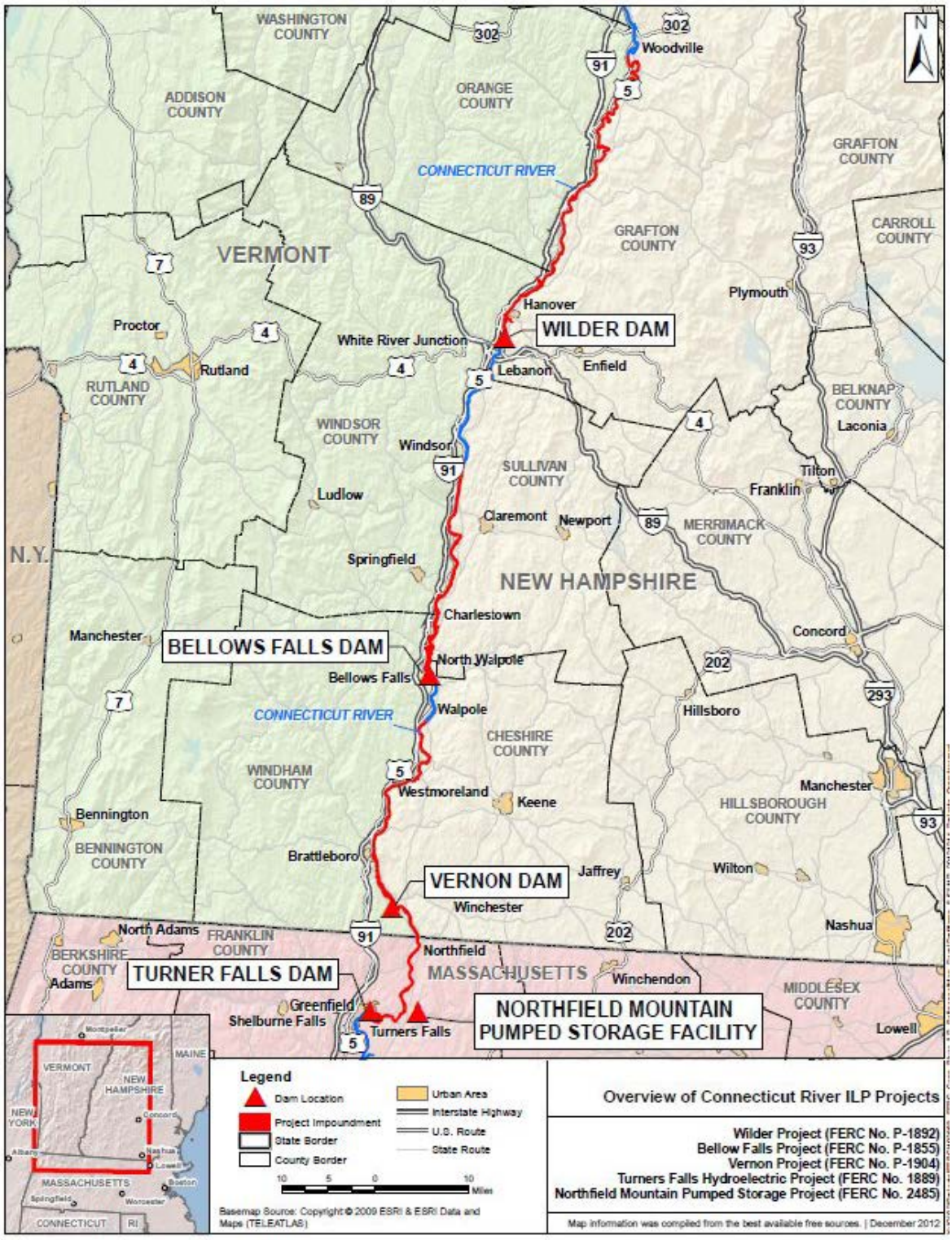
EXHIBIT A: PROJECT DESCRIPTION

Section 5.18(a)(5)(iii) of Title 18 of the Code of Federal Regulations (CFR) refers to Section 4.51 (License for Major Project—Existing Dam) for a description of information that an applicant must include in Exhibit A of its license application. Exhibit A is a description of the Project.

A1 Project Description

The Bellows Falls Project dam, canal, and powerhouse are located on the Connecticut River at river mile (RM) 173.7, about 1 mile upstream of Saxtons River and 3 miles downstream of the Williams River at the upper end of a sharp bend of the Connecticut River at Bellows Falls, Vermont in the town of Rockingham, Windham County, Vermont, and in the town of Walpole, Cheshire County, New Hampshire. Figure A-1 illustrates the location of the Project in relationship to the other Projects undergoing concurrent relicensing.[2] The Project is located in the towns of Rockingham, Springfield, Weathersfield, and Windsor Vermont; and Walpole, Charlestown, Claremont, and Cornish, New Hampshire.

[2] The five projects are collectively referred to as "the Connecticut River Projects" and include Great River Hydro's Wilder (FERC No. 1892), Bellows Falls (FERC No. 1855), and Vernon (FERC No. 1904) Projects along with FirstLight's Turners Falls (FERC NO. 1889) and Northfield Mountain Pumped Storage (FERC No. 2485) Projects.



Source: FERC (2013)

Figure A-1. Project location in relationship to the Connecticut River Projects.

The powerhouse is located downstream of the dam at the end of a power canal that is 1,700 feet (ft) long. Figure A-2 shows the primary Project facilities, which include the dam, spillway, power canal, powerhouse, substation and transformers, a line garage and storage building located near the powerhouse, fish passage facilities as described in Section A1.6, and recreation areas and facilities including three boat launches and picnic areas, a portage, and a visitor center with a fish ladder viewing window (see Exhibit E, Section 3.8, *Recreation Resources and Land Use*). Non-Project facilities located within the Project boundary include two switchyards that contain equipment owned by a regional transmission company.

Great River Hydro holds fee ownership of 835 acres of land in the Project. Of this acreage, 62 acres are used for plant and related facilities; 86 acres for public outdoor recreational use; 60 acres of other shoreline lands in Charlestown, New Hampshire; and the remaining 627 acres currently support local agriculture, farming, and wildlife management.

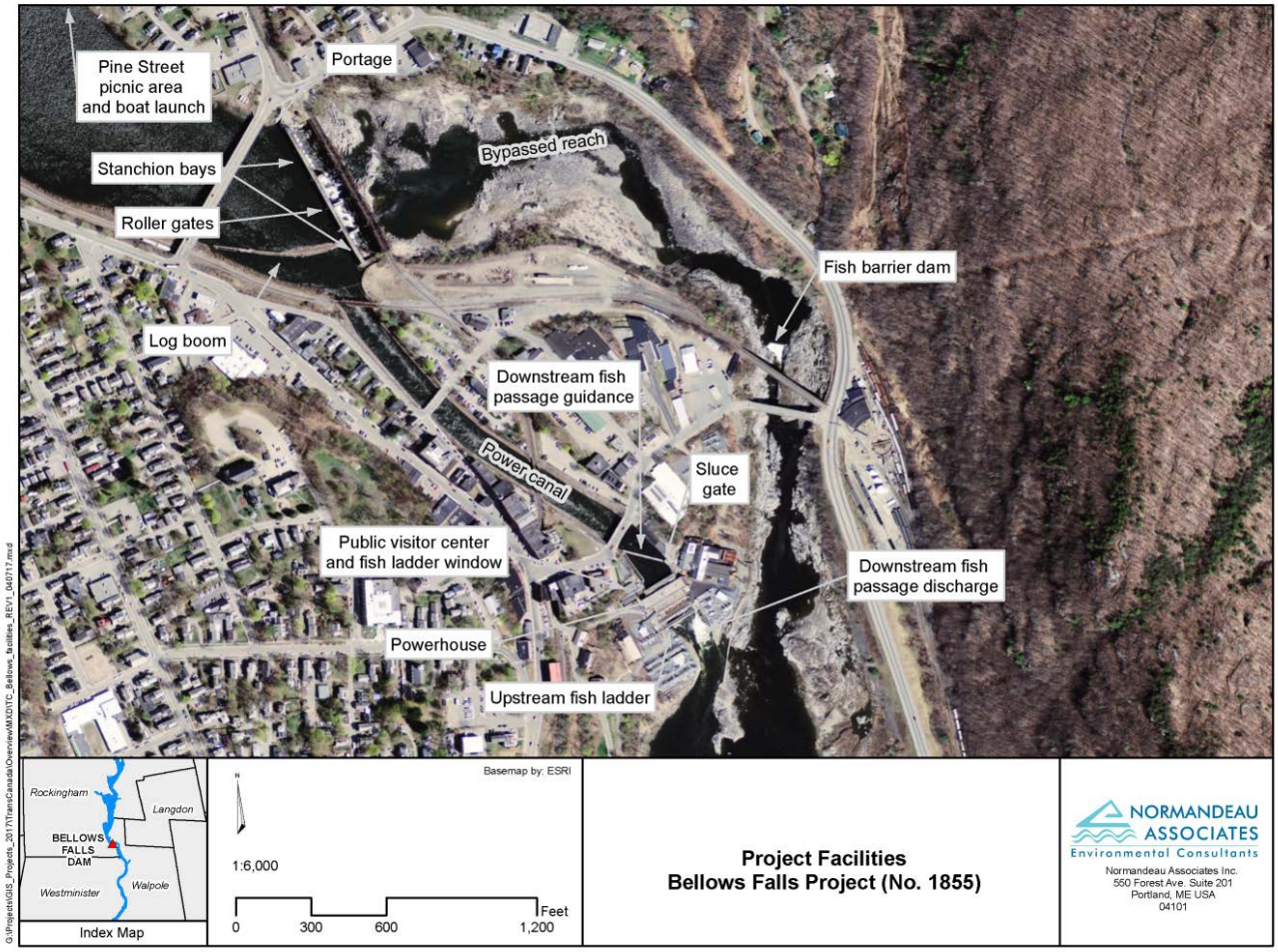


Figure A-2. Primary Project facilities.

A1.1 Impoundment

The Project impoundment extends upstream about 26 miles to Chase Island at Windsor, Vermont, about 1 mile below the Windsor Bridge. The impoundment has a surface area of 2,804 acres, about 74 miles of shoreline, and a total volume of 26,900 acre-feet (acre-ft) at elevation (El.) 291.63[3] ft (National Geodetic Vertical Datum of 1929 [NGVD29]) above mean sea level (m.s.l.) at the top of the stanchion boards. The overall operating range of the Project, accounting for both low inflow and most high inflows conditions, is typically between El. 288.63 ft and 291.63 ft, providing about 7,476 acre-ft of storage in the 3-ft range. The storage volume associated with the typical operating range, under non-spill conditions, between El. 289.6 ft and 291.4 ft is 4,642 acre-ft, or 62 percent of the overall usable storage.

A1.2 Dam and Spillway

The dam is a concrete gravity structure extending across the Connecticut River between Rockingham, Vermont, and Walpole, New Hampshire. Virtually all of the dam structure is located in New Hampshire. It is 643 ft long with a maximum height of about 30 ft and is divided by concrete piers into five bays. Two bays contain steel roller-type flood gates and the three other bays contain stanchion flashboards. A steel bridge runs the length of the dam for access and for operation of flashboards. A 25-ton gantry crane sits atop the bridge (Figure A-3, Table A-1).

Figure A-3. Bellows Falls Dam (from upstream side).

[3] All elevations in this exhibit are stated in National Geodetic Vertical Datum of 1929 (NGVD29).

Table A-1. Spillway facilities.

Gate Type	Number	Size (height or width, by length in ft)	Elevation (ft NGVD29)
Roller gates	2	18 x 115	273.63 (crest)
Stanchion bays	2	13 x 121 with flashboards	273.63 (crest)
Stanchion bays	1	13 x 100 with flashboards	278.63 (crest)

A1.3 Power Canal

A power canal connects the impoundment to the powerhouse (Figure A-4). The canal is lined with stone stabilized by a grid of concrete grade beams and walls. The downstream end of the canal is a concrete walled forebay. The canal is 100 ft wide at the top, about 36 ft wide at the bottom, about 29 ft deep, and approximately 1,700 ft long, including the length of the powerhouse forebay.

The canal creates a natural bypassed reach between the dam and the outlet of the powerhouse tailrace (Figure A-2 above). The reach is about 3,500 ft long and receives minimal water from leakage and significant amounts through spill during periods when flows exceed station capacity.

Figure A-4. Bellows Falls power canal (upstream end, looking upstream).

A1.4 Powerhouse and Appurtenant Facilities

The powerhouse superstructure is 186 ft by 106 ft by 52 ft and constructed of steel frame and brick (Figure A-5); the substructure is constructed of reinforced concrete excavated into bedrock. The powerhouse contains three turbine generating units (Figure A-6), electrical equipment, a switchboard (used for local station operation in emergency conditions), a machine shop, excitation equipment, emergency generator, air compressor, an overhead crane, offices, storage rooms, battery room, and ancillary equipment. Table A-2 provides turbine and generator specifications.

The maximum hydraulic capacity (calculated as the sum of each individual unit's maximum discharge capacity) is 11,010 cubic feet per second (cfs) and nameplate generating capacity is 13,600 kilowatts (kW) for each unit, and 40,800 kW in totals. Table A-2 provides turbine and generator specifications.

Table A-2. Turbines and generators.

Turbine Units	Nos. 1, 2, and 3
Type	Vertical Francis
Design head (ft)	57
Horsepower rating at design head	18,000
Maximum hydraulic capacity (cfs)	3,670
Minimum hydraulic capacity (cfs)	700
Revolutions per minute (rpm)	85.7
Intake trashrack clear spacing (inches)	4.0
Generators	
Nameplate capacity (kilovolt-ampere ([kVA])	17,000
Power factor	0.8
Nameplate capacity (kW)	13,600
Phase/frequency	3/60
Voltage	6,600

Figure A-5. Powerhouse.

Figure A-6. Unit No. 1 (background) and Unit No. 2 (foreground).

The concrete gravity intake is integral with the powerhouse structure with two water passages for each of the three turbine generating units. Water enters directly from the canal intake and into the scroll or wheel cases. The draft tubes, which have a maximum dimension of 20 ft high by 31 ft wide, discharge into the tailrace excavated partly in the bank and partly in the bed of the river (Table A-3). There are no draft tube gates. The scroll cases and draft tubes are formed in the substructure's concrete, which was poured on rock. The water passages for the three turbine generating units have trashracks with 4-inch clear spacing and two head gates that can be used in any one of the three units. One set of head gates, consisting of two gates measuring 25 ft high by 18.5 ft wide, is shared by all three units. The head gates are equipped with an electrically driven hoist that can be moved along a track system to any of the three units as needed. A hydraulic trashrack rake is used to pull river debris away from the unit intakes. It is manually operated and is driven to the trashracks in front of each unit on a set of tracks that are located on top of the forebay intake structure. The rake head is lowered to the bottom of the racks and retracted upward along the rack to remove debris. The debris is conveyed into a trailer for removal. An ice sluice/skimmer gate is located on the east side of the forebay and is 12 ft wide by 10 ft high. The tailrace is about 900 ft long, of which 500 ft are carved from the existing bedrock.

Table A-3. Dimensions and composition of head gates, draft tubes and draft tube gates.

Unit	Type	Dimension	Composition
Units 1–3	Head gates	2 gates per unit 1 set of gates shared by 3 units 25 ft high x 18 ft, 6 inches wide, each	Steel broome type
	Draft tubes	Varies in dimension Maximum = 20 ft high x 31 ft wide	Cast in concrete foundation
	Draft tube gates	None	n/a

A1.5 Electrical Facilities

Project electrical facilities include the generators, 6.6-kilovolt (kV) generator leads that extend approximately 80 ft from the powerhouse to an outdoor switchgear house located in a substation west of the powerhouse, switchgear, bus work, and two step-up transformers located in the substation (Figures A-7 and A-8). These two switchyards and the tie lines from the Project's step-up transformers are located within the Project boundary but are not Project facilities because this equipment is owned and operated by the regional transmission company, New England Power Company, doing business as National Grid.

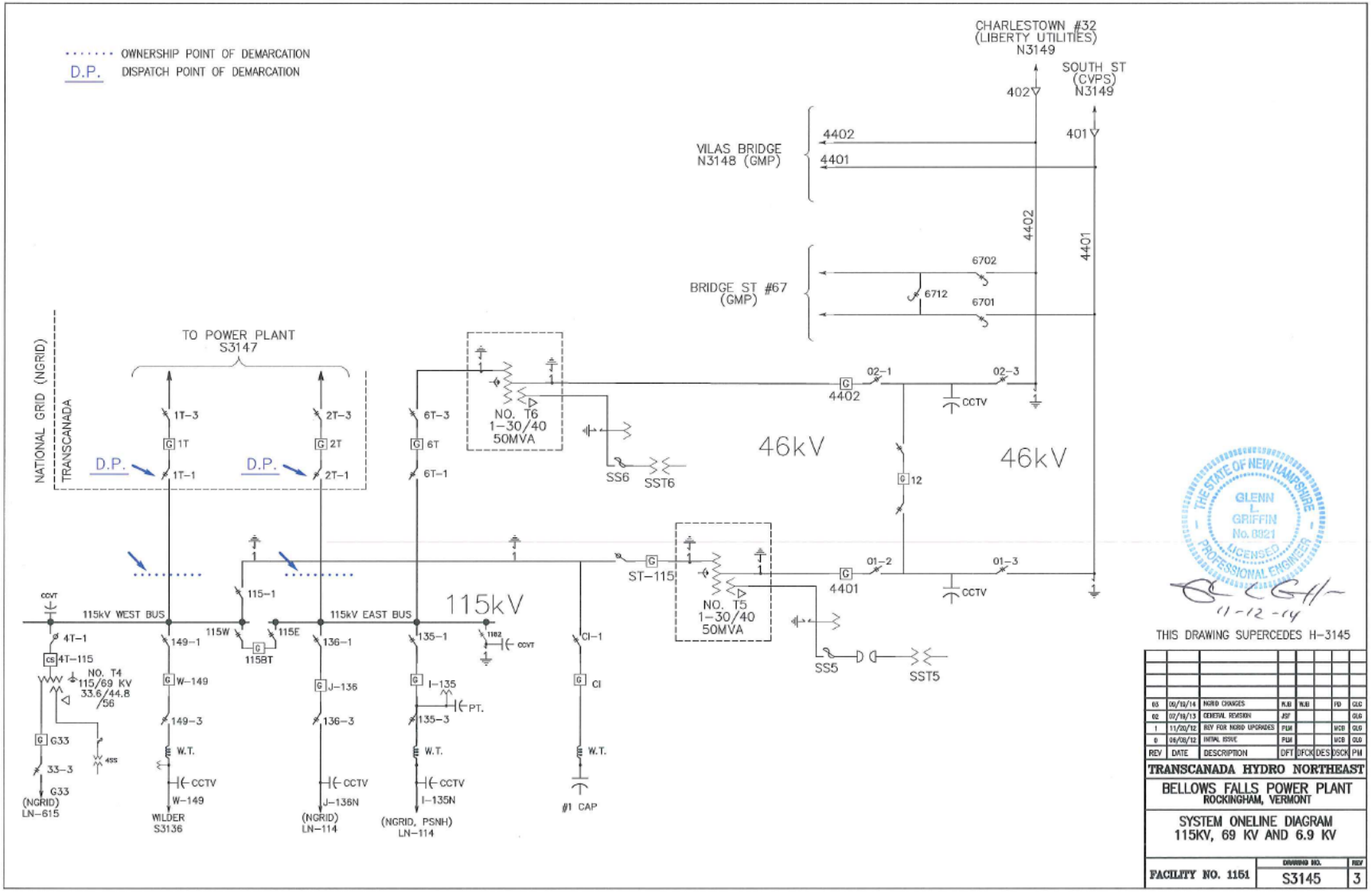


Figure A-7. Transmission interconnection schematic, 115 kV, 69 kV, and 6.9 kV.

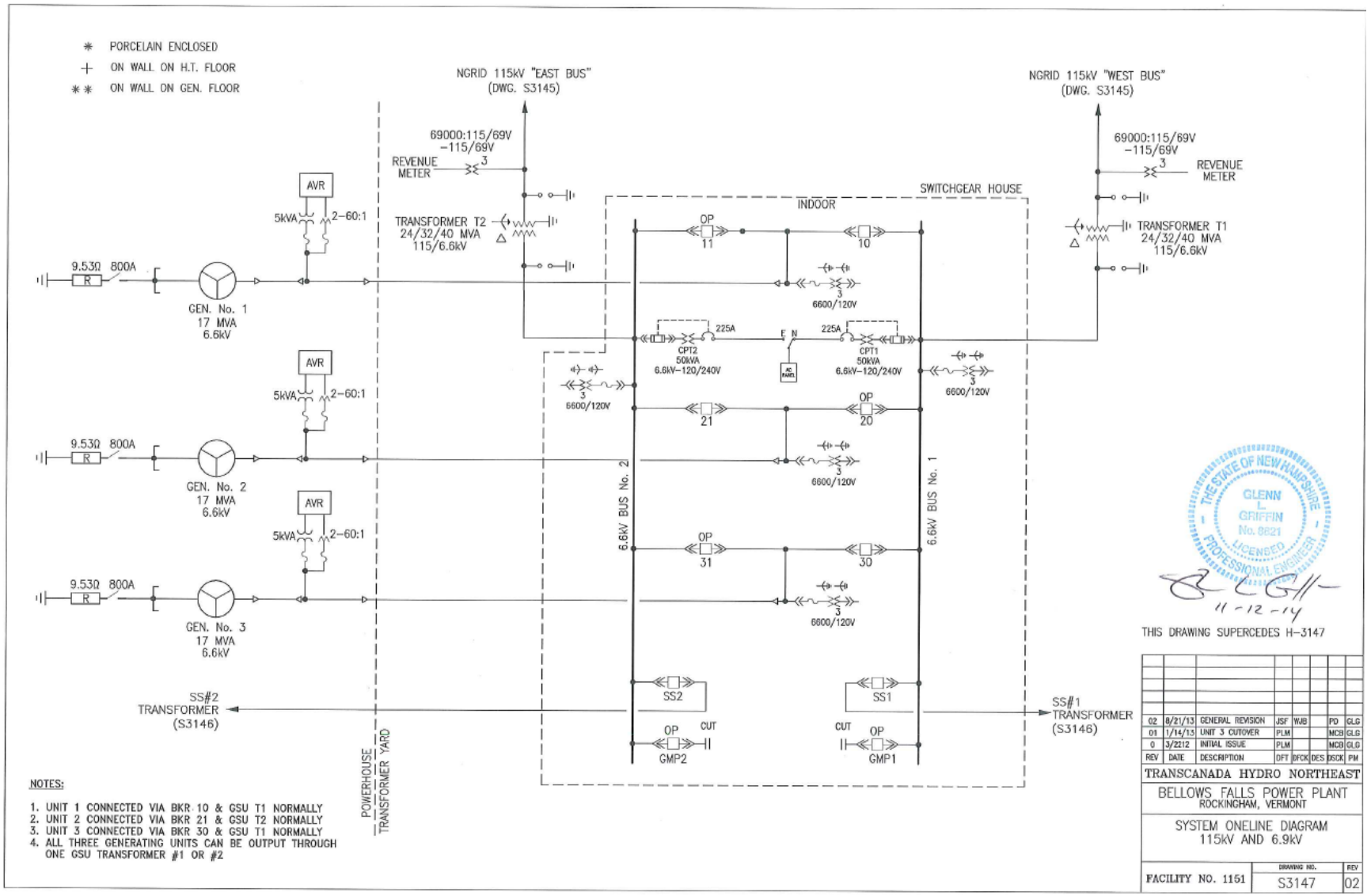


Figure A-8. Transmission interconnection schematic, 115 kV and 6.9 kV.

A1.6 Fish Passage Facilities

A1.6.1 Upstream Passage Facilities

The upstream fish passage system consists of a conventional vertical-slotted weir fish ladder at the powerhouse and an upstream concrete barrier dam in the bypassed reach (Figure A-9). The barrier dam prevents upstream migrating fish from being attracted by spillway discharge into the reach and later becoming trapped in isolated pools after spill ends. The barrier is located just upstream of the Boston and Maine Railroad Bridge. The fish ladder is a 920-ft-long, reinforced concrete structure with accessory electrical, mechanical, and pneumatic equipment that is designed to provide passage for migrating Atlantic Salmon past the dam by way of the forebay and canal, a vertical distance of about 60 ft. Upstream migrating fish are attracted to the tailrace channel by flow from the turbines. Once in the tailrace area, fish are attracted to the main entrance weir at the east end of the powerhouse.

Attraction water is provided by the upper three weirs containing slide gates, which open and close depending on the forebay water surface elevation (WSE) to maintain the required fish ladder flow. A skimmer gate/sluiceway is located in the forebay and is used for additional fish ladder attraction water. Water from this channel enters two diffuser openings at the fish ladder entrance. Fish enter the 8-ft-wide fish ladder entrance channel and "climb" to the forebay by swimming through a series of 67 slots and cascading pools with each succeeding weir spaced 8 ft apart and 12 inches higher than the last. After passing 34 pools, the fish enter a level turning section and pass through another 10 pools to the counting/trapping area. There, fish are guided by flow and crowder screens, travel through a 3-ft-wide flume, and pass an underwater viewing window where they may be observed and counted. From the counting/trapping area, fish continue to climb through an additional 22 pools to the ladder's 8-ft-wide exit channel into the forebay and canal. The exit channel (i.e., the last pool) includes a motor-driven head gate, widely spaced trashracks (sufficient to pass adult salmon), and slots for wooden stop logs. The last three weirs contain adjustable weir gates that can be lowered (opened) to provide a nearly constant 25 cfs fish ladder flow when the forebay WSE drops through its 3-ft operating range.

The fish ladder visitor center is located adjacent to the upper two pools and exit channel. The building's basement serves as a public viewing gallery with two underwater windows. The upper floor provides informational displays on hydro generation, recreation, archaeology, and anadromous fish restoration and has a picture window view of the fish ladder to the south (downstream). The Connecticut River Atlantic Salmon Commission (CRASC) provides an annual *Fish Passage Notification Schedule*, which sets the dates for upstream passage for all dams on the Connecticut River. Typically, the upstream fish ladder operates from May 15 through July 15 and in fall from September 15 through November 15 for Atlantic Salmon; however, in recent years, fish ladder operation has been suspended because of low salmon returns and abandonment of the program by the U.S. Department of the Interior, Fish and Wildlife Service (FWS) and the states.

Figure A-9. Upstream fish passage facilities.

A1.6.2 Downstream Passage Facilities

As of February 11, 2016, CRASC no longer requires downstream passage operations at Bellows Falls for Atlantic Salmon smolts (see Exhibit E, Section 3.5, *Fish and Aquatic Resources*). CRASC's annual *Fish Passage Notification Schedule* had set the dates for downstream passage for all dams on the Connecticut River. Downstream passage flows were provided for adult Atlantic Salmon from October 15 to December 31 if 50 or more adults were documented as having passed upstream. Downstream passage was provided by the forebay sluiceway/skimmer gate with fish being guided to the gate by a solid, partial depth diversion boom

across the canal. A small auxiliary gate located on the east side of the powerhouse was opened to direct fish that may get under the diversion boom to the sluiceway. The gate is motorized and operated locally as needed to pass river debris and ice.

A2 Lands of the United States

No lands of the United States are located within or adjacent to the Project boundary.

A3 Literature Cited

FERC (Federal Energy Regulatory Commission). 2013. Scoping document 2 for the Wilder (FERC No. 1892-026), Bellows Falls (FERC No. 1855-045), Vernon (FERC No. 1904-073), and Turners Falls (FERC No. 1889-081) hydroelectric projects, and the Northfield Mountain Pumped Storage Project (FERC No. 2485-063). Federal Energy Regulatory Commission, Washington, DC. April 15, 2013.

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Final Application for New License for
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Bellows Falls Project (FERC No. 1855)

EXHIBIT B: PROJECT OPERATIONS AND RESOURCE UTILIZATION

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TABLE OF CONTENTS

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LIST OF FIGURES

LIST OF TABLES

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EXHIBIT B: PROJECT OPERATIONS AND RESOURCE UTILIZATION

Section 5.18(a)(5)(iii) of Title 18 of the Code of Federal Regulations (CFR) refers to Section 4.51 (License for Major Project—Existing Dam) for a description of information that an applicant must include in Exhibit B of its license application. Exhibit B is a statement of Project operation and resource utilization.

B1 Existing and Proposed Project Operation

B1.1 Existing Project Operations

Project operations are automated and controlled from a consolidated hydro operations control center located in Wilder, Vermont. Great River Hydro, LLC (Great River Hydro), typically operates the Project in a coordinated manner with other Great River Hydro generating facilities on the Connecticut River, taking into consideration variations in electricity demand as well as natural flow in order to maximize the efficient use of available water.

Estimated and anticipated inflow forms the basis for bidding into the New England Independent System Operator's (ISO-NE's) day-ahead energy market. Day-ahead hourly bids reflect must-run generation periods associated with minimum flow periods, periods when sustained higher flows are anticipated, and opportunistic generation when inflow and available storage allows and electricity demand is anticipated to be high. Anticipated inflow calculations predict impoundment water surface elevations (WSEs) and determine whether spill gates must be operated to pass flow in excess of Project generating capacity. Estimated inflow is calculated using discharge from the Project plus/minus changes in impoundment elevation measured at the dam on an hourly basis, averaged over a rolling 6-hour period. Impoundment drawdown rates are typically less than 0.1 to 0.2 foot (ft) per hour and do not exceed 0.3 ft per hour based on Great River Hydro's established operating procedures. There is approximately 3,000 cubic feet per second (cfs) per hour per 0.1 ft of elevation, and 0.3 ft per hour represents a maximum station output. Restricting drawdown under spill conditions to the same maximum as the station prevents higher than typical drawdown rates or downstream flow increases.

The maximum station discharge with all three units operating is approximately 11,400 cfs, although 98 percent of the time flows are less than 11,235 cfs. The Project itself has a maximum discharge (generation plus spill) capacity of 119,785 cfs, and the flood of record, occurred in March 1936, was 156,000 cfs. Since then, three upstream U.S. Army Corps of Engineers (USACE) flood control structures have been built (Union Village, Ompompanoosuc River; North Hartland, Ottauquechee River; and North Springfield, Black River) and Moore dam, which has some flood control capability, was constructed. These facilities have helped to decrease the peak flow during flood events. Since the Moore dam began operating

in the late 1950s, the highest flow recorded at the Bellows Falls Project (as measured at the dam) was 103,397 cfs during Tropical Storm Irene on August 29, 2011.

The licensed minimum flow requirement at the Bellows Falls powerhouse is 1,083 cfs (or inflow if less) and is provided primarily through generation, typically at least 1,200 cfs. There is no minimum flow requirement through the dam into the bypassed reach, but leakage provides some flow in the bypassed reach (flows range between 125 to 300 cfs as calculated or estimated over the course of various studies. Additional non-generation flows are provided seasonally at the powerhouse on a schedule provided annually by the Connecticut River Atlantic Salmon Commission (CRASC) based on fish counts at downstream projects. If required, fish passage flows are provided in spring (May 15–July 15) and in fall (September 15–November 15) for upstream fish passage (25-cfs fishway flow and 55-cfs attraction flow) and for downstream fish passage (225 cfs). As of 2016, CRASC no longer requires downstream passage operations at Bellows Falls for Atlantic Salmon smolts in spring, and it only requires fall downstream passage operations if 50 or more adults are documented passing upstream (see Exhibit A1.6, *Fish Passage Facilities*). During the summer recreation season, beginning the Friday before Memorial Day and continuing through the last weekend in September, Great River Hydro maintains a self-imposed minimum impoundment WSE of elevation (El.) 289.6 as measured at the dam from Friday at 4:00 p.m. through Sunday at midnight and on holidays during this period, unless the Project is experiencing high flows above generating capacity.

B1.2 Operations during Adverse, Mean, and High Water Years and Emergency Conditions

When inflows are within the Project's generating capacity, Great River Hydro uses the limited impoundment storage at the Project to dispatch generation as required to meet the generation schedule managed by ISO-NE. During the course of any day, generation can vary between the required minimum flow and full generating capacity, depending on inflow and impoundment storage. Over the course of a day, the Project generally passes the average daily inflow.

High flows occur routinely throughout the year at the Project, most often during the spring freshet, the fall rainy season, and significant rainfall events affecting the Connecticut River watershed below the Moore dam. Annually flows at the dam exceed station capacity approximately 28 percent of the time. During periods of sustained high flows, Great River Hydro dispatches Project generation in a must-run status to use available water for generation. Spring runoff on the Connecticut River typically occurs in phases based on latitude. The seasonal storage capability of the Fifteen Mile Falls Project (FMF), Moore dam primarily, is limited in comparison to the total amount of inflow it receives. However, the storage capacity at the FMF Project is used during spring runoff to "shave" the maximum anticipated peak flows downstream and refill the impoundments. This operation reduces downstream high water conditions at the downstream dams including the Bellows Falls Project which is typically spilling at that time. During periods of ice movement, frequent

upstream observations and river elevation checks are made within the impoundment. When an ice jam occurs immediately upstream of the dam, an increased or artificial inflow condition is created by a large swell of water in front of the jam as the water behind the jam pushes the ice and water in front of it. When this condition occurs, the station or roller gate discharge must be increased to pass water during this temporary situation and to keep the impoundment elevation within its operating limits because there is no impoundment storage capacity in this circumstance.

When anticipated inflows to the Project impoundment increase above Project generating capacity, Great River Hydro initiates “river profile” operations by lowering the impoundment elevation at the dam. When the calculated anticipated inflows exceed Project generating capacity, various combinations of spill gates (see Table A-1 in Exhibit A, *Project Description*) are operated and impoundment elevations are maintained at certain set-points until flows exceed the total spill capacity of the Project, when flows would surcharge WSE at the dam. Table B-1 lists maximum impoundment elevations that are maintained based on different anticipated inflow levels at the Project.

Typically, routine and periodic maintenance does not require impoundment drawdown outside the license-specified operating range. Gate inspections and minor repairs are often performed during spill conditions when gates are out of water. Otherwise coffer dams are installed or other methods are employed to avoid deviating from normal operation or potentially restricting the ability to pass flows in emergencies. If the need arises for unanticipated reasons or emergencies, Great River Hydro would consult with state and federal regulatory agencies, seek authorization from the Federal Energy Regulatory Commission (FERC) if needed, and secure any necessary permits to conduct such work. Requirements such as minimum flow are ensured through the use of alternative conveyance structures (other units or gates). Extreme high water emergencies requiring impoundment drawdowns beyond normal operating levels, as specified in Project operating procedures, are necessary for public safety, flood management, and dam safety purposes.

Table B-1. River profile and high flow operations, inflows, and impoundment elevations.

Anticipated Inflow (cfs)	Maximum Water Surface Elevation (ft) at the Dam (NGVD29)[a]
<11,000	291.6
11,000–20,000	291.1
20,000–50,000	290.1 (289.6 if ice is present)
50,000–90,000	289.6 and partial stanchion board removal @ 52,000 cfs
>90,000	All gates are opened and all stanchion bays removed, impoundment elevation increases dependent upon inflow increases; impoundment WSE rises from 289.6 and is maintained at 290.6 as long as possible before WSE surcharges as inflow increases.

a. All vertical elevations in Exhibit B are stated in National Geodetic Vertical Datum of 1929 (NGVD29).

B1.3 Proposed Project Operations

At this time, Great River Hydro is not proposing changes to operation of the Project, pending additional stakeholder consultation and analysis of potential alternative operations scenarios.

B2 Dependable Capacity and Annual Generation

B2.1 Estimate of Dependable Capacity and Average Annual Generation

At full load, with inflow equaling a maximum station discharge of at least 11,200 cfs, the Project has the capability of producing 49.0 megawatts (MW). Ten-year average annual generation (2007–2016) is approximately 247,373 megawatt-hours (MWh).

B2.2 Annual Plant Factor

The average annual plant factor is calculated as the average annual generation / nameplate capacity x 8,760 hours per year. Nameplate capacity of the Project is 40.8 MW. Based on the 10-year average annual generation, the average annual plant factor = 247,373 MWh / (40.8 MW x 8,760 hours) = 69.2 percent.

B2.3 Project Flows and Flow Exceedance Curves

The Bellows Falls Project has a total drainage area (DA) of 5,414 square miles (sq. mi.). Inflow is from discharge from the Wilder Project and natural inflow from the 2,039 sq. mi. of intermediate DA downstream of the Wilder Project. More than 42 percent of the total enters as unmanaged flow downstream of the Wilder Project, except under flood flow conditions when the USACE dams on the Ottauquechee and Black rivers store water temporarily (see Exhibit E, Section 3.1.1, *Overview of the*

Basin). Under normal generation conditions, it takes about 8 hours for flow from the Wilder Project to reach Bellows Falls dam.

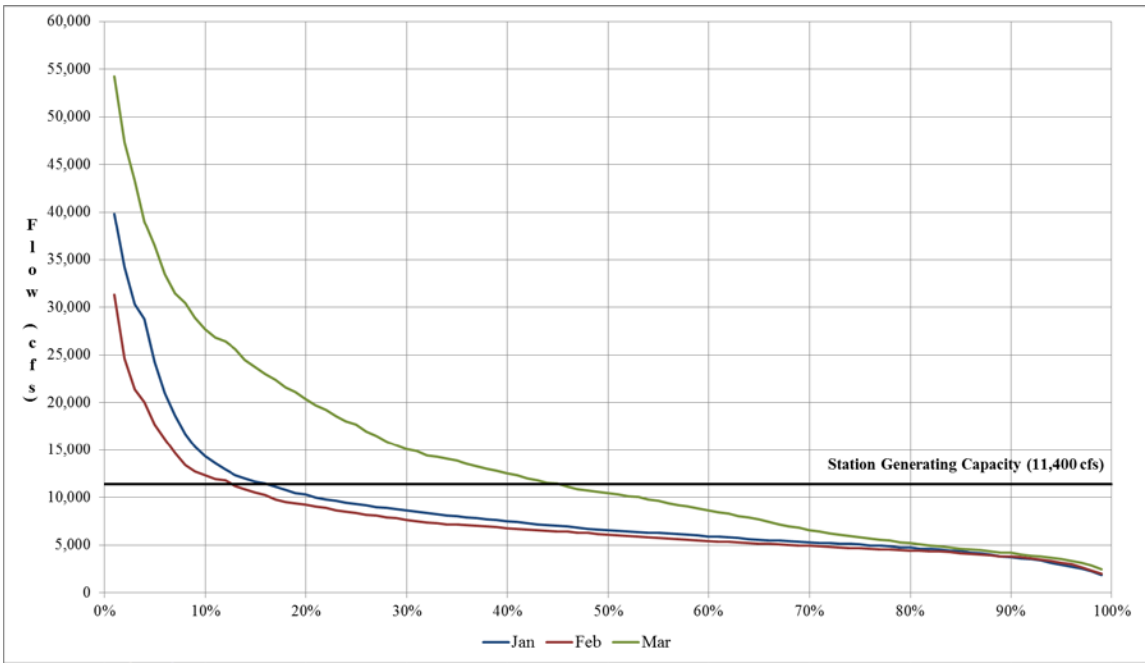
The impoundment is approximately 26 miles long and extends upstream to Chase Island at Windsor, Vermont, about 1 mile downstream of the Windsor Bridge. The impoundment is riverine in character and ranges in depths of several feet to about 30 ft near the dam. Bathymetry in the impoundment changes rapidly as a result of underlying bedrock, channel constriction, deposition, and scour primarily associated with high flows, such as those that occurred with Tropical Storm Irene in late August 2011. Because of the relatively flat terrain from the upper extent of the impoundment to the dam, the Project has limited storage capacity, which is primarily a function of impoundment length and operating range. Under normal generation conditions, regulated flow from the FMF Project reaches Wilder dam in about 8 hours on average and flows released at the Wilder Project generally reach the Bellows Falls dam in another 8 hours on average. Table B-2 summarizes the minimum, mean, and maximum values of average monthly flows from 1979 through 2015.

Table B-2. Bellows Falls estimated minimum, mean, and maximum average monthly flow values (cfs), January 1979—December 2015.

Month	Minimum	Year	Mean	Maximum	Year
January	2,588	1981	8,666	20,573	2006
February	2,697	1980	7,584	21,499	1981
March	4,405	2015	13,729	33,660	1979
April	7,690	1995	25,776	40,676	2008
May	7,137	1995	14,924	29,404	1996
June	3,038	1999	9,104	20,972	2006
July	1,896	1991	6,011	16,880	2013
August	1,631	2001	5,132	17,803	2008
September	1,533	1995	4,270	13,056	2011
October	1,810	2001	8,167	25,550	2005
November	2,771	2001	10,048	22,794	2005
December	3,558	2001	10,423	22,440	2003

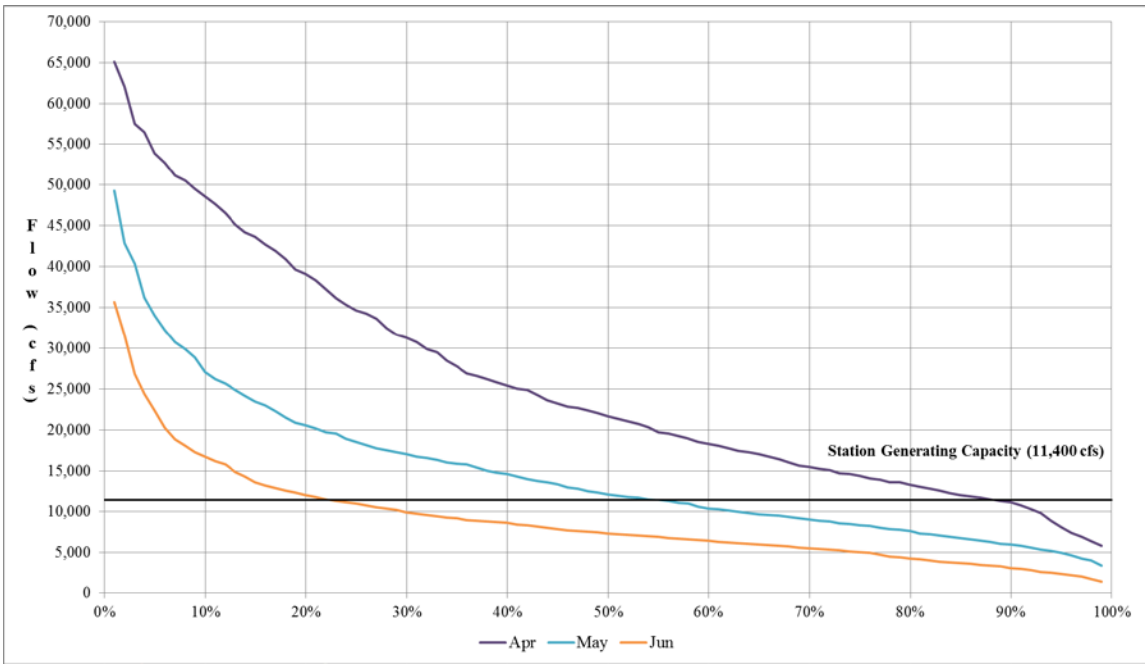
Source: USGS (2016, as modified by Great River Hydro)

Figures B-1 through B-4 provide monthly flow exceedance curves for the Bellows Falls Project from January 1, 1979, to December 31, 2015. Data are based on U.S. Geological Survey (USGS) gage no. 01154500, Connecticut River at North Walpole, New Hampshire (subsequently referred to as the North Walpole gage), located downstream of the confluence with Saxtons River (about 2 miles downstream from Bellows Falls dam). To estimate flow at only the Bellows Falls Project, the daily flow data from the North Walpole gage were prorated by 0.986 based on gaged DA to remove the small effect of inflow from the Saxtons River under most circumstances.



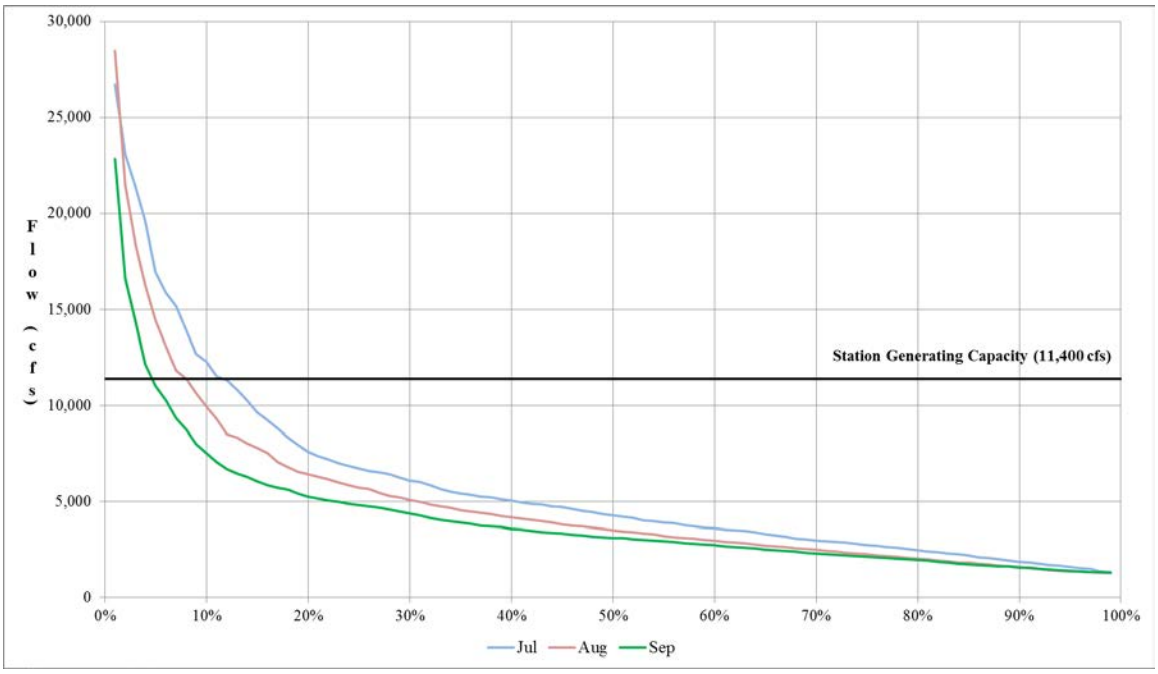
Source: USGS (2016, as modified by Great River Hydro)

Figure B-1. Flow exceedance curves, January–March (based on flow data from January 1, 1979 to December 1, 2015).



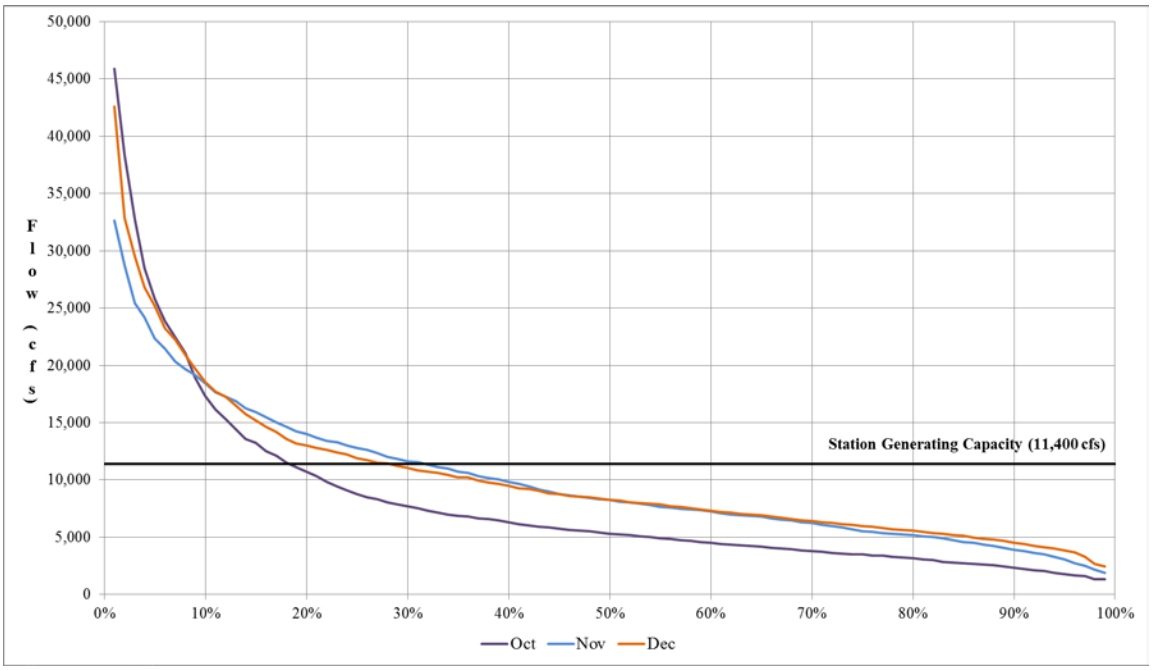
Source: USGS (2016, as modified by Great River Hydro)

Figure B-2. Flow exceedance curves, April–June (based on flow data from January 1, 1979 to December 1, 2015).



Source: USGS (2016, as modified by Great River Hydro)

Figure B-3. Flow exceedance curves, July–September (based on flow data from January 1, 1979 to December 1, 2015).



Source: USGS (2016, as modified by Great River Hydro)

Figure B-4. Flow exceedance curves, October–December (based on flow data from January 1, 1979 to December 1, 2015).

B2.4 Area-Capacity Curve

The impoundment has a surface area of 2,804 acres and a total maximum total volume of 26,900 acre-feet (acre-ft) at El. 291.63 ft (National Geodetic Vertical Datum of 1929 [NGVD29]) at the top of the stanchion boards. The overall operating range of the Project, accounting for both low inflow and most high inflow conditions, is typically between El. 288.63 ft and 291.63 ft, providing about 7,476 acre-ft of storage in the 3-ft range. The storage volume associated with the typical operating range, under non-spill conditions, between El. 289.6 ft and El. 291.4 ft is 4,642 acre-ft, or 62 percent of the overall usable storage. The stage versus storage values are shown in Table B-3 and plotted in Figure B-5.

Table B-3. Stage versus storage curve.

Elevation (ft NGVD29)	Approximate Storage (acre-ft)
284	11,194
285	12,696
286	14,353
287	16,166
288	18,151
289	20,317
290	22,684
291	25,259
291.6	26,900

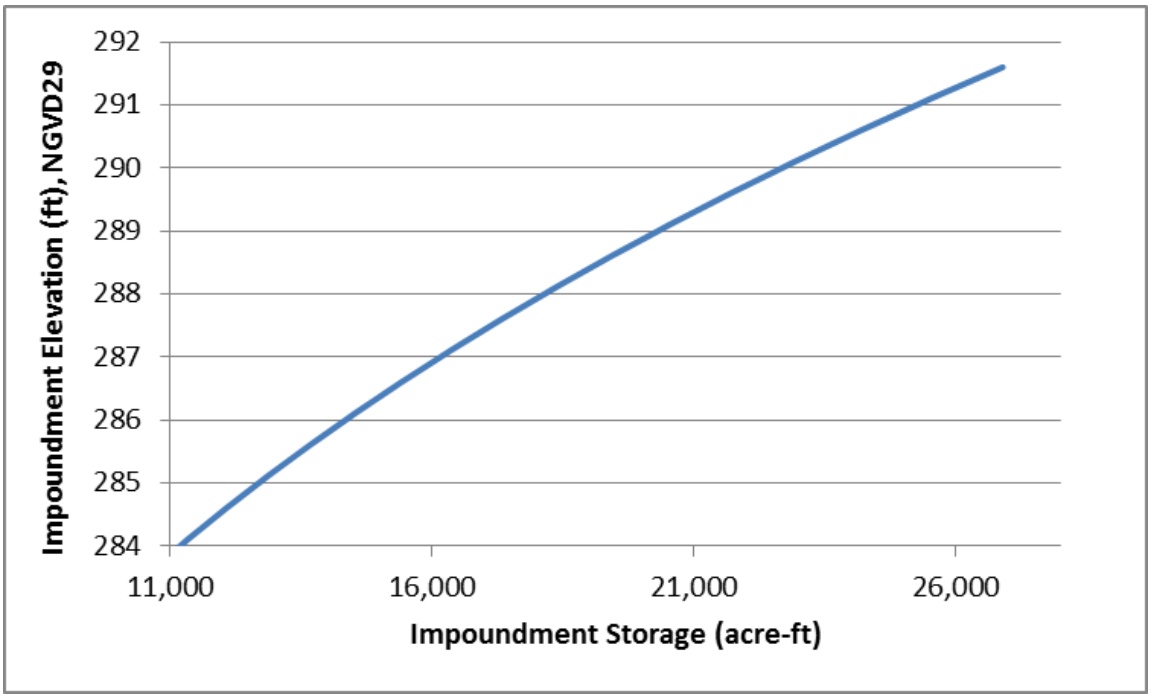


Figure B-5. Area-capacity curve.

B2.5 Hydraulic Capacity

The estimated maximum hydraulic capacity of Unit Nos. 1, 2, and 3 is 3,670 cfs each at 57 ft of head. The Project maximum hydraulic capacity (calculated as the sum of each individual unit's maximum discharge capacity) is therefore 11,010 cfs at 57 ft of head.

The estimated minimum hydraulic capacity of Unit Nos. 1, 2, and 3 is 700 cfs each for a total Project minimum hydraulic capacity of 2,100 cfs.

B2.6 Tailwater Rating Curve

The Project discharges directly into the Connecticut River. The normal tailwater elevation is El. 229.0 ft. The tailwater curve data represent the stage discharge relationship for discharge from the dam, spillway, and powerhouse at a location just downstream of the confluence of the bypassed reach with the powerhouse canal. The tailwater rating values are shown in Table B-4 and plotted in Figure B-6.

Table B-4. Tailwater rating curve.

Tailwater Elevation (ft NGVD29)	Flow (cfs)
211.4	0
229.3	10,000
232.9	20,000
235.9	30,000
238.6	40,000
240.9	50,000
243.1	60,000
245.0	70,000
246.9	80,000
248.7	90,000
250.4	100,000
263.6	200,000
274.2	300,000
283.9	400,000

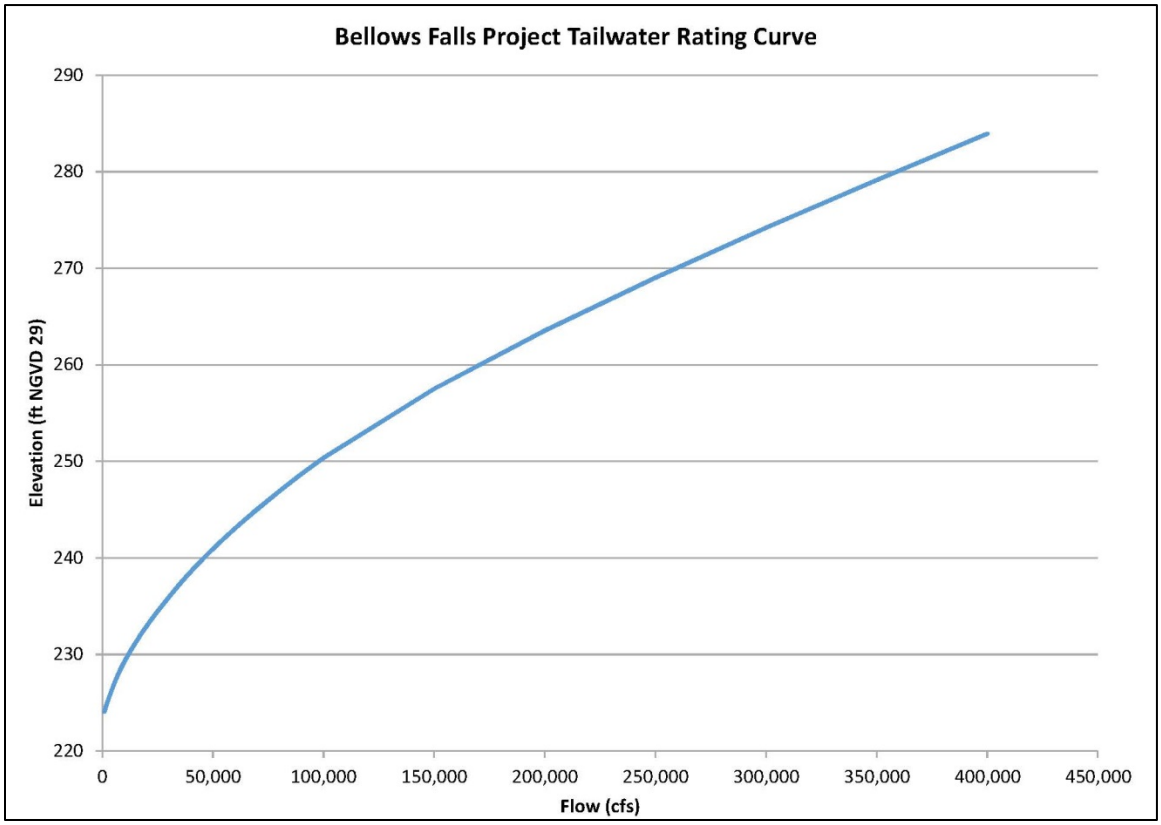


Figure B-6. Tailwater rating curve.

B2.7 Powerplant Capability

Powerplant capability is the Project's output in MW over a range of gross heads, depicted in Figure B-7.

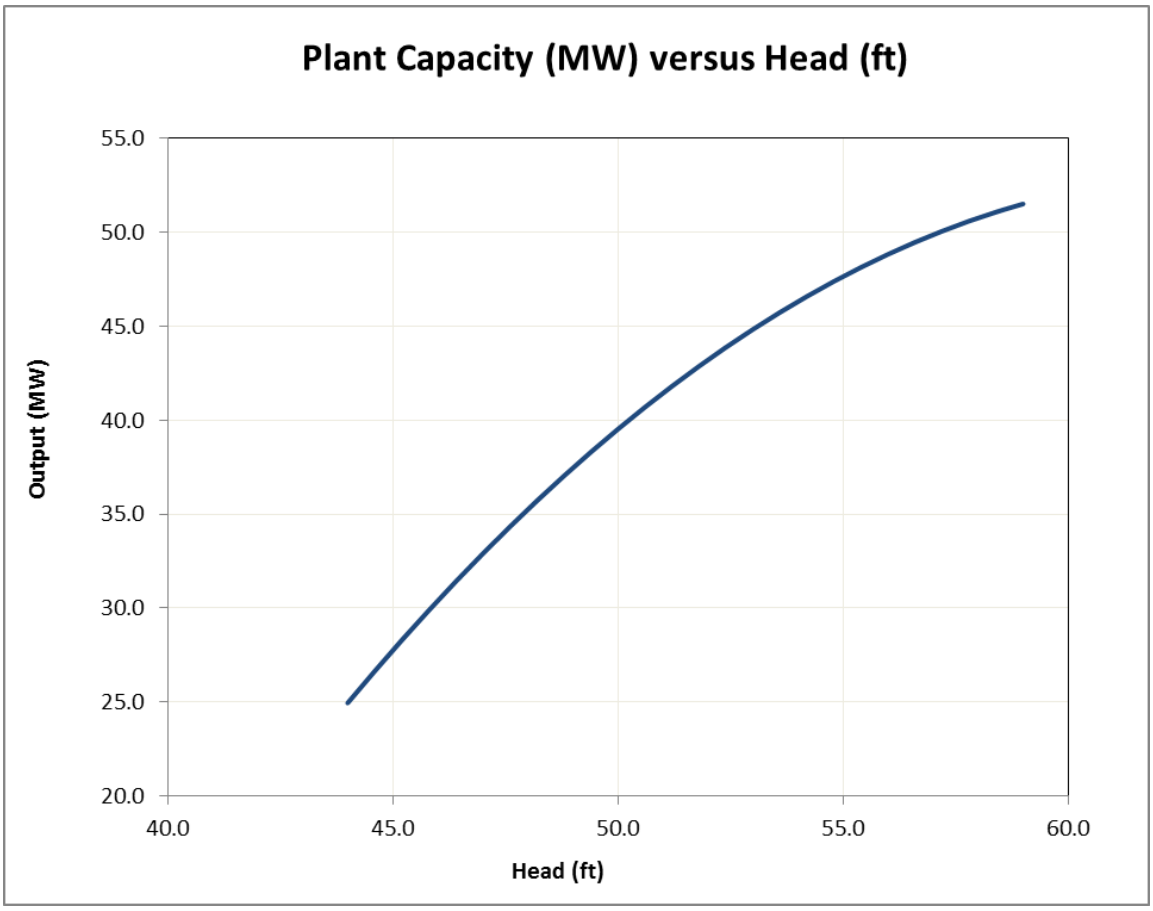


Figure B-7. Powerplant capability.

B3 Utilization of Project Power

The Project is located in the regional electric system that is operated by ISO-NE, which supplies electric power to the New England states. ISO-NE is responsible for regional grid operation, dispatch of generation, wholesale market administration, and power system analysis and planning to ensure that system reliability and adequate generation and transmission resources are available to meet regional needs. ISO-NE prepares both short- and long-term projections of electricity supply and demand. The *2016–2025 Forecast Report of Capacity, Energy, Loads, and Transmission* projects annual increases of 0.9 percent in summer peak demand, 0.6 percent in winter peak demand, and 0.8 percent in annual energy use from 2016 to 2025 (ISO-NE, 2016).

As stated in Section B2.1 the Project has the capability of producing 49.0 MW and 247,373 MWh annually, on average, to the regional power grid. The Project uses approximately 0.681 MWh annually for station service. In addition, the Island Corporation holds the rights to 300 kW of power from the Bellows Falls Project dating back to a 1914 lease indenture between the predecessor companies of Great River Hydro and Island Corporation.[1]

Over the term of the new license, the Project will continue to directly provide renewable power and can support and facilitate the further penetration of additional variable energy (wind and solar) resources into the region through reserve capacity and grid stability functionality. Project generation displaces fossil-fired generation, reduces power plant emissions, and provides substantial environmental benefit. The Project also provides forward capacity, real-time reserves, and voltage-ampere-reactive (VAR)[2] support within the ISO-NE power pool.

B4 Plans for Future Development

Great River Hydro has no specific plans for future efficiency improvements, incremental development, or re-development of the Project.

B5 Literature Cited

ISO-NE (New England Independent System Operator). 2016. ISO New England CELT report – 2016–2025 forecast report of capacity, energy loads and transmission. May 2, 2016. Available at: https://www.iso-ne.com/system-planning/system-plans-studies/celt/?document-type=CELT%20Reports&publish-date=[2016-01-01T00:00:00Z%20TO%20*. Accessed March 21, 2017.

USGS (U.S. Geological Survey). 2016. National Water Information System web page, Water data for the Nation. Available at: http://nwis.waterdata.usgs.gov/nwis. Accessed March 21, 2017.

[1] See Island Corp. Motion to Intervene dated December 29, 2016 (FERC accession number 20161229-5107).

[2] Voltage is regulated through reactive power production and consumption, and resources on the grid may be compensated for providing this reactive power capability. Voltage-ampere-reactive (VAR) is the unit of measurement for reactive power.

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Final Application for New License for
Major Water Power Project — Existing Dam

Bellows Falls Project (FERC No. 1855)

EXHIBIT C: CONSTRUCTION HISTORY AND PROPOSED CONSTRUCTION

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TABLE OF CONTENTS

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EXHIBIT C: CONSTRUCTION HISTORY AND PROPOSED CONSTRUCTION

Section 5.18(a)(5)(iii) of Title 18 of the Code of Federal Regulations (CFR) refers to Section 4.51 (License for Major Project—Existing Dam) for a description of information that an applicant must include in Exhibit C of its license application. Exhibit C is a construction history and proposed construction schedule for the Project.

Section 4.51(d) Exhibit C is a construction history and proposed construction schedule for the Project. The construction history and schedules must contain:

(1) If the application is for an initial license, a tabulated chronology of construction for the existing project's structures and facilities described under paragraph (b) of this section (Exhibit A), specifying for each structure or facility, to the extent possible, the actual or approximate dates (approximate dates must be identified as such) of:

(i) Commencement and completion of construction or installation;

(ii) Commencement of commercial operation; and

(iii) Any additions or modifications other than routine maintenance; and

(2) If any new development is proposed, a proposed schedule describing the necessary work and specifying the intervals following issuance of a license when the work would be commenced and completed.

C1 Construction History

This is not an application for an initial license; however, a brief overview of the Project's construction history is provided below.

C1.1 Original Construction

The Bellows Falls Project was originally constructed in 1927 (see Exhibit E, Section 3.10, *Cultural and Historic Resources*). The original license for the Bellows Falls Project was issued jointly to New England Power Company, Bellows Falls Hydro-Electric Corporation, and the Connecticut River Power Company on October 13, 1943. New England Power Company subsequently purchased all of the physical properties and franchise of Bellows Falls Hydro-Electric Corporation and became the Licensee, as authorized by the Federal Power Commission (predecessor to the Federal Energy Regulatory Commission [FERC]) under its Order dated July 9, 1948. The original license expired on June 30, 1970. The Project operated under annual licenses until the license was renewed on August 3, 1979.

C1.2 Modifications/Additions to the Project

On October 5, 1978, FERC approved a Settlement Agreement concerning fish passage facilities for Atlantic Salmon at the Bellows Falls Project and at the upstream Wilder Project (No. 1892), and for Atlantic Salmon and American Shad at the downstream Vernon Project (No. 1904). The settlement was executed on December 30, 1977, among the Licensee; the States of Massachusetts, Connecticut, New Hampshire, and Vermont; U.S. Fish and Wildlife Service; and four non-governmental organizations (the Environmental Defense Fund; the Massachusetts Public Interest Research Group, Inc.; For Land's Sake; and Trout Unlimited). The settlement called for staged design, construction and operation of passage facilities at the three Projects; Bellows Falls' construction schedule was dependent upon a trigger number of 30 returning adult salmon to the downstream Holyoke Project (FERC No. 2004). The upstream fish ladder and visitor center with fish ladder viewing windows was subsequently completed and operation began in 1984.

On July 26, 1990, the Licensee entered into a Memorandum of Agreement with the Connecticut River Atlantic Salmon Commission for permanent downstream fish passage facilities for the Wilder, Bellows Falls, and Vernon Projects. A downstream fish diversion boom located in the canal forebay was installed in 1996, and downstream passage is provided via the forebay trash/ice sluice skimmer gate, and by a supplemental sluice pipe.

On February 27, 1998, FERC approved the transfer of the license from New England Power Company to USGen New England, Inc.

Under a multi-license amendment dated November 19, 1998, regional electrical transmission facilities were removed from the Project, including three step-up transformers and adjacent switchyards. At that time, the powerhouse was automated and began operations via remote control from a consolidated hydro operations center in Wilder, Vermont.

On January 21, 2005, FERC approved a change in the Bellows Falls Project boundary to remove a small piece of land with an office building (currently, the Great River Hydro North Walpole office) from the Project. On February 5, 2005, FERC approved another Project boundary change to removed 8.8 acres and historic structures from the Project boundary to facilitate subsequent transfer to the Bellows Falls Historical Society.

On January 24, 2005, FERC approved the transfer of the license to TransCanada Hydro Northeast Inc.

On December 4, 2012, construction was completed on a new generator step-up transformer substation to the west of the powerhouse. Generator leads run overhead by cable tray approximately 180 feet (ft) from the powerhouse to the 6.9-kilovolt (kV) switchgear building. Overhead conductors (6.9 kV) exiting the switchgear building connect with two step-up transformers. Overhead conductors

(115 kV) from the high side of the transformers extend approximately 120 ft to a bus and disconnects. Other electrical equipment is owned by the regional transmission company, New England Power Company, doing business as National Grid. Three oil-filled transformers located adjacent to the downstream face of the powerhouse, also owned by New England Power were retired from service and removed from the Project area. The substation was placed into service on August 20, 2013.

Under a Purchase and Sale Agreement, dated November 1, 2016, Great River Hydro NE, LLC agreed to acquire all of the equity interests in TransCanada Hydro Northeast Inc. On January 10, 2017 FERC authorized the transaction under Section 203(a)(1)(A) of the Federal Power Act (158 FERC ¶62,019). In furtherance of the acquisition, the licensee was converted to a limited liability company. Accordingly, the licensee applied for FERC approval to transfer the licenses for Project Nos. 1855 (Bellows Falls), 1892 (Wilder), 1904 (Wilder), 2077 (Fifteen Mile Falls) and 2323 (Deerfield River) from TransCanada Hydro Northeast Inc. to TransCanada Hydro Northeast LLC. On February 22, 2017, FERC approved the transfer of the licenses to TransCanada Hydro Northeast LLC, pending submittal of evidence of the conversion and the signed acceptance sheet (158 FERC ¶62,119). On April 18, 2017, TransCanada Hydro Northeast LLC filed the acceptance sheet and evidence of the conversion as required by the February 22, 2017 Order. The transaction closed on April 19, 2017.

On April 19, 2017, TransCanada Hydro Northeast LLC was renamed Great River Hydro, LLC and provided written notice of the name change to FERC by filing dated April 24, 2017 so that FERC could revise its records to accurately reflect the name change of the licensee of the Project as Great River Hydro, LLC.

C2 Schedule for Proposed Project Development

Great River Hydro is not proposing any new construction or new development at the Bellows Falls Project at this time.

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Final Application for New License for
Major Water Power Project — Existing Dam

Bellows Falls Project (FERC No. 1855)

EXHIBIT D: STATEMENT OF PROJECT COSTS AND FINANCING

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TABLE OF CONTENTS

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LIST OF TABLES

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EXHIBIT D: PROJECT OPERATIONS AND RESOURCE UTILIZATION

Section 5.18(a)(5)(iii) of Title 18 of the Code of Federal Regulations (CFR) refers to Section 4.51 (License for Major Project—Existing Dam) for a description of information that an applicant must include in Exhibit D. Exhibit D is a statement of costs and financing.

D1 Original Cost of the Existing Project

The Bellows Falls Project was previously licensed in 1979 and this Application is for a new license rather than initial license. Federal Energy Regulatory Commission (FERC) regulations at 18 C.F.R. § 4.51(e)(1) do not require a statement of costs of lands, water rights, structures, or facilities in applications for new licenses.

D2 Amount Payable in the Event of Project Takeover

Section 14 of the Federal Power Act (FPA) reserves to the United States the right to take over a non-publically owned project upon expiration of its license. To date, no agency or interested party has recommended a federal takeover of the Bellows Falls Project. If such a takeover were to occur, Great River Hydro, LLC (Great River Hydro), would be entitled to be reimbursed for its net investment, not to exceed the fair value, of the property taken, plus severance damages suffered (16 United States Code [U.S.C.] § 807). However, the information required by FERC's regulations (18 C.F.R. 4.51(e)(2)) that would be needed to quantify the compensation to be paid to Great River Hydro pursuant to Section 14 is provided below.

D2.1 Fair Value

The FPA does not define the term "fair value"; however, for the purpose of this Application, Great River Hydro will rely upon a historical cost basis (not depreciated) as of December 31, 2016, of $90,475,201 as the estimate of fair market value of the Bellows Falls Project.

D2.2 Net Investment

The FPA generally defines a Licensee's net investment in a project as the original cost of the project, plus additions and betterments, minus depreciation and other amounts (16 USC § 796(13)). For the purpose of this Application, net investment is represented as the net book value of the Bellows Falls Project, equal to $70,963,000 as of December 31, 2016.

D2.3 Severance Damages

Under Section 14 of the FPA (16 USC § 807(a)) "severance damages" are those "reasonable damages, if any, to property of the licensee valuable, serviceable, and [which is then] dependent [for its usefulness upon the continuance of the license] but not taken" in the event of a federal takeover. All Project structures, facilities, equipment, and contractual obligations or requirements are required for the successful operation of the Bellows Falls Project; therefore, Great River Hydro estimates that there would not be any severance damages.

D3 Estimated Capital Cost of New Development

Great River Hydro has no plans for future development of the Bellows Falls Project.

D4 Estimated Average Annual Cost of the Project

This section describes the estimated annual costs of the Bellows Falls Project. The estimated average annual cost of the total Project (in 2017 dollars) is approximately $10,444,894 based on a 30-year period of analysis. The average annual cost of the Project as proposed includes the annualized values of capital costs, taxes, depreciation and amortization, operations and maintenance costs, as well as capital and operations and maintenance costs associated with proposed protection, mitigation, and enhancement (PM&E) measures. Capital costs also include life cycle costs over the course of a 30-year analysis such as runner replacements, generator rewinds, and oil circuit breaker replacements and routine replacement of vehicles and tools. Under the no-action alternative and Great River Hydro's proposed action, the Project will continue to operate as it currently operates. Because Great River Hydro is not proposing any new PM&E measures at this time, no capital or operations and maintenance costs for proposed PM&E measures are included.

D4.1 Cost of Capital

The estimated average annual capital costs for the Bellows Falls Project as currently proposed is $2,300,000 per year. This cost includes life cycle costs such as runner replacements, generator rewinds, and oil circuit breaker replacements and routine replacement of vehicles and tools.

D4.2 Local, State, and Federal Taxes

As a limited liability company, income tax liabilities associated with Great River Hydro are passed through to the owners. Therefore no state or federal taxes are listed in this section. Property taxes for the Bellows Falls Project are paid to the local municipalities. Property taxes are estimated to be $4,290,000 for 2017.

D4.3 Depreciation or Amortization

For the purpose of this Application, financial depreciation for the Bellows Falls Project, as for all Great River Hydro generating assets, is assumed to be straight-line over a 30-year period of analysis. Estimated 2017 depreciation expenses are $1,643,142.

D4.4 Operation and Maintenance Expenses

The estimated annual operation and maintenance expense for 2017 at the Bellows Falls Project is approximately $2,211,752. This cost is based on estimates developed by Great River Hydro, and historical TransCanada expenses associated with the Project. These costs do not include estimated operations and maintenance costs associated with potential alternatives other than Great River Hydro's current proposal.

D5 Estimated Annual Value of Project Power

Project energy is sold into the New England Independent System Operator (ISO-NE) regional market on a day-ahead and real-time basis at the prices that clear for each generating facility. Capacity commitments are priced through a regional Forward Capacity Auction process. The Bellows Falls Project also receives revenue for providing ancillary services to the regional system. Table D-1 summarizes estimated revenues from energy production, capacity, and ancillary services based on 2016 prices and 10-year average generation. The total estimated annual valuation of Project power is $10,791,057 or $43.62/MWh.

Table D-1. Valuation of annual Project output.

Revenue Source	Value
On-peak Energy	$3,847,877
Off-peak Energy	$3,696,990
Forward Capacity	$2,963,367
Real-time Reserves	$259,358
Volt-ampere-reactive support	$23,455
Total Value	$10,791,057
Total Value per MWh	$43.62

D6 Sources and Extent of Financing and Annual Revenues

Capital projects are financed using cash flow from operations and as necessary, additional debt obligations or equity injections. Based on the value of Project power described in Section D5, the Bellows Falls Project will have adequate financial resources to meet the costs of operations for the term of the new license.

D7 Estimated Cost to Develop License Application

Because additional analysis based on recently filed study reports is likely, it is anticipated that an amended Final License Application (FLA) will be prepared. The revised estimated cost to develop the Bellows Falls Project License Application, including those costs is approximately $4,300,000.

D8 On-peak and Off-peak Value of Project Power

The average annual price in 2016 for on-peak Bellows Falls Project power was $35.84/MWh. The real-time off-peak price was $25.16/MWh. Prices are annual average, location-specific prices from ISO-NE at Node 335 based on the full 2016 calendar year and are anticipated to be reasonably reflective of 2017 prices. Pricing nodes are specific locations on the transmission system for which the ISO-NE calculates and publishes wholesale electricity prices. Each is related to one or more of the power grid's electrical buses—specific components at which generators, loads, or the transmission system are connected. This location-specific pricing helps give market participants a clear and accurate signal of the price of electricity at every location on the grid.

D9 Estimated Average Annual Change in Project Generation and Value of Project Power Due to Changes in Project Operation

Great River Hydro is not proposing any changes in Bellows Falls Project operation at this time, therefore, project generation and the value of Project power will not change. Project generation and value of power could change under an amended FLA in which potential alternatives to the current Great River Hydro proposal may be presented.

Final Application for New License for
Major Water Power Project — Existing Dam

Bellows Falls Project (FERC No. 1855)

EXHIBIT F: GENERAL DESIGN DRAWINGS AND SUPPORTING DESIGN REPORT (PUBLIC VERSION)

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EXHIBIT F: GENERAL DESIGN DRAWINGS

Section 5.18(a)(5)(iii) of Title 18 of the Code of Federal Regulations (CFR) refers to Section 4.51 (License for Major Project—Existing Dam) for a description of information that an applicant must include in Exhibit F of its license application. Exhibit F consists of general design drawings of the principal project works described under section 4.41(b) (Exhibit A) and supporting information used to demonstrate that existing project structures are safe and adequate to fulfill their stated functions.

F1 General Design Drawings for Existing Project Features

Exhibit F consists of general design drawings of the principal Project works. These Exhibit F design drawings are filed separately in the final license application, and Great River Hydro, LLC (Great River Hydro), requests that they be treated as Critical Energy Infrastructure Information (CEII) under Federal Energy Regulatory Commission (FERC) regulations at 18 CFR § 388.112.

Only the list of general design drawings is included in this public version of Exhibit F.

Table F1-1. List of general design drawings.

Exhibit No.	Sheet No.	Title
F-1	Sheet 1D	General Layout of Plant
F-2	Sheet 2B	General Layout of Dam & Spillway
F-3	Sheet 3B	Spillway-Assembly Sections
F-4	Sheet 4D	Plan and Details of Canal
F-5	Sheet 5D	Powerhouse and Switchyards
F-6	Sheet 6D	Detail Plan of Powerhouse
F-7	Sheet 7C	Cross Section of Powerhouse
F-8	Sheet 8A	Fish Passage Facilities General Plan
F-9	Sheet 9A	Fish Passage Facilities General Plan
F-10	Sheet 10A	Fish Passage Facilities Sections
F-11	sheet 11A	Fish Passage Facilities Sections
F-12	Sheet 12A	Fish Passage Facilities: Downstream Fish Migration General Arrangement - Plan
F-13	Sheet 13A	Fish Passage Facilities Details

F2 Supporting Design Report

Sections 4.41(g)(3)and (4) require that an applicant file with FERC two copies of a Supporting Design Report when the applicant files a license application. The purpose of the Supporting Design Report is to demonstrate that existing and proposed structures are safe and adequate to fulfill their stated functions.

Great River Hydro hereby requests waiver of the Commission's requirement to include a Supporting Design Report in Section F-3 of Exhibit F (18 CFR § 4.41(g)(3)) because the most recent (6^{th}) Part 12 Independent Dam Safety Inspection Report (filed November 9, 1992) fulfills the requirements of the regulations for filing a Supporting Design Report as part of the application for new license. All of the Project's Independent Dam Safety Inspection Reports are on file with FERC. On August 8, 1997 FERC granted an exemption from future Part 12 inspections based on an assessment and documentation provided to FERC demonstrating that the Bellows Falls Project has low hazard potential.

Final Application for New License for Major Water Power Project — Existing Dam

Bellows Falls Project (FERC No. 1855)

EXHIBIT G: PROJECT AREA MAPS

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EXHIBIT G: MAPS OF LOCATION, BOUNDARY, FEDERAL LANDS, AND NONFEDERAL LAND OWNERSHIP

Section 5.18(a)(5)(iii) of Title 18 of the Code of Federal Regulations (CFR) refers to Section 4.51 (License for Major Project—Existing Dam) for a description of information that an applicant must include in Exhibit G of its license application. Exhibit G contains a set of Project maps that conform to requirements stated in Section 4.39.

G1 Project Area Maps

Exhibit G drawings are maps of the Project area showing the existing FERC Project boundary for the current license. No tentative boundary is indicated because there are no proposed developments and there are no other adjustments to the boundary.

G1.1 Federal Lands

No federal lands are located within the Project boundary.

G1.2 Non-Federal Lands

The Exhibit G drawings identify lands that Great River Hydro, LLC (Great River Hydro), owns in fee, and lands over which Great River Hydro has acquired, or plans to acquire rights to occupancy and use other than fee title, including rights acquired or to be acquired by easement or lease. These drawings are electronically filed separately as large format documents and Project boundary files as ArcGIS files (in zipfile format).

G2 Exhibit G Drawings

The Exhibit G drawings and Project boundary description tables are identified as shown in Table G2.1.

Table G2-1. Exhibit G drawings.

Exhibit No.	Sheet No.	Title
G-1	Sheet 1	Exhibit G: Bellows Falls Project – No. 1855 (Plant Area)
G-2	Sheet 2	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-3	Sheet 3	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-4	Sheet 4	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)

Exhibit No.	Sheet No.	Title
G-5	Sheet 5	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-6	Sheet 6	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-7	Sheet 7	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-8	Sheet 8	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-9	Sheet 9	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-10	Sheet 10	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-11	Sheet 11	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-12	Sheet 12	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-13	Sheet 13	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-14	Sheet 14	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-15	Sheet 15	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-16	Sheet 16	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-17	Sheet 17	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-18	Sheet 18	Exhibit G: Bellows Falls Project – No. 1855 (Project Boundary Sheet)
G-19	Pages 1-11	Bellows Falls Project, P-1855 - Project Boundary Description table

Final Application for New License for
Major Water Power Project — Existing Dam

Bellows Falls Project (FERC No. 1855)

EXHIBIT H: PLANS AND ABILITY OF APPLICANT TO OPERATE PROJECT EFFICIENTLY FOR RELICENSE

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TABLE OF CONTENTS

LIST OF FIGURES

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EXHIBIT H: PLANS AND ABILITY OF APPLICANT TO OPERATE PROJECT EFFICIENTLY FOR RELICENSE

Section 5.18(a)(5)(iii) of Title 18 of the Code of Federal Regulations (CFR) describes information that an applicant for a new license (License for Major Project—Existing Dam) must include in Exhibit H of its license application. Exhibit H contains the miscellaneous information specified in the regulation.

H1 Efficiency and Reliability

The purpose of the Bellows Falls Project is to generate power and ancillary services for sale to the wholesale electric power market. Great River Hydro has a long-term commitment to maximizing the hydroelectric power on the Connecticut River. While seeking to maximize power production, Great River Hydro also has a long-term commitment to preserving the environmental resources of the area. Great River Hydro believes that continued operation of the Bellows Falls Project maximizes the public benefit provided by the Project.

Great River Hydro has operated the Bellows Falls Project since the [former]licensee, TransCanada Hydro Northeast LLC was acquired by Great River Hydro NE, LLC on April 19, 2017 as explained in the cover letter accompanying this application. All of the management and operating personnel of the prior licensee have continued with Great River Hydro. Great River Hydro personnel have decades of experience operating these and other hydroelectric assets in the United States.

H1.1 Increase in Capacity or Generation

No additional capacity or generation for the Bellows Falls Project is proposed.

H1.2 Project Coordination with Other Water Resources Projects

Operation of the Bellows Falls Project is coordinated with other Great River Hydro hydroelectric generating facilities on the Connecticut River, taking into consideration variations in demand for electricity, natural flow variations, intermediate tributary inflow, federal flood control projects and travel time for dispatched flows between hydro projects to maximize the efficient use of available water. Estimated and anticipated inflow forms the basis for bidding into the New England Independent System Operator's (ISO-NE) day-ahead energy market. Day-ahead hourly bids reflect must-run generation periods associated with minimum flow periods; periods when sustained higher flows are anticipated; and opportunistic generation when inflow and available storage allows response to anticipated high electricity demand. When inflows are less than maximum generating capacity, Great River Hydro uses the limited impoundment storage at the Project to dispatch generation as required to meet the generation schedule managed by the ISO-NE. Generation can vary during the course of any day between the required minimum flow and full generating capacity, if flows are

available. Over the course of a day, the Project generally passes the average daily inflow. During periods of sustained high flows, Great River Hydro dispatches Project generation in a must-run status to use available water for generation. Once flows exceed powerhouse capacity, it operates the Project in a "river profile" manner. Communication with downstream hydro projects and upstream tributary flood control projects facilitates coordination among all parties when managing for flood flows.

Great River Hydro is proposing to continue the current mode of operation.

H1.3 Project Coordination with Other Electric Systems

All power generated by the Bellows Falls Project is sold into the wholesale electric power market. The coordination and dispatch of the power is controlled by the ISO-NE of the New England Power Pool (NEPOOL) based upon the prices offered to the market and the demands for services.

With industry restructuring and in response to the Federal Energy Regulatory Commission's (FERC) open access requirements in Order No. 888, NEPOOL has undertaken certain reforms. A key element of this reform is the transfer of control over the region's transmission grid to an ISO that is responsible for the operation of the NEPOOL Control Area in addition to the administration of the new competitive wholesale electric markets. As the power pool operator, ISO-NE directs and coordinates the operation of virtually all of the region's major generation and transmission facilities to meet the operating rules and criteria of the North American Reliability Council. Peaking hydropower operations are particularly important to two ancillary services important to reliability: load following and system protection.

H2 Licensee's Need for the Project

Great River Hydro does not directly use Bellows Falls Project output. Project output is sold into the wholesale electric power market.

The Bellows Falls Project is located in the regional electric system that is operated by the ISO-NE and that supplies electric power to the New England states. ISO-NE is responsible for regional grid operation and dispatch of generation, wholesale market administration, and power system analysis and planning to ensure system reliability and adequate generation and transmission resources to meet regional needs. ISO-NE prepares both short- and long-term projections of electricity supply and demand. The 2016–2025 Forecast Report of Capacity, Energy, Loads, and Transmission projects annual increases of 0.9 percent in summer peak demand, 0.6 percent in winter peak demand, and 0.8 percent in annual energy use from 2016 to 2025 (ISO-NE, 2016).

The Bellows Falls Project provides 40,800 kilowatts (kW) of authorized capacity and on average 247,373 annual megawatt-hours (MWh) to the regional power grid, 126,127 MWh during peak hours and 121,156 MWh during off-peak hours. In New

England, peak hours are defined as the hours between 7:00 a.m. and 11:00 pm on non-holiday weekdays. Off-peak hours in New England are weekday hours between 11:00 p.m. and 7:00 a.m., all day Saturdays, Sundays, and six holidays: January 1st, Memorial Day, July 4th, Labor Day, Thanksgiving, and Christmas. Over the term of the new license, the Project will continue to provide renewable power and support variable energy resources (VERs) through reserve capacity, thereby displacing fossil-fired generation and reducing power plant emissions by over 137,000 tons of CO_2 that otherwise would be emitted from a natural gas generating station and thus creating an environmental benefit. The Project also provides forward capacity, real-time reserves, voltage-ampere reactive (VAR) support[1] within the ISO-NE power pool.

The New England regional electric system is experiencing an increased penetration of VERs into the energy mix. These resources are by definition variable and can affect real-time power supply and grid stability. Bellows Falls Project's capacity to provide reserved capacity and ancillary services such as real-time reserves and VAR support is both complementary to existing VER's but can facilitate greater penetration of these resources into the energy mix. Emerging energy markets such as "firm renewable energy" or expansion of ancillary services will undoubtedly develop over the course of a new license in response to this changing and presently undefined energy landscape. Therefore, maintaining the flexibility and capability to provide these necessary and complementary hydropower benefits is strategically important to ensuring further VER development in the region.

H2.1 Costs and Availability of Alternative Sources of Power

Great River Hydro does not directly use Bellows Falls Project output. Project output is sold into the wholesale electric power market. Great River Hydro does not have retail or wholesale customers that rely on Project output.

H2.2 Effects of Alternative Sources of Power

If the Bellows Falls Project no longer generated energy, the existing mix of peak and off-peak energy, as well as the ancillary services, including load following, capacity, and spinning and non-spinning reserves, would have to be provided by other suppliers to the bulk energy system at market rates.

Peaking hydropower operations are particularly important to system reliability, including the ability to provide load following and system protection.

H2.2.1 Effects on Customers

Great River Hydro has no retail or wholesale customers.

[1] Voltage is regulated through reactive power production and consumption, and resources on the grid may be compensated for providing this reactive power capability. Voltage-ampere reactive (VAR) is the unit of measurement for reactive power.

H2.2.2 Effects on Operating and Load Characteristics

Great River Hydro has no power distribution role other than delivering Project output into the bulk power system of New England and therefore has no load requirements.

The Project does provide ISO-NE with the ability to bring units to the electric grid quickly in the event of a grid disturbance such as loss of a major unit or other load change occurrence.

H2.2.3 Effects on Communities Served

Great River Hydro has no power distribution role and therefore does not serve communities directly. If the Bellows Falls Project no longer generated energy, communities in the region would continue to rely on the existing mix of peak and off-peak energy, as well as the ancillary services, including load following, capacity, and spinning and non-spinning reserves provided by other suppliers to the bulk energy system at market rates.

The operation of the Project has, and will continue to have, a positive effect on local economies in the area. Great River Hydro employs 14 people at the Bellows Falls Project, support teams in nearby offices—8 maintenance technicians, 3 specialists, 2 managers, and 1 administrative staff. It is anticipated that this level of local employment will continue for the foreseeable future. Great River Hydro also has a positive impact on local economies through: outside contracted services that are often locally sourced, provision of recreational access and resources, and property tax payments of over $4.3 million for the Bellows Falls Project.

H3 Cost of Production and Alternative Sources of Power

H3.1 Average Annual Cost of Project Power

Exhibit D includes a detailed estimate, including the basis for the calculations, of Great River Hydro's cost of Project power.

H3.2 Projected Resources to Meet Capacity and Energy Requirements

As stated above, Great River Hydro does not support an electric service territory and, therefore, does not have any electricity capacity or energy requirements. Great River Hydro participates in the ISO-NE forward capacity market and has obligations for providing 48.54 MW's capacity from the Bellows Falls Project through May, 2021.

H4 Effect on Industrial Facility

Great River Hydro does not use the Project power for its own industrial facility.

H5 Indian Tribe Need for Project Electricity

Great River Hydro is not an Indian Tribe.

H6 Effect on Transmission System

The Bellows Falls Project facilities do not include a transmission system. Project Single-line diagrams and Asset Separation drawings designating ownership lines of demarcation are included as Figures H-1 and H-2, and H-3, respectively.

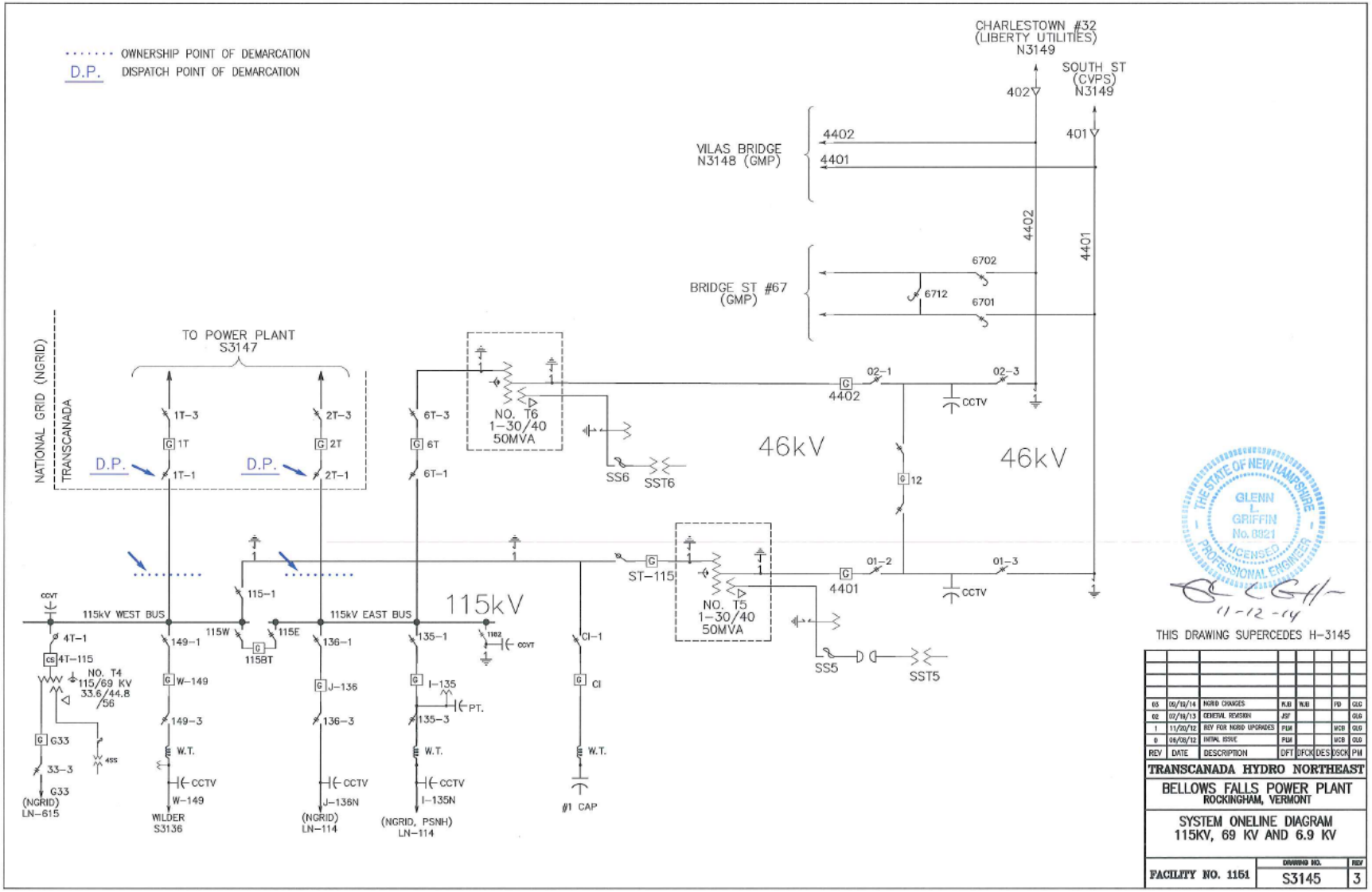

Figure H-1. Transmission interconnection schematic, 115 kV, 69 kV, and 46 kV.

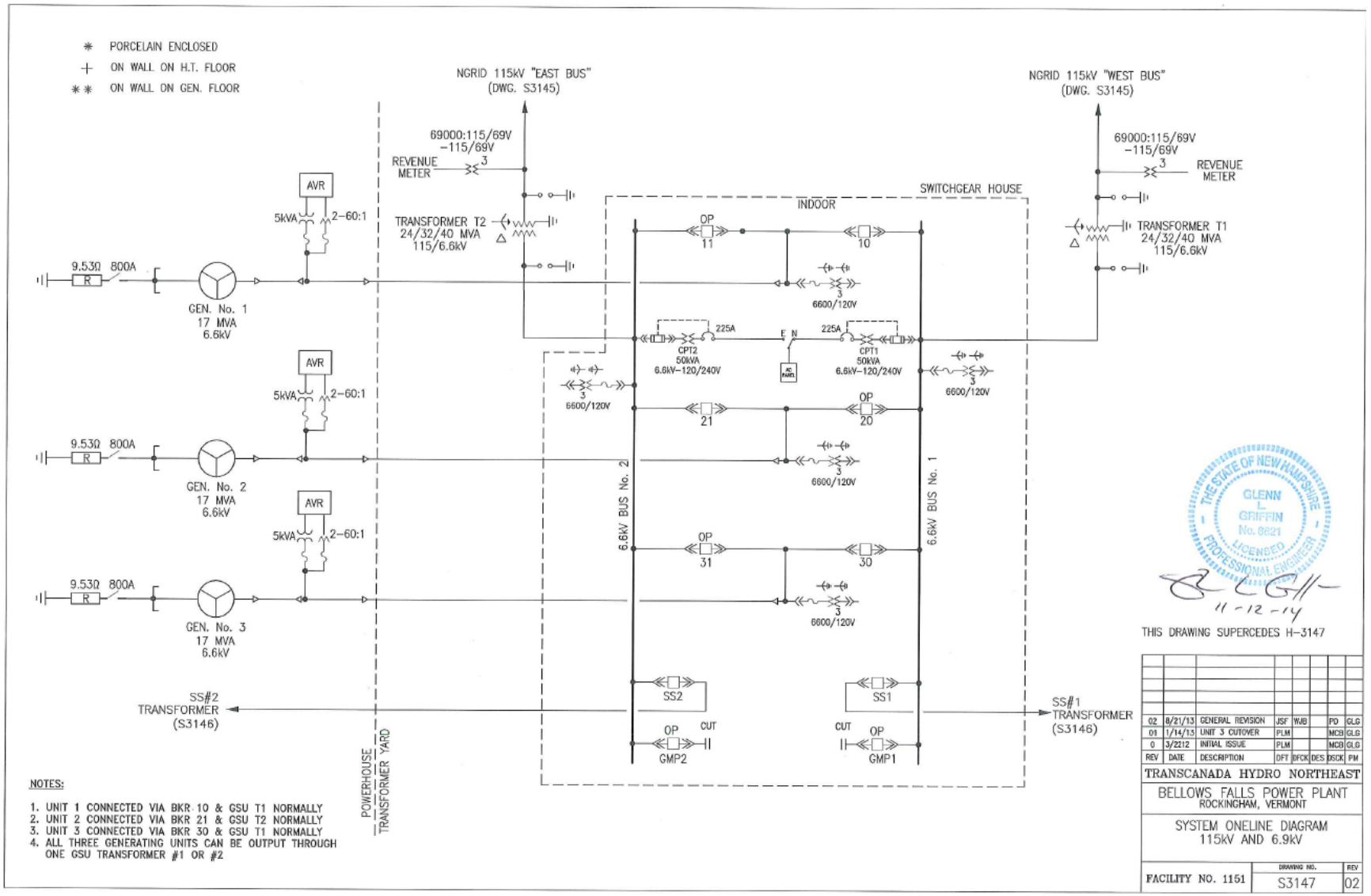

Figure H-2. Transmission interconnection schematic, 115 kV and 6.9 kV.

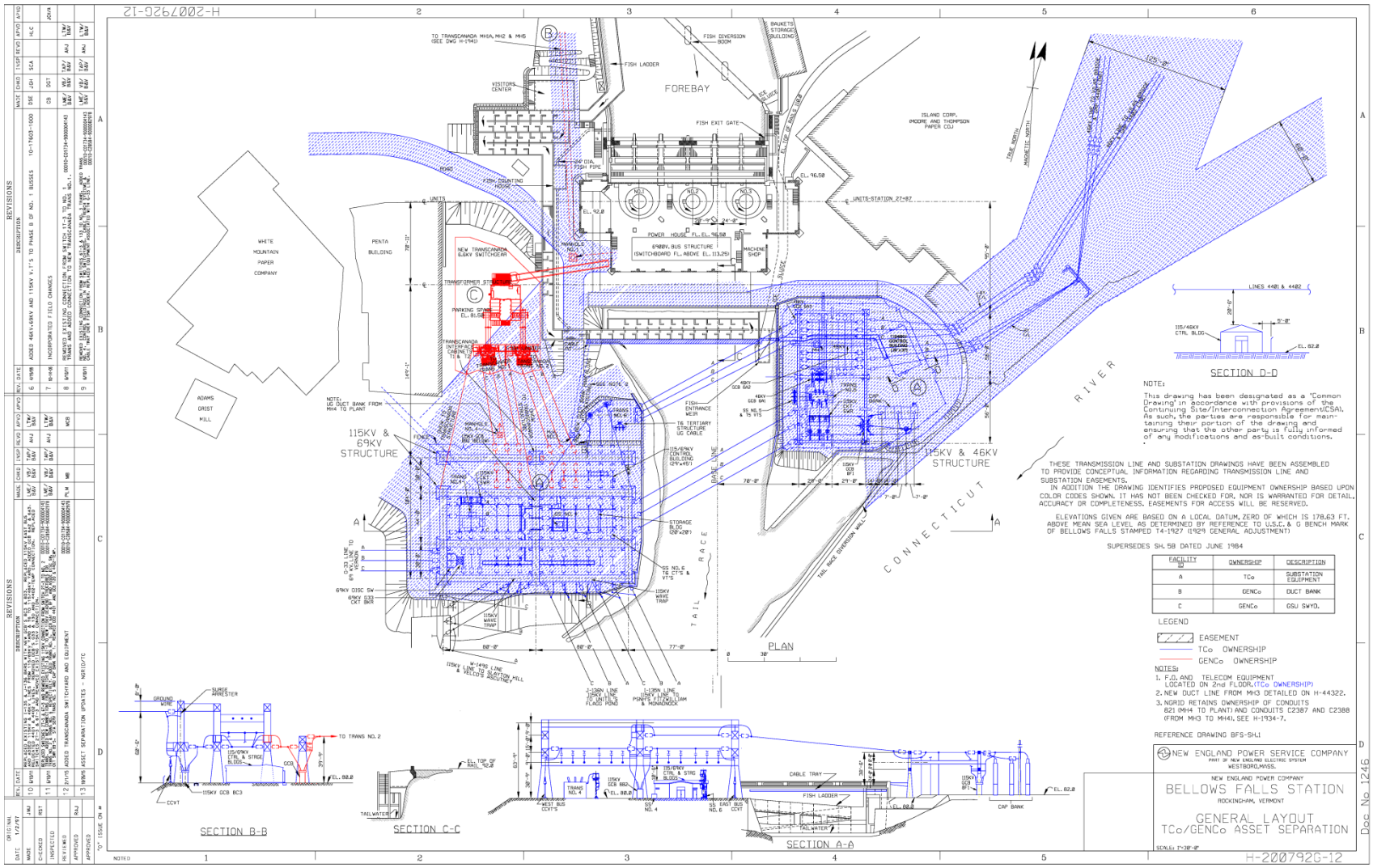

Figure H-3. Asset separation lines of ownership demarcation.

H7 Statement of Need for and Usefulness of Modifications

At this time, Great River Hydro has no plans to modify the generation facilities associated with the Project.

H8 Financial and Personnel Resources

H8.1 Financial Resources

Great River Hydro has sufficient financial resources available to meet its obligations under a new license to operate the Bellows Falls Project.

H8.2 Personnel Resources

Great River Hydro employs personnel resources sufficient to operate, maintain and meet its obligations under a new Bellows Falls Project license. All personnel receive training commensurate with their responsibilities in an ongoing effort to improve their ability to operate the Project in the safest and most efficient manner possible. Great River Hydro also contracts with local outside entities to provide maintenance support for the Project. Training includes topics such as operator and technical trade progression and testing, confined space entry, fall protection, portable fire extinguisher use, HazCom, respiratory protection, lockout/tagout, and FERC dam safety and license compliance. Employees are also trained annually on the site specific EAP, including various role responsibilities and Incident Command System response protocols.

H9 Project Expansion Notification

Great River Hydro currently has no plans to expand the Project to encompass additional lands. The Bellows Falls Project maps provided in Exhibit G indicate the current project boundary.

H10 Electricity Consumption Efficiency Improvement Program

Since Great River Hydro sells all of the Bellows Falls Project output to the wholesale electric power market, the information required by this section is not applicable to the Project.

H11 Indian Tribe Names and Mailing Addresses

There are no Indian Tribes with lands occupied by the Project or which would otherwise be affected by Project relicensing. Tribal groups that have identified themselves as having traditional cultural connections to the Connecticut River Valley in New Hampshire and Vermont consist of the Vermont state-recognized Abenaki Nation, including the Elnu Tribe of the Abenaki, the Nulhegan Band of the Coosuk-Abenaki Nation, the Koasek Traditional Band of the Koas Abenaki Nation,

and the Sovereign Abenaki Nation of Missisquoi. There are no state-recognized Indian Tribes in New Hampshire; however, there are New Hampshire-based Tribal interests in the Upper Connecticut River Valley including the Abenaki Nation of New Hampshire, the Cowasuck Band – Pennacook/ Abenaki People, and the Koasek Traditional Band of the Sovereign Abenaki Nation. FERC has also identified the federally recognized Narragansett Indian Tribe, based in southern Rhode Island as having traditional cultural connections in the region. Addresses are included in the Additional Information accompanying the Initial Statement for this Application.

H12 Safe Management, Operation, and Maintenance of Project

Refer to Exhibit B of the License Application for additional information on management, operation and maintenance beyond what is provided below.

H12.1 Existing and Planned Operation of the Project during Flood Conditions

Information on existing and planned operation of the Project during flood conditions is detailed in Exhibit B of this License Application. Great River Hydro maintains a current EAP that is updated on an annual basis and submitted to the FERC for approval. A “state of readiness” test is conducted annually to verify the communications paths and the contacts listed in Great River Hydro’s EAP. Every 5 years, Great River Hydro conducts a full, functional exercise of one of the Connecticut River project EAP’s that includes all of the facility-related emergency response agencies including state and federal agencies. A complete copy of the Bellows Falls Project's EAP is located at the Bellows Falls Powerhouse. Each of the local Emergency Management Directors has a copy of their sections of the plan. No operational changes are proposed that might affect the existing EAP for the Bellows Falls Project.

H12.2 Warning Devices Used to Ensure Downstream Public Safety

The Bellows Falls Projects public safety warning devices include signage warning of downstream releases, thin ice hazards, portage trails, and signs warning of no boating, swimming, fishing beyond this point. Warning devices also include boat barriers and buoys near spillways. Real-time flow information and day-ahead generation schedules are provided via phone and web-based systems in an effort to alert recreational instream public users of flow conditions at the dam that could affect downstream areas. These measures are specified in the Bellows Falls Project Public Safety Plan filed with the FERC. A field inspection is conducted annually prior to the start of the primary recreation season to ensure measures are in place and functional.

H12.3 Proposed Changes Affecting the Existing Emergency Action Plan

Great River Hydro is currently updating the EAPs for the Connecticut River however, no operational changes are proposed that might affect the existing EAP for the

Bellows Falls Project. Its overall EAP program fully complies with FERC's EAP engineering guidelines.

H12.4 Existing and Planned Monitoring Devices

A Surveillance and Monitoring Plan (SMP) for the Bellows Falls Project is filed with FERC. The purpose of the SMP is to describe the instrumentation and monitoring program for the dam and how the information pertains to and monitors critical dam conditions that relate to potential failure modes and design assumptions for the project structures. The SMP is reviewed with the FERC engineer during the operation inspection of the Project.

H12.5 Project's Employee and Public Safety

Great River Hydro personnel, including history under previous licensees, have an outstanding history of operating the Bellows Falls Project in a work-safe environment. There have been zero lost-time accidents for the past six years at this Project.

Great River Hydro has a commitment to employee safety that begins with compliance with applicable local, state, and federal regulations regarding the safe operation of industrial and electrical facilities. As Great River Hydro operates the Project's generation facilities, this commitment is implemented primarily through a rigorous safety program that includes safety training, inspection and maintenance programs, certification programs, incident reporting and database and root-cause analysis of near-miss safety incidents.

Great River Hydro is committed to maintaining and operating its facilities in a manner that allows the public to safely enjoy recreational activities. The Bellows Falls Project has a Public Safety Plan on file with FERC. It considers a variety of public use and risks on the basis of locations and identifies safety measures implemented to provide adequate warning and safety measures implemented to address the risk and exposure. A field inspection is conducted annually prior to the start of the primary recreation season to ensure measures are in place and functional.

Specific to downstream, in-stream use, real-time flow information is available by telephone (1-800-452-1737) or the "WaterLine" website (www.h2oline.com) providing opportunity flow information for boaters and public safety flow information for anglers that also use areas downstream of the Bellows Falls Project for boating, wading, and fishing.

Records available to Great River Hydro indicate that that Bellows Falls Project has had no public safety incidents tied to operation or maintenance of the Project.

H13 Current Project Operation

Operation of the Project is described in Exhibit B.

H14 History of the Project and Upgrade Programs

A complete Project history is described in Exhibit C.

H15 Generation Lost Over the Last Five Years

There has been one significant unscheduled outage over the last five years occurring in March 2017, in which Unit No.3 was out of service for 12 days. The outage was caused by a servo piston oil leak requiring an overhaul. Lost generation is estimated at approximately 250 MWh.

H16 Compliance with Terms and Conditions of Project License

Great River Hydro and the previous licensee have an excellent record of compliance with the terms and conditions of the current license. A review of records indicates a long-standing history of compliance with all of the license articles and regulations.

H17 Actions Taken by Licensee Affecting Public

Great River Hydro has worked to ensure that actions at the Bellows Falls Project do not negatively affect the public. Great River Hydro plays a prominent role in ensuring the efficient, productive use of water for hydroelectric generation and public use. The Project provides renewable electricity, contributes to the stability of the regional power system, supports the penetration of additional variable energy resources such as wind and solar in to the regional power grid and displaces about 90,000 tons of CO_2 that would otherwise be emitted from a natural gas generation alternative. This significantly affects the general public beyond the public use opportunities the Project provides and supports including boating, fishing, hiking, hunting, and camping. The Project also supports other day-use and overnight-use activities, such multi-day paddling trips, as wildlife viewing and picnicking, and recreational sports areas. In addition to the public use benefits, Great River Hydro contributes to the public benefit through the employment of fulltime and seasonal staff. Great River Hydro educates and trains local communities on its EAP that has assisted and encouraged communities to develop local response plans related to flooding and inundation. Lastly, by contributing nearly$4.3 million in local property tax, Great River Hydro supports community and public services that would otherwise fall on other taxpayers in these communities.

H18 Ownership and Operating Expenses if Project is Transferred

If the Project license were transferred to another entity, Great River Hydro's cost of operating and maintaining the Project (see Exhibit D) would be eliminated.

H19 Annual Fees for Federal or Indian Lands

The Bellows Falls Project is not located on federal or Indian lands.