

ENVIRONMENTAL ASSESSMENT
FOR
HYDROPOWER LICENSE

Taftsville Hydroelectric Project

FERC Project No. 2490-031

Vermont

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

August 2025

EAXX-019-20-000-1728292340

COMMISSION STAFF PAGE LIMIT AND DEADLINE CERTIFICATIONS

I certify that Commission staff has considered the factors mandated by the National Environmental Policy Act (NEPA) and that this environmental document represents a good-faith effort to disclose the most important considerations required by NEPA within the statutory page limit (42 U.S.C. § 4336a(e)) and the statutory deadline (42 U.S.C. § 4336a(g)). This certification reflects staff's expert judgment that the analysis contained within this environmental document is an accurate representation of the potential environmental effects of the proposed action and the analysis is substantially complete. In staff's judgment, any considerations addressed briefly or left unaddressed would not meaningfully inform the assessment of environmental effects.

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ACRONYMS AND ABBREVIATIONS

ADA	American with Disabilities
APE	area of potential effect
BMP	best management practices
CVPS	Central Vermont Public Service Corporation
C.F.R.	Code of Federal Regulations
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
DO	dissolved oxygen
dbh	diameter at breast height
EA	environmental assessment
EIA	U.S. Energy Information Administration
ESA	Endangered Species Act
°F	degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FWS	U.S. Fish and Wildlife Service
GMP	Green Mountain Power Corporation
HPMP	Historic Properties Management Plan
Interior	U.S. Department of the Interior
IPaC	Information for Planning and Consultation
MADF	mean annual daily flow
MW	megawatt
MWh	megawatt-hours
mg/L	milligrams per liter
NEPA	National Environmental Policy Act
NERC	North American Reliability Corporation
National Register	National Register of Historic Places
NHPA	National Historic Preservation Act
NPCC-New England	Northeast Power Coordinating Council's New England region
NLEB	Northern long-eared bat
O&M	operation and maintenance
PA	Programmatic Agreement
PM&E	Protection, mitigation, and enhancement
REA	Ready for Environmental Analysis
RM	river mile
Taftsville Project	Taftsville Hydroelectric Project
USGS	U.S. Geological Survey
Vermont ANR	Vermont Agency of Natural Resources
Vermont DEC	Vermont Department of Environmental Conservation
Vermont DHP	Vermont Division for Historic Preservation
Vermont FWD	Vermont Fish and Wildlife Department
Vermont SHPO	Vermont State Historic Preservation Office
WQC	Clean Water Act section 401 water quality certification

ENVIRONMENTAL ASSESSMENT

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Washington, DC

TAFTSVILLE HYDROELECTRIC PROJECT Project No. 2490-031–Vermont

1.0 INTRODUCTION

1.1 APPLICATION

On August 30, 2022, the Green Mountain Power Corporation (GMP) filed an application for a [subsequent license](#) with the Federal Energy Regulatory Commission (Commission) to continue to operate and maintain the Taftsville Hydroelectric Project No. 2490-031 (Taftsville Project or project).¹ The 0.5-megawatt (MW) project is located on the Ottauquechee River, in Windsor County, Vermont (figure 1). The project generates 1,038 megawatt-hours (MWh) annually. GMP proposes no changes to the project's capacity.

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The purpose of the Taftsville Project is to produce hydroelectric power. Therefore, under the provisions of the Federal Power Act (FPA), the Commission must decide whether to issue a subsequent license to GMP for the Taftsville Project and what conditions should be placed on any license issued. In deciding whether to issue a license for a hydroelectric project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which licenses are issued (such as flood control, irrigation, or water supply), the Commission must give equal consideration to the purposes of: (1) energy conservation; (2) the protection of, mitigation of damage to, and enhancement of fish and wildlife resources; (3) the protection of recreational opportunities; and (4) the preservation of other aspects of environmental quality. Issuing a subsequent license for the project would allow GMP to continue to generate electricity at the project for the term of the license, making electric power from a renewable resource available to the regional electric grid.

¹ The current license for the project was issued to Central Vermont Public Service (CVPS) on September 20, 1994, for a term of 30 years, and expires August 31, 2024. *See* 68 FERC ¶ 62,555 (1994). The license was transferred from CVPS to Green Mountain Power on September 13, 2012 (140 FERC ¶ 62,191(2012)).

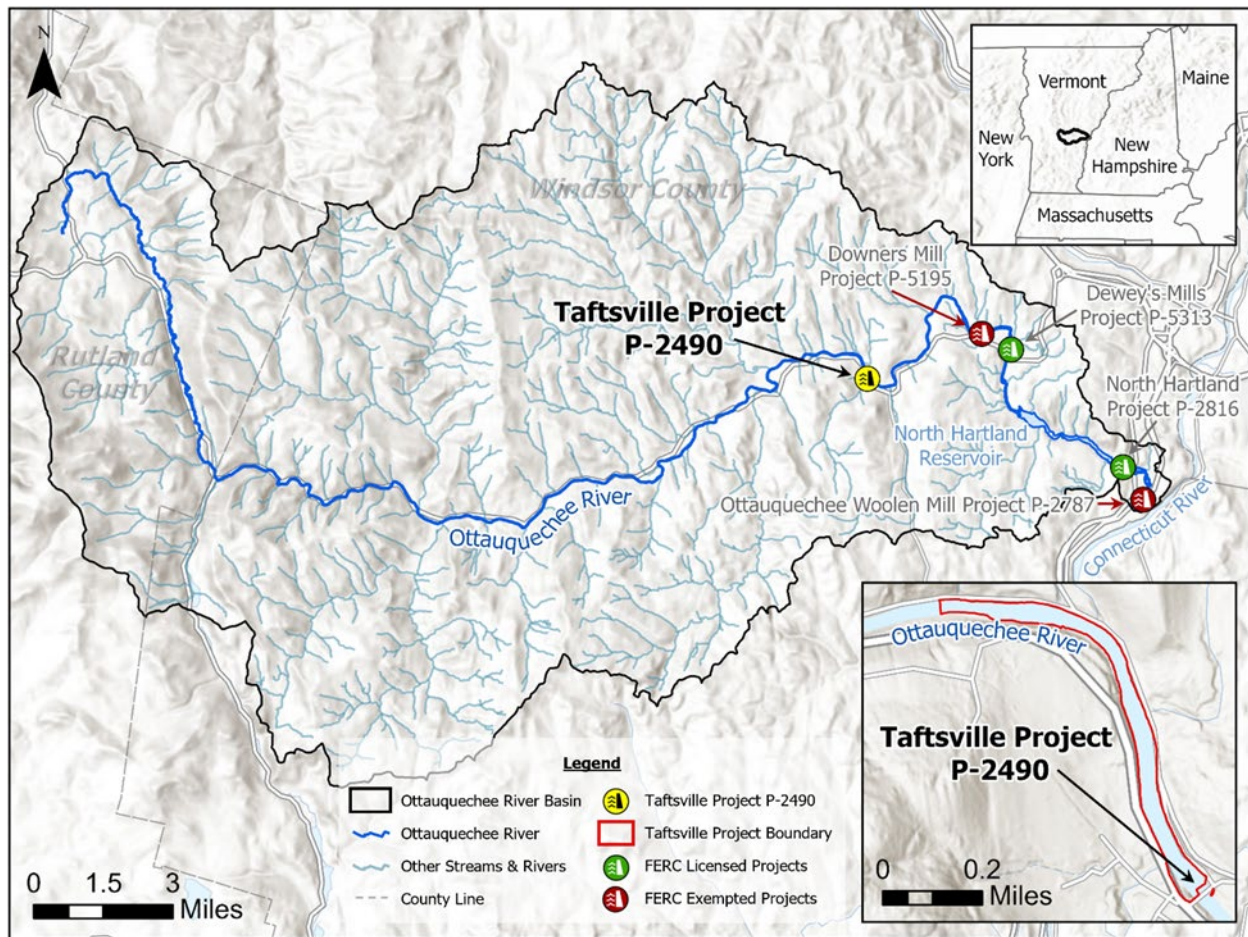


Figure 1. Locations of the Taftsville Project, the project boundary, and other FERC projects in the Ottauquechee River (Source: Commission staff).

We prepared this environmental assessment (EA) in compliance with the requirements of the National Environmental Policy Act (NEPA)² of 1969 and the Commission's implementing regulations [18 Code of Federal Regulations (C.F.R.) part 380], to assess the environmental and economic effects associated with continued operation of the project and identified alternatives. The EA includes recommendations to the Commission on whether to issue a subsequent license, and if so, recommends terms and conditions to become a part of any license issued.

In this EA, we assess the environmental and economic effects of the following alternatives: (1) operating and maintaining the project as proposed by GMP (proposed action); (2) operating and maintaining the project as proposed by GMP, with additional staff recommended measures (staff alternative); (3) the staff alternative with mandatory conditions; and (4) no action. Under the no-action alternative, the project would continue to operate as it

² National Environmental Policy Act of 1969, amended (Pub. L. 91-190. 42 U.S.C. §§ 4321–4347, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, Pub. L. 97-258, §4(b), September 13, 1982, Pub. L. 118-5, June 3, 2023). For tracking purposes under NEPA, the unique identification number for documents relating to this environmental review is EAXX-019-20-000-1728292340.

does under the existing license, and no new environmental protection, mitigation, or enhancement measures would be implemented. The primary issues associated with relicensing the project are the effects of project operation and maintenance on: (1) water quantity; (2) water quality; (3) recreation resources; and (4) cultural resources.

1.2.2 Need for Power

The Taftsville Project provides hydroelectric generation to meet part of the state of Vermont's power, resource diversity, and capacity needs. The project has an authorized installed capacity of 0.5 MW and an average annual energy production of about 1,038 MWh from 2017 through 2021.

To assess the need for power, we looked at the needs in the operating region in which the project is located. The North American Electric Reliability Corporation (NERC) annually forecasts electric supply and demand nationally and regionally for a 10-year period. The Taftsville Project is located within the Northeast Power Coordinating Council's New England region (NPCC-New England) of the NERC. According to NERC's 2024 Long-Term Reliability Assessment for the New England Region, the net internal demand for this region is projected to increase by about 12.5% from 2025 to 2034.

Power generated at the Taftsville Project would continue to help meet the power demand in the NPCC-New England region in the short- and long-term. The project provides power that can displace non-renewable, fossil fuel-fired generation and contributes to a diversified generation mix. Displacing the operation of non-renewable facilities may avoid some power plant emissions and create an environmental benefit.

1.3 STATUTORY AND REGULATORY REQUIREMENTS

The licensing process for the project is subject to numerous requirements under the FPA and other applicable statutes. The major regulatory and statutory requirements are described in [Appendix D, Statutory and Regulatory Requirements](#).

1.4 PUBLIC REVIEW AND COMMENT

The Commission's regulations³ require applicants to consult with appropriate resource agencies, Tribes, and other entities before filing an application for a license. This consultation is the first step in complying with the Fish and Wildlife Coordination Act [16 United States Code (U.S.C.) § 661 *et seq.*], Endangered Species Act (ESA),⁴ National Historic Preservation Act (NHPA),⁵ and other federal statutes. Pre-filing consultation must be completed and documented according to the Commission's regulations.

³ 18 C.F.R. § 16.8.

⁴ 16 U.S.C. § 1536.

⁵ 54 U.S.C. § 306108.

1.4.1 Scoping

Before preparing this EA, we conducted scoping to determine what issues and alternatives should be addressed. We distributed a scoping document 1 to interested agencies and others on May 5, 2023, which was noticed in the *Federal Register* on May 10, 2023.⁶ The U.S. Fish and Wildlife Service (FWS) and Vermont Agency of Natural Resources (Vermont ANR) filed comments on June 5, 2023. A scoping document 2 was issued July 18, 2023.

1.4.2 Interventions

On September 14, 2023, the Commission issued a public notice accepting the license application and setting November 13, 2023, as the deadline for filing protests and motions to intervene. The notice was published in the *Federal Register* on September 19, 2023.⁷ The Vermont ANR filed a notice of intervention on November 7, 2023, and the U.S. Department of Interior (Interior), on behalf of FWS, filed a motion to intervene on November 13, 2023.⁸ None of the interventions oppose relicensing the project.

1.4.3 Comments on the Application

On June 12, 2024, the Commission issued a Ready for Environmental Assessment (REA) Notice setting August 12, 2024,⁹ as the deadline for filing comments, recommendations, terms and conditions, and fishway prescriptions. The notice also established a deadline of September 25, 2024, for GMP to file reply comments. On July 18, 2024, the U.S. Department of the Interior (Interior) filed a request that the Commission reserve its authority to prescribe fishways under section 18 of the FPA in any license issued for the project. On August 12, 2024, the Vermont Agency of Natural Resources (Vermont ANR) filed comments and recommendations for the project.

⁶ 88 Fed. Reg. 30,304 (May 10, 2023).

⁷ 88 Fed. Reg. 64,900 (September 19, 2023).

⁸ Under Rule 214(a)(2) of the Commission's Rules of Practice and Procedure, Vermont ANR and FWS became parties to the proceeding upon the timely filing of their notices of intervention. *See* 18 C.F.R. § 385.214(a)(2).

⁹ The notice established a 60-day period for filing protests and motions to intervene. The Commission's Rules of Practice and Procedure provide that if a filing deadline falls on a Saturday, Sunday, holiday, or other day when the Commission is closed for business, the filing deadline does not end until the close of business on the next business day. 18 C.F.R. § 385.2007(a)(2). Because the 60-day filing deadline fell on a Sunday (i.e., August 11, 2024), the filing deadline was extended until the close of business on Monday, August 12, 2024 (figure 2).

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO ACTION ALTERNATIVE

Under the no-action alternative, the project would continue to operate under the terms and conditions of the current license, and no new environmental protection, mitigation, or enhancement (PM&E) measures would be implemented. We use this alternative to establish baseline environmental conditions for comparison with other alternatives, and to compare the benefits and costs of any measures that might be required under any [new license](#).

2.1.1 Current Project Facilities

The Taftsville Project includes a 220-foot-long by 16-foot-high concrete gravity dam that includes a 194-foot-long spillway section with a crest elevation of 637.12 feet National Geodetic Vertical Datum of 1929.¹⁰ The spillway is topped with 18-inch-high wooden flashboards. The dam with flashboards creates a 4,600-foot-long, 20.5-acre impoundment, with a gross storage capacity of 30 acre-feet at a normal water surface elevation of 638.6 feet. From the impoundment water flows through the project powerhouse or over the dam to a 290-foot-long bypassed reach of the Ottauquechee River. The powerhouse intake is integral with the dam and faced with a 15-foot by 13-foot trashrack with 3-inch clear bar spacing. From the intake water passes through a 36-foot-long concrete penstock to a concrete and brick powerhouse containing one 0.5-MW vertical Kaplan generating unit. Water exits the powerhouse to a 200-foot-long tailrace section that joins the Ottauquechee River (figure 2).

Electricity generated at the powerhouse is transmitted to the regional grid via a 40-foot-long transmission line, which connects the powerhouse to a step-up generator located at the Distribution Sub-station. Additionally, a second sub-station, the Transmission West Station is also within the project boundary.

The project also includes recreation facilities consisting of: (1) a parking area upstream of the dam, on the west bank, with room for eight vehicles plus an ADA parking spot; (2) a picnic area, viewing platform, and bank fishing area on the west shore of the impoundment just upstream of the dam; and (3) a 500-foot-long canoe portage on the east shore of the impoundment with a canoe put-in, cartop boat launch, and take out area. Informal parking for the canoe put-in is available along the road (figure 2).

¹⁰ All elevations in this document are in National Geodetic Vertical Datum of 1929, unless otherwise noted.

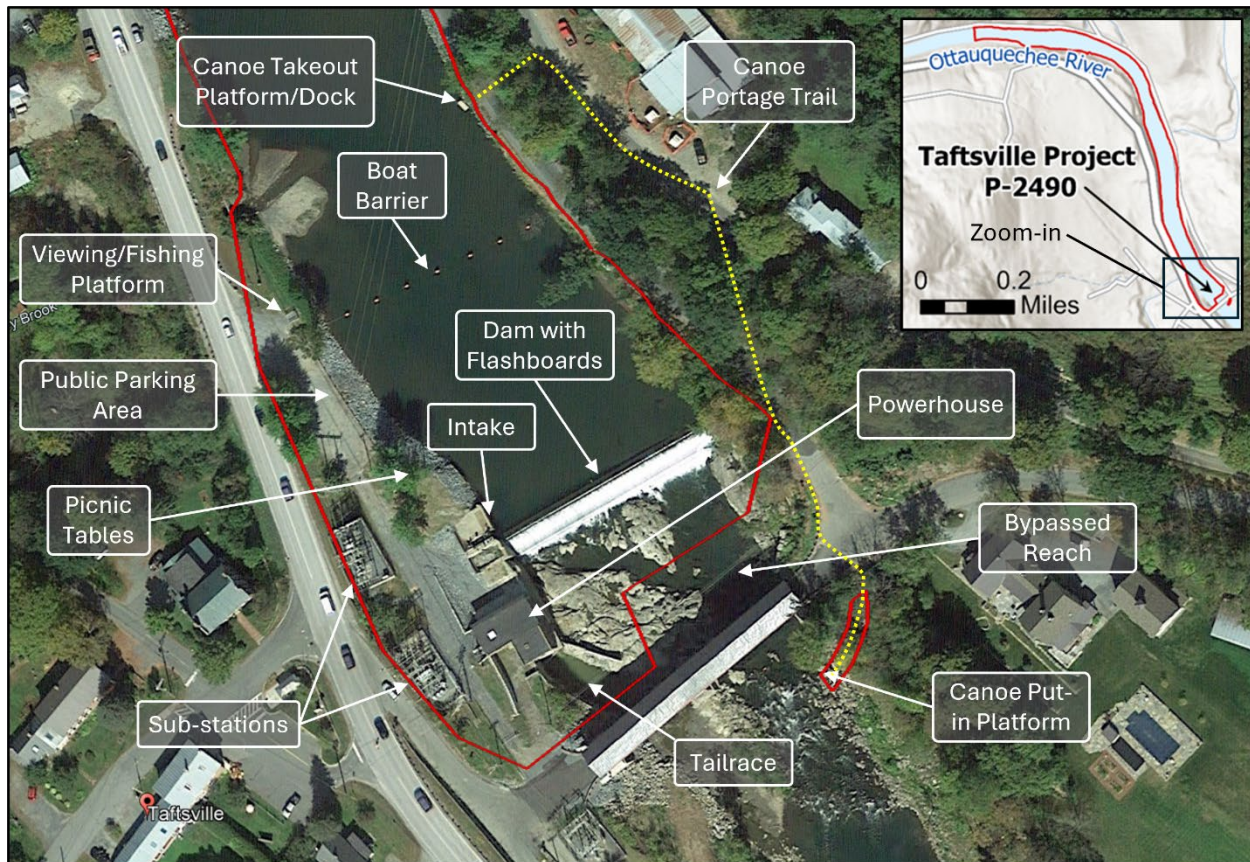


Figure 2. Taftsville Project facilities related to operations and recreation within the project boundary (red line) (Source: Commission Staff).

2.1.2 Project Boundary

The project boundary, as shown in Exhibit G filed March 16, 2023, encloses the project impoundment up to the normal full pool elevation of 638.6 feet. The project boundary also encloses the dam, tailrace area, the transmission line and substations,¹¹ and recreation amenities including the canoe put-in and take-out platforms. The boundary extends about 4,600 feet upstream of the dam, and 200 feet downstream from the dam to the confluence of the bypassed reach and the tailrace.

2.1.3 Project Safety

The Taftsville Project has been operating under the existing license that was issued in 1994. During this time, Commission staff has conducted operational inspections focusing on the

¹¹ The lands under two substations (the Distribution Sub-station and the Transmission West Sub-station) have cultural and historical significance and are currently included within the Taftsville Project boundary. GMP proposes to retain the lands of these two sub-stations within the project boundary and to manage them under an Historic Properties Management Plan (HPMP) for the project.

continued safety of the structures, identification of unauthorized modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance.

As part of the relicensing process, Commission staff evaluate the continued adequacy of the project's facilities under a subsequent license. Special articles are included in any license issued, as appropriate. Commission staff will continue to inspect the project during the term of any subsequent license to ensure continued adherence to Commission-approved plans and specifications, special license articles relating to construction (if any), operation and maintenance, and accepted engineering practices and procedures.

2.1.4 Current Project Operation

Article 401¹² of the current license requires GMP to operate the project in a run-of-river mode, such that outflow from the project approximates inflow. GMP meets this requirement by maintaining a stable impoundment elevation at 638.6 feet. During normal operation, water is released from the impoundment through the powerhouse, or it is passed over the crest of the spillway to a 290-foot-long bypassed section of the Ottawaquechee River. In accordance with Article 402 of the current license, GMP provides a continuous minimum flow to the bypassed reach of 15 cubic feet per second (cfs), or inflow, whichever is less. The minimum flow is uniformly spilled as a veiled flow (about 1 inch) over the dam crest into the bypassed reach of the Ottawaquechee River to enhance the aesthetics and aquatic habitats of the project area.

The project is equipped with 18-inch wooden flashboards which are removed in late fall and replaced in the spring. As required by Article 401, prior to removal, the impoundment is drawn down to 637.12 feet and the project is operated in run-of-river mode at this impoundment elevation until the flashboards are re-installed in the spring. After the re-installation of the flashboards, GMP suspends run-of-river operation and releases 100 cfs, or inflow, downstream from the project continuously until the impoundment is filled back up to a normal full pond elevation of 638.6 feet. Thereafter, GMP resumes run-of-river operation by maintaining a stable impoundment elevation of 638.6 feet.

The project powerhouse contains one turbine/generator unit with a minimum hydraulic capacity of 95 cfs, and maximum hydraulic capacity of 370 cfs. All inflows are passed over the spillway to the bypassed reach until inflows exceed the minimum hydraulic capacity of the project plus the required minimum flow (i.e., 110 cfs). When inflows exceed 385 cfs (the maximum hydraulic capacity plus the 15-cfs minimum flow), the excess water is released over the spillway to the bypassed reach. The project's average annual generation is approximately 1,038 MWh. Generation is often limited during the summer months when river flows are less than the minimum hydraulic capacity of the project.

Article 403 requires the licensee to monitor inflow to the project, and outflow from the project (i.e., downstream from the tailrace and in the bypassed reach).¹³ GMP currently

¹² See 68 FERC ¶ 62,555 (1994).

¹³ See Order Modifying and Approving Flow Management Plans, 72 FERC ¶ 62,051 (1995).

monitors the project operation using a pressure sensor located adjacent to the intake controlled by a Supervisory Control and Data Acquisition (SCADA) system that collects and records impoundment elevation and turbine output in 15-minute intervals. By monitoring this data, GMP is able to adjust generation to maintain stable impoundment elevations and provide the required minimum flow.

2.1.5 Current Environmental Measures

Under the current license, GMP operates the project as described in [section 2.1.4, *Current Project Operation*](#). The current license does not require any additional environmental measures.

2.2 APPLICANT'S PROPOSAL

2.2.1 Proposed Project Facilities

GMP proposes no modifications to the project's facilities.

2.2.2 Proposed Project Boundary

GMP does not propose any changes to the existing project boundary, as described in [section 2.1.2, *Project Boundary*](#).

2.2.3 Proposed Operation and Environmental Measures

GMP proposes to:

- Continue to operate the project in run-of-river mode, where outflow from the project approximates inflow on a continuous basis.
- Continue to release 15 cfs, or inflow, whichever is less, into the bypassed reach via spill over the dam crest to enhance aesthetics and aquatic habitat in the bypassed reach and downstream from the dam.
- Continue to maintain 18-inch wooden flashboards on the spillway, by removing them in the fall and replacing them in the spring.
- When refilling the impoundment and during maintenance activities, release 90% of inflow, and use no more than 10% of inflow to refill the impoundment.
- Consult with the Vermont Department of Environmental Conservation (Vermont DEC) prior to conducting maintenance and repair work that has the potential to adversely affect water quality.
- Consult with Vermont DEC regarding the timing and duration of periodic maintenance drawdowns of the impoundment.
- Restrict the removal of trees greater than or equal to 3 inches in [diameter at breast height](#) (dbh) within the project boundary to the period of November 1 through March 31 to protect the northern-long-eared bat. If tree clearing is required during the

restricted time period (April 1st – October 31st), GMP will consult with FWS and Vermont ANR regarding removal needs.

- Continue to operate and maintain the project recreation facilities that consist of a parking area, picnic area, bank fishing area and viewing platform on the west shore of the impoundment, and a canoe portage on the east side of the impoundment.
- Update the draft Historic Properties Management Plan (HPMP) to address and mitigate project effects on [historic properties](#).

2.2.4 Modifications to the Applicant’s Proposal – Mandatory Conditions

On July 28, 2025, Vermont ANR filed 13 conditions pursuant to section 401 of the Clean Water Act (CWA).¹⁴ The water quality certification (WQC)¹⁵ would require GMP to:

- Operate and maintain the project consistent with the findings, conclusions, and conditions of the certification and do not make any changes to the project or its operations without approval of the Vermont ANR (Condition A);
- Operate the project in run-of-river mode, where outflow from the facility is equal to inflow to the impoundment on a near instantaneous basis (Condition B.1);
- Provide a continuous minimum flow of 45 cfs, or inflow, if less, to the bypassed reach year-round, via spillage over the dam, and spill all inflow at the dam when the project is not operating (Condition B.2);
- Develop a flow management and monitoring plan (Condition C);
- Collect water quality data in the project impoundment and downstream in the tailrace,¹⁶ similar to the study implemented in 2022, during the first full study season after license issuance. If needed, develop a dissolved oxygen (DO) compliance and monitoring plan (Condition D);
- Develop a plan for upstream eel passage within 1 year of upstream eel passage being installed at the Quechee Mills Project (FERC No. 5195) (Condition E);

¹⁴ Conditions A, I, J, K, L, and M are considered general or administrative in nature and are not discussed further in this EA. Conditions E (American Eel Passage) and F (Trashracks) would require measures contingent upon some future action. Both would require an amendment to the existing license, and, thus, subject to an amendment proceeding. At that time the merits of these measures would be addressed. For these reasons, Conditions E and F are not addressed in this EA.

¹⁵ As discussed in [Appendix D, Statutory and Regulatory Requirements](#), Vermont ANR issued a WQC pursuant to section 401(a)(1) of the CWA, 33 U.S.C. § 1341(a)(1).

¹⁶ Although Condition D appears to reference three sampling locations, the 2022 Water Quality Study was limited to two sampling locations: (1) 1.2 miles upstream of the dam in the impoundment, and (2) project tailrace.

- Consult with the Vermont ANR and Vermont Fish and Wildlife Department (Vermont DFW) prior to replacing the trashracks at the project (Condition F);
- Avoid tree trimming and removal of trees of 3-inch dbh or greater between April 1 and October 31 to avoid any roost disruption of the Northern Long-eared Bat, except when necessary to protect public safety or respond to emergency conditions (Condition G);
- Continue to maintain project recreation facilities and provide a canoe take-out with an approximately 4-foot-wide by 10-foot-long floating dock, portage, parking area near the powerhouse, including one spot that is compliant American with Disabilities Act, picnic tables, and additional related items such as interpretative signage, viewing platform and fishing bank area (Condition H);
- Dispose of debris associated with project operation in accordance with the standards and applicable state laws and regulations (Condition I);
- Consult with Vermont ANR before conducting project maintenance or repair work that could affect water quality (e.g., water level or flow management) (Condition J);
- Allow Vermont ANR to inspect the project area at any time to monitor compliance with the certification conditions (Condition K);
- Post a copy of the certification in the project powerhouse (Condition L); and
- Alter or amend the conditions of the certification by Vermont ANR (Condition M).

2.3 STAFF ALTERNATIVE

Under the staff alternative, the project would be operated as proposed by GMP, with the modifications and additional staff-recommended measures described below.

- Develop an operation compliance monitoring plan to document compliance with run-of-river operation and any required minimum flow releases including provisions for monitoring and reporting compliance with run-of-river operation, minimum flows, impoundment water levels, and timing of planned maintenance, as well as reporting deviations from operating requirements to the Commission and Vermont ANR.
- To protect northern long-eared bats and tricolored bats, avoid the removal or trimming of all non-hazardous trees and woody vegetation, regardless of dbh, from April 1 through October 31.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Certain alternatives to GMP's proposal were considered but eliminated from further analysis because they are not reasonable in this case. These alternatives are presented in [Appendix F, Alternatives Considered but Eliminated from Detailed Analysis](#).

3.0 ENVIRONMENTAL ANALYSIS

In this section, we present: (1) a general description of the project vicinity; (2) an explanation of the scope of our cumulative effects analysis; and (3) our analysis of the proposed action and recommended environmental measures. Sections are organized by resource area (aquatics, recreation, etc.). Historic and current conditions are described first under each resource area. The existing condition is the baseline against which the environmental effects of the proposed action and alternatives are compared, including an assessment of the effects of proposed protection, mitigation, and enhancement measures, and any potential cumulative effects of the proposed action and alternatives. Staff conclusions and recommended measures are discussed in [section 5.1, *Comprehensive Development and Recommended Alternative*](#), and [Appendix H, *Comprehensive Development and Recommended Alternative*](#), of this EA.¹⁷

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The Taftsville Project is located at River Mile (RM) 11.3 on the Ottauquechee River, as measured from the confluence with the Connecticut River. The Ottauquechee River is a 38-mile-long tributary of the Connecticut River with a drainage area of approximately 223 square-miles. The Ottauquechee River is located entirely within the state of Vermont. It originates in the town of Killington in Rutland County and is joined by the north branch of the Ottauquechee River in the towns of Bridgewater and Woodstock, then flows eastward where it connects to the North Hartland Flood Control Reservoir and terminates at the Connecticut River near North Hartland, Vermont.

Current uses of the Ottauquechee River include recreation, hydroelectric generation, and wastewater assimilation. There are four hydroelectric projects downstream from the Taftsville Project that include the Downer's Mill Project No. 5195 at RM 7.0 (exemption),¹⁸ the Dewey's Mill Project No. 5313 at RM 5.8 (license), the North Hartland Project No. 2816 at RM 1.5 (license), and the Ottauquechee Woolen Mill Project No. 2787 at RM 0.25 (exemption). Additionally, the Woodstock wastewater treatment facility discharges into the Ottauquechee River about 3 miles upstream of Taftsville Dam, and the Taftsville wastewater treatment facility discharges to the river about 250 feet downstream from Taftsville Dam.

The topography of the Ottauquechee River Basin consists of narrow valleys surrounded by steep slopes. Land in the vicinity of the project is primarily forested, commercial, and residential. The project area has a humid continental type of climate with warm summers and cold and snowy winters. The highest temperatures occur in July and range between 75 Fahrenheit (°F) and 82°F. Winters are cold and snowy, with average low temperatures during January ranging between 2°F and 12°F. Although it rains throughout the year, spring and early

¹⁷ Unless otherwise indicated, the sources of our information are the final license application filed by GMP on August 30, 2022, and the responses to requests for additional information filed on March 17, 2023, August 25, 2023, November 13, 2023, and June 7, 2024.

¹⁸ The dam at the Downer's Mill Project is also known as Emory Mill.

summer tend to receive the most rainfall. The annual precipitation averages around 50 inches, and the typical snowfall ranges between 80 inches to 100 inches.

3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

A cumulative effect is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time, including hydropower and other development activities.

Based on our review of the license application and comments from the agencies, we have identified migratory fish species, including the American eel, as a resource that could be cumulatively affected by the continued operation and maintenance of the Taftsville Project, in combination with other hydroelectric projects, and other past, present, and foreseeable future activities in the Ottauquechee River Basin. We discuss these cumulative effects [section 3.3.2.3, *Cumulative Effects on Aquatic Resources*](#).

3.2.1 Geographic Scope

The geographic scope of the cumulative analysis defines the physical limits or boundaries of the proposed action's effects on the resources and contributing effects from other hydropower and non-hydropower activities within the Ottauquechee River Basin. We have identified the geographic scope for migratory fish (i.e., American eel) as the Ottauquechee and Connecticut Rivers from the upstream extent of the Taftsville Project impoundment on the Ottauquechee River in Windsor, Vermont, to the mouth of the Connecticut River at the Long Island Sound. We chose this geographic scope because migratory fish species that could be affected by the Taftsville Project could use habitat in these two rivers and could be exposed to a number of hydroelectric projects and flow diversions that could have a cumulative effect on the migratory species.

3.2.2 Temporal Scope

The temporal scope of our cumulative effects analysis includes a discussion of past, present, and reasonably foreseeable future actions and their effects on each resource that could be cumulatively affected. Based on the potential term of a subsequent license, the temporal scope looks 30 to 50 years into the future, concentrating on the effects on the resources from reasonably foreseeable future actions. The historical discussion is limited, by necessity, to the amount of available information. The quality and quantity of information, however, diminishes as we analyze resources further away in time from the present. We identified the present resource conditions based on the license application, agency comments, and comprehensive plans.

3.3 PROPOSED ACTION AND ACTION ALTERNATIVES

In this section, we discuss the effects of the proposed action and project alternatives on environmental resources. For each resource, we first describe the affected environment, which is

the existing condition and baseline against which we measure effects. We then discuss and analyze the site-specific environmental effects.

Only the resources that would be affected, or about which comments have been received, are addressed in detail in this EA. Based on this, we have determined that geology and soils, aquatic resources, terrestrial resources, threatened and endangered species, recreation, land use, and aesthetic resources, and cultural resources may be affected by the proposed action and action alternatives. We have not identified any substantive issues related to socioeconomics associated with the proposed action; therefore, this resource is not assessed in this EA. We present our recommendations in [section 5.1, Comprehensive Development and Recommended Alternative](#), and [Appendix H, Comprehensive Development and Recommended Alternative](#).

3.3.1 Geologic and Soil Resources

3.3.1.1 Affected Environment

The Taftsville Project is in southeast Vermont, east of the Green Mountains in the Ottauquechee Valley, which falls within the Vermont Piedmont biophysical region. The Vermont Piedmont is the largest physiographic region in the state and consists of rolling hills and valleys located at the foot of the Green Mountains. The region consists of a number of isolated granite mountains that rise above the surrounding landscape and contains many lakes originally formed by glaciers. The Ottauquechee Valley forms the lowest topographic element of this area and originates from the eastern edge of the Green Mountains. The area is hilly with minor topographic features being controlled by the lithology and structure of the underlying formations. The whole area has been glaciated, with deposits of glacial origin being common (Chang et al, 1965). The Ottauquechee River flows over bedrock of the Devonian Gile Mountain Formation, which primarily consists of non-carbonaceous quartz-mica schist and feldspathic quartzite with interbedded phyllite (Ratcliffe et al., 2011).

Soils

There are four main soil series in the Taftsville Project area (NRCS, 2021). Buckland loam is the most common soil mapped in the project area, representing 20.6%. This soil series consists of moderately well drained, loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite. The Buckland loam series has a soil erodibility factor (K) of 0.32 (NRCS, 2021).¹⁹ The next two most common soils in the project area consist of nearly equal parts of Vershire-Dummerston complex (12.6%), and Dummerston fine sandy loam (12.3%), which consist of well drained loamy till and have erodibility factors of 0.20, and 0.32, respectively (NRCS, 2021). The fourth most common soil is Windsor loamy sand (4.8%), which has an erodibility factor of 0.15 and consists of excessively drained loose sandy

¹⁹ The soil erodibility factor (K) quantifies a soil's susceptibility to erosion by rainfall and runoff. It reflects the influence of soil texture, structure, organic matter, and permeability (Wischmeier and Smith, 1978). K values typically range from 0.02 (low erodibility) to 0.69 (high erodibility), with higher values indicating greater vulnerability to detachment and transport under standard conditions (Renard et al., 1997; Panagos et al., 2014).

glaciofluvial deposits derived from either one or a combination of granite, schist, and/or gneiss (NRCS, 2021).²⁰ Generally, the soils mapped within the project boundary have a moderate to low susceptibility to sheet and till erosion (NRCS, 2021).

Impoundment

The impoundment's western shore along U.S. Route 4 has a narrow, sloped forested buffer with small brush that lines a steep, rocky bank. The eastern shore of the impoundment runs close to Gravel Ledge Road and Old River Road, which is separated by a shallow, gravel- and rock-covered embankment with sparse vegetation that becomes forested as you move northwest from the dam. In the 1994 EA, Commission Staff reported the shoreline substrate to be dominated by gravel and boulders with rock outcrops and little or no silt.²¹ Today, the impoundment is dominated by a mix of silt, gravel, and boulders.

Bypassed Reach

The 290-foot-long bypassed reach is bordered by a rocky shoreline with large bedrock outcrops. It contains a large plunge pool and bedrock falls that extends about 190 feet directly downstream from the dam. The pool transitions into a 100-foot-long, low-gradient riffle before reaching the tailrace confluence.

3.3.1.2 Environmental Effects

Run-of-River Operation

GMP proposes to continue operating the project in run-of-river mode using their SCADA system and weekly operator visits to maintain stable impoundment levels at about 638.6 feet. Under this operation mode, outflow approximates inflow on a continuous basis. GMP also proposes to continue to release 15 cfs, or inflow, whichever is less, into the bypassed reach via spill over the dam crest to enhance aesthetics and aquatic habitat in the bypassed reach and downstream from the dam.

²⁰ In GMP's license application, filed on August 30, 2022, there is a discrepancy with the description of the order of the most common soil types in section 4.2.1.5, *Soils*, compared to the source data (NRCS, 2021) reported in table 4.3, *Mapped Soils Series within the Project Boundary* (NRCS, 2021). In section, 4.2.1.5, GMP states that "*The remainder of the soils in the Project area consist of nearly equal parts Hinckley sandy loam (14B, 14E), Dummerston fine sandy loam (15B, 16E), and Vershire-Dummerston complex (19D, 19E),*" and that "*The Project area also consists of a small section of Windsor loamy sand.*" However, according to the NRCS data reported in table 4.3, Hinkley sandy loam only makes up 1.6% of the project area's mapped soils which is significantly less than Vershire-Dummerston complex (12.6%), Dummerston fine sandy loam (12.3%), and Windsor loamy sand (4.8%). We have corrected the discrepancy in this EA to reflect the data reported in table 4.3 of GMP's license application.

²¹ See FERC's *Notice of Availability of Draft Environmental Assessment* issued on April 1, 1994.

Vermont ANR recommends, and Condition B of the WQC requires, GMP to operate the project in a run-of-river mode, where outflow from the facility is equal to inflow to the impoundment on a near instantaneous basis. Condition B also requires GMP to release a continuous minimum flow of 45 cfs, or inflow if less, to the bypassed reach year-round, via spillage over the dam, as well as spill all inflow at the dam when the project is not operating to improve aquatic habitat in the reach.

Our Analysis

Operation of small run-of-river dams alter natural flow patterns, causing sediment build-up upstream of the dam, and reducing sediment transport downstream. Reduced discharge in the bypassed reaches often leads to sediment accumulation and channel narrowing, while concentrated flows in tailraces increase erosion and incision downstream (Csiki and Rhoades, 2010; Kibler and Tullos, 2013). These shifts can reduce the river's ability to transport sediment effectively, degrading channel form and aquatic habitat (Grant et al., 2003). Continuing to operate the Taftsville Project in a run-of-river mode and releasing a minimum flow of 15 cfs in the bypassed reach, would not adversely affect sedimentation and erosion up- or downstream. Since the current license was issued in 1994, there has been no significant issues related to sedimentation or erosion reported by the applicant or any other entity. Furthermore, the habitat within the project boundary and directly downstream from the project dam is not highly susceptible to erosion and sedimentation.

Increasing bypassed reach flows from 15 cfs to 45 cfs, as recommended by Vermont ANR, and required by Condition B of the WQC, may change sedimentation and erosion patterns upstream of, and downstream from, the project. However, flows at the project often equal or exceed 45 cfs (*see [section 3.3.2, Aquatic Resources](#)*). Moreover, there have been no reported issues with erosion and/or sedimentation occurring at the project. Thus, there is no evidence to suggest that increasing the minimum flow from 15 cfs to 45 cfs would adversely affect the existing geologic and soil conditions at the project.

Maintenance and Repair Drawdowns

GMP proposes to consult with the Vermont DEC on the timing and duration of maintenance or repair drawdowns²² of the impoundment in a manner that minimizes erosion, protects nearshore terrestrial and aquatic habitat, and maintains minimum flows to the bypassed reach. GMP also proposes to update the current impoundment refill regime to match Vermont ANR recommendations. When refilling the impoundment after maintenance activities, including the reinstallation of the project's flashboards, GMP proposes to pass 90% of inflow while using the remaining 10% to refill the impoundment. In addition, GMP proposes to file plans with Vermont DEC for review and approval of maintenance and repair work that has the potential to

²² GMP proposes to continue to install the 18-inch flashboards in the spring when the Ottauquechee River is free of ice and the river flow is less than 400 cfs and remove the flashboards before November 15 (*see 72 FERC ¶ 62,051 (1995)*) by drawing down the impoundment to the dam crest elevation of 637.12 ft.

adversely affect water quality. Vermont ANR recommends, and Condition J of the WQC requires, that GMP files such plans with Vermont DEC.

Our Analysis

Impoundment fluctuations during normal operation have the potential to affect bank stability in the impoundment and in downstream reaches by exposing areas to periodic inundation and dewatering, resulting in erosion of low to moderately susceptible soils. Soil and sediment erosion from streambanks and shorelines of impoundments can adversely affect [riparian](#) and terrestrial habitat and historic properties that may be in the project area, and cause turbidity and siltation in the impoundment and downstream habitat, which can adversely affect water quality and aquatic resources in the affected stream reaches. Operating the project in run-of-river mode by maintaining stable impoundment elevations, as GMP proposes, would not adversely affect geology and soil resources, beyond what is currently occurring. This includes shoreline erosion, turbidity, and siltation in the impoundment and the river downstream from the project.

Drawing down and refilling an impoundment during maintenance can affect bank stability in an impoundment and can also affect resources in ways that are similar to those discussed above for project operation. GMP proposes to continue to limit annual maintenance drawdowns for the installation and removal of the 18-inch flashboards, which go up in the spring and are removed prior to the onset of winter. GMP also proposes to consult with Vermont ANR prior to any maintenance or repair work that could affect water quality. Notifying and receiving feedback from Vermont ANR prior to conducting planned drawdowns for maintenance or repairs would allow the agency to make recommendations to GMP to minimize erosion and sedimentation and adverse effects to water quality and aquatic resources that may result from such maintenance drawdowns. However, Vermont ANR's recommendation and Condition J of the WQC would require that GMP file plans and receive approval from Vermont DEC prior to performing planned maintenance repairs could limit GMP's ability to complete needed repairs in a timely fashion.

3.3.2 Aquatic Resources

3.3.2.1 Affected Environment

Water Quantity and Use

The Ottauquechee River at the Taftsville Project has a drainage area of 192 square miles. Table C-1 shows the average monthly flows at the project from 1992 to 2021.²³ Flows range from a low of 89 cfs in September to a high of 901 cfs in April, with an estimated mean annual daily flow (MADF) of 499 cfs at the project.

²³ Flows were recorded at the USGS gage (No. 01150900), located on the Ottauquechee River near West Bridgewater, Vermont, about 21 river miles upstream of the project dam. Data from July 12, 2010, to September 31, 2011, is missing and omitted from analysis. Flows were prorated by 8.2 to account for the difference between drainage areas at the gage and project dam.

The project's turbine has a maximum hydraulic capacity of 370 cfs. Flows in the Ottauquechee River equal or exceed the maximum hydraulic capacity of the project almost 40% of the time on an annual basis, based on USGS gage number 01150900. The minimum hydraulic capacity of 95 cfs is equaled or exceeded almost 90% of the time on an annual basis, based on gage flows (table C-2).²⁴

Water use in the area includes the Woodstock Wastewater Treatment Facility that is located about 3 river miles upstream of the project. Additionally, there are four permitted facilities that discharge wastewater to the Ottauquechee River downstream from the project, with the closest being the Taftsville-Woodstock Wastewater Treatment Facility, which is located about 250 feet downstream from the project dam and discharges directly into the Taftsville Project's tailrace at RM 10.7 on the Ottauquechee River.²⁵

Water Quality²⁶

Vermont DEC periodically conducts water quality and benthic macroinvertebrate sampling at several sites within the Ottauquechee River. Dissolved oxygen (DO), water temperature, pH, total nitrogen (NO₃-N), total phosphorus, turbidity, and conductivity samples collected at six stations in the river (one downstream from, and five upstream of, the Taftsville Project) between 2002 and 2021 demonstrate that the Ottauquechee River attains the standards for Class B2 waters, except for two locations in 2010 (3 river miles upstream of, and 4.8 river miles downstream from, the Taftsville Project, during low flow, fall months) where DO percent saturation values were below 70% (Vermont ANR, 2023). Also, Vermont DEC evaluates the biological integrity of the macroinvertebrate community by comparing specific metrics to the values expected for a naturally occurring macroinvertebrate population. Macroinvertebrate assessments completed between 2002 and 2019 in the Ottauquechee River found the community to be Good to Excellent,²⁷ and, thus, met Class B(2) water quality standards and fully supported aquatic life (Vermont ANR, 2023).

In 2020, GMP collected DO and water temperature data at 15-minute increments from July 23 through August 26 at the following locations: project impoundment outside of the influence of the project, in the project impoundment upstream of the dam, near the project intake, in the bypassed reach, and in the project tailrace. GMP's water quality study report found that

²⁴ Under GMP's current operation, the Taftsville Project requires a minimum inflow of 110 cfs to operate the project (95 cfs minimum hydraulic capacity of the turbine plus 15 cfs minimum flow to the bypassed reach). Inflow of 110 cfs is exceeded more than 80% of the time, on an annual basis, based on gage flows (table C-2).

²⁵ See the National Pollution Discharge Elimination System permit number VT0100765, issued by Vermont ANR in 2019.

²⁶ Vermont Water Quality Standards, Environmental Protection Rule §29A-306 and §A-03. See table C-3 for a narrative of Vermont's Water Quality Standards at the Taftsville Project.

²⁷ Benthic macroinvertebrate communities are classified on a scale ranging from poor to excellent, which correspond to highly degraded to near natural conditions, respectively.

flow conditions during the study represented typical low-flow, warm-weather conditions when DO concentrations are expected to be the lowest at the project. During the study, the project was not operational, thus all flows passed into the bypassed reach by spilling over the dam.²⁸ The mean flow during the study was 90 cfs, which is less than the mean monthly flow for July and August (table C-1).

The data from GMP's monitoring effort indicated that DO concentrations, on average, met or exceeded the State standard for DO [i.e., 6 milligrams per liter (mg/L) and 70% saturation] at all five monitoring locations the majority of the time. However, there were several days in late July and early August when DO concentrations fell below 6.0 mg/L upstream of, and downstream from, the dam. GMP reported that these low DO periods coincided with the early morning hours and likely are the result of increased respiration by aquatic plants and other primary producers. DO in the bypassed reach met the 6.0-mg/L state standard for the entire study period, including during the three-week period in late July and early August when DO levels were below 6.0 mg/L upstream of, and downstream from, the project.

Water temperatures during the study ranged from 70.3 degrees Fahrenheit (°F) to 81.3°F and averaged between 76.1°F to 77.5°F. Water temperatures remained similar at all monitoring sites during the study period. No [stratification](#) (of temperature or DO) was observed in the project impoundment during the study.²⁹

As requested by Vermont ANR, GMP collected additional water quality data in the impoundment and tailrace to help determine if the water quality meets or exceeds the state standard of 6.0 mg/L and 70% saturation while the project operates during low-flow, high-temperature summer months. GMP collected DO and water temperature in 15-minute increments from July 7 through September 19, 2022. At the time of the sampling, the project was able to operate for 8 hours on August 31. The average river flow at the time of the sampling was approximately 72 cfs. All DO measurements in the tailrace met the 6.0-mg/L standard, and both temperature and DO were relatively uniform throughout the 8 hours of project operation.

Aquatic Habitat and Fishery Resources

The project impoundment is mostly pool habitat and is riverine in nature (i.e., narrow and shallow) with a bottom substrate that is composed of bedrock, boulders, gravel, sand, and silt. The impoundment extends less than 1 mile upstream of the dam to Bourdon Road (Highway 25) and has a surface area of approximately 20.5 acres at the normal maximum water surface elevation of 638.6 feet (with 18-inch-high flashboards). The impoundment is about 195-feet wide near the dam, narrowing to 100-feet at the upstream end of the impoundment, and has a gross volume of 30 acre-feet and a maximum water depth of about 9 feet. The total shoreline

²⁸ Because flows during the study were too low to operate the project, DO monitoring in the tailrace occurred in the discharge pool downstream from the powerhouse where there was no notable flow from August 6 through August 26.

²⁹ In waters designated as coldwater fish habitat and classified as Class B(2) for the fishing designated use, the total increase from ambient temperature due to all discharges and activities shall not exceed 1.0°F. (Vermont Standards, Section 29A-302(1)(B)(iii)).

length within the project boundary is about 1.7 miles. Near shore areas are mostly undeveloped and forested with some exposed gravel bars, shallow littoral zone habitat, and emergent aquatic vegetation.

There are currently no migratory fish in the project area, though this could change during the next license term.³⁰ The resident fish community within the impoundment and Ottauquechee River downstream from the project has not been surveyed recently. However, past surveys in the project area and other reaches of Ottauquechee River documented a mix of [coldwater](#) and [warmwater](#) species, including, brook trout, rainbow trout, brown trout, smallmouth bass, slimy sculpin, and an assemblage of minnows and suckers.

The trout in the project area are primarily the result of stocking, although some natural reproduction is likely to occur in the free-flowing sections upstream of the project impoundment, or in tributaries of the Ottauquechee River both upstream of, and downstream from, the project. The project impoundment supports a small population of wild trout, likely due to temperature limitations and poor habitat quality. Hatchery-reared trout are stocked annually (about 1,600 to 2,500, 10- to 11-inch-long yearling rainbow trout by the Vermont DFW within the Ottauquechee River from Bridgewater Corners to the Taftsville Dam. In 2025, Vermont DFW stocked 2,500 rainbow trout in this 10-mile reach.

The low-gradient bypassed reach extends 290 feet from the base of the dam to the confluence with the powerhouse tailrace (*see* figure 2, and figure B-2). Habitat in the bypassed reach is composed of a 190-foot-long pool with bedrock substrate and a 100-foot-long low-gradient riffle with a rocky shoreline and large bedrock outcrops. Substrate in the bypassed reach includes bedrock and large boulders, with lesser amounts of small boulder, gravel, sand, and silt. The bedrock is higher in elevation on the river left, resulting in most of the water being directed to river right.

Generation and bypassed reach flows combine to form the downstream river reach, which flows about 3.5 miles before reaching the exempted Downer's Mill Project, located at RM 7 (*see* figure 1). This reach is riverine in nature and characterized by a low-gradient slope, which is shallow with exposed gravel bars, cascade, rapid, riffles, runs, and pools. Substrates in the downstream reach are gravel, cobble, boulder, and bedrock.

Freshwater Mussels

Alewife floater, brook floater, and dwarf wedgemussel are the only freshwater mussels known to occur in the Connecticut River watershed. In 2020, GMP conducted freshwater mussel surveys in the project impoundment, bypassed reach, tailrace, and downstream from the confluence of the bypassed reach and the tailrace. No live mussels, shells, or other evidence of mussels were observed.

³⁰ See Vermont DEC's June 5, 2023, filing at 1.

3.3.2.2 Environmental Effects

Mode of Operation

The operation and maintenance of hydropower projects can affect aquatic habitat in impoundments and downstream reaches by exposing nearshore areas to periodic dewatering and altering the frequency and duration of downstream flows. Additionally, operating a dam on a riverine system can affect water quality by increasing the residence time of water in an impoundment and exposing more water at the surface to the heat of the sun. This can increase water temperature and lower the ability of water to retain DO. Collectively these alterations to the flow regime may reduce the suitability of aquatic and nearshore terrestrial habitats for the aquatic and terrestrial species that rely on them.

As described in [section 2.2, *Applicant's Proposal*](#), GMP proposes to continue operating the project in run-of-river mode by maintaining stable water levels in the impoundment at an elevation of 638.6 feet when the 18-inch flashboards are installed in the spring and at 637.1 feet when the flashboards are removed in the fall. GMP also proposes to continue to release a year-round, minimum flow of 15 cfs or inflow, whichever is less, to the bypassed reach. As discussed in [section 3.3.1.2, *Geologic and Soil Resources, Environmental Effects*](#), GMP proposes to continue to conduct two planned drawdowns of the project impoundment each year to install and remove the 18-inch flashboards, by lowering the impoundment by about 4.5 feet. Additionally, GMP proposes to consult with Vermont DEC regarding the timing and duration of maintenance drawdowns, to conduct the drawdowns in a manner that is protective of nearshore terrestrial and aquatic habitat and to maintain minimum flows to the bypassed reach for the protection of aquatic habitat. In addition, GMP proposes to consult with Vermont DEC prior to conducting project maintenance or repair work that has the potential to adversely affect water quality.

Vermont ANR recommends, and Condition B of the WQC requires, that GMP continue to operate the Taftsville Project in a run-of-river mode, specifying that outflow from the project should approximate inflow on a near instantaneous basis, and impoundment levels should not be drawn down for the purpose of generating power. In addition, Vermont ANR recommends, and Condition J of the WQC requires, that GMP file plans with Vermont DEC for review and approval of any project maintenance or repair work, including drawdowns below the normal operating level, if the work may result in a discharge, have a material adverse effect on water quality, or cause less-than-full support of an existing use or beneficial values or use of State waters.

Our Analysis

Operation of hydropower projects in a run-of-river mode, whereby the total outflow from a project approximates the inflow to the impoundment, generally provides a more stable upstream and downstream environment than other modes of operation (i.e., peaking operation and storage projects). Compared to peaking projects and storage projects, run-of-river operation minimizes the degree of water level fluctuations and associated erosion and temperature fluctuations in impoundment surface waters (due to shorter residence times) and results in a downstream flow regime that is more similar in magnitude and timing to natural river flows.

Because there would be no changes in project operation other than an increase in minimum flows, there would be no change in the volume, schedule, or duration of flow released to the Ottauquechee River downstream from the project, and no change in the aquatic habitat in the impoundment. Additionally, continuing to operate the project in a run-of-river mode, would continue to minimize the length of time water is retained in the impoundment and would help avoid increasing water temperatures in the upper levels of the impoundment from solar heating, which would continue to benefit water quality, fish, and benthic macroinvertebrates in the Ottauquechee River. The impoundment level would not be subject to artificial fluctuations and would continue to be stable for aquatic organisms, including fish and macroinvertebrates.

GMP conducts two planned annual drawdowns of the project impoundment to install and remove the 18-inch flashboards. During these planned drawdowns, GMP lowers the impoundment surface elevation about 4.5 feet. Though uncommon, additional unplanned maintenance and/or emergency drawdowns may occur throughout the year. Drawdowns of the impoundment have the potential to adversely affect aquatic resources by reducing species abundance, and affect the species composition, of the macroinvertebrate community occupying the littoral zone. Seasonal impoundment drawdowns can also prevent the establishment of submerged aquatic vegetation. If water surface elevations decrease rapidly, drawdowns can lead to stranding and isolating fish or benthic invertebrates in nearshore and off-channel habitats. GMP proposes to consult with Vermont DEC regarding the timing and duration of maintenance drawdowns and to maintain minimum flow requirements to the bypassed reach during drawdowns to minimize the effects of flow and water surface elevation fluctuations on terrestrial and aquatic resources. Given that GMP's planned drawdowns are short in duration and magnitude and that GMP proposes to consult with Vermont DEC before initiating a drawdown of the impoundment, the effects of maintenance drawdowns on aquatic resources are likely to be minimal.

Notifying and receiving feedback from Vermont DEC prior to conducting a planned drawdown as proposed by GMP and required by WQC Condition J would allow the agency to make recommendations to GMP to minimize adverse effects to water quality that may result from maintenance drawdowns. However, GMP's proposal and the WQC's requirement to file plans and receive approval from Vermont DEC prior to performing maintenance repairs could limit GMP's ability to complete needed repairs in a timely fashion.

Bypassed Reach Minimum Flows

Under to the current license, GMP is required to discharge a minimum flow of 15 cfs, or inflow to the impoundment, whichever is less, from the dam to the bypassed reach to protect aquatic resources in the Ottauquechee River.³¹ GMP proposes to continue to release 15 cfs as spill over the dam's spillway.

Vermont ANR recommends that GMP release a year-round minimum flow of 45 cfs, or inflow, whichever is less, to the bypassed reach with at least 15 cfs spilling over the dam crest. Vermont ANR states that Vermont DEC prefers to maintain 80% of the maximum habitat observed for the most limiting species and life stages. Therefore, Vermont ANR does not

³¹ See 68 FERC ¶ 62,555 (1994) at Article 403.

believe that a 15-cfs flow provides high-quality aquatic habitat to the reach. Instead, Vermont ANR states that a range of flows from 40 cfs to 84 cfs would provide 80% of the maximum observed habitat for the most limiting species. Condition B of the WQC requires a release of 45 cfs, with the entire flow released as spillage over the dam, unless otherwise described in the flow management and monitoring plan or approved by Vermont ANR. In addition, when the project is not operating, Condition B requires that all flow be spilled at the dam.

Our Analysis

Flow/Habitat Relationship

In 2022, GMP (2023b, 2023c) conducted an additional water quality study at the Taftsville Project at Vermont ANR's request to help determine the conservation flow necessary to meet Vermont's water quality standards. A part of that study, GMP conducted an Instream Habitat Flow Study in the bypassed reach to evaluate the project effects and habitat suitability for aquatic species typical of Vermont river systems at different flows within the bypassed reach (15, 32, 49, 60, 75, and 96 cfs) (table C-3).³² One representative transect was selected within the bypassed reach where water depth, water velocity, and stream width were measured, substrates were classified, and photographs were taken. Field data were then compared to habitat suitability curves that described water depth, water velocity, and substrate preferences of the target species/life-stages (figure B-2).³³

According to the study results, for most species/life-stages (excluding adult fallfish, juvenile and adult brown trout, and adult longnose dace), the largest increase in habitat suitability occurred between 15 cfs and 32 cfs as the river channel became wetter, deeper, and faster flowing. Habitat suitability continued to increase for species/life-stages as flow increased from the current and proposed minimum flow of 15 cfs to the maximum test flow of 96 cfs, except for adult blacknose dace, adult and juvenile longnose dace, and juvenile fallfish. However, the increase in suitable habitat between 60 cfs and 96 cfs was less than 10% for all species/life-stages (table C-3).³⁴ As more water is released from the dam, water depth and velocity increased but the extent of the river channel's wetted width generally remained unchanged because the channel is generally confined in the bedrock and large boulder substrates, except for during the release of 96 cfs when a small section of stream on the river left became inundated.

GMP's proposed 15-cfs minimum flow provides greater than 80% of the maximum available habitat for adult blacknose dace; greater than 70% of the maximum available habitat for the juvenile life stages for fallfish (71%), brown trout (69%), and longnose dace (77%); and 17% for benthic macroinvertebrates. In comparison, Vermont ANR's recommended, and the WQC's required minimum flow of 45 cfs would provide 90% or greater of the maximum available habitat for juvenile brown trout, fallfish and longnose dace, and adult longnose dace;

³² In their May 27, 2022, letter, Vermont ANR requested that GMP include the aquatic base flow of 0.5 cubic feet per second per square mile (csm) as a test flow. The Taftsville Project has a drainage area of 192 square miles, the 0.5 csm test flow is 96 cfs.

³⁴ The largest increase in habitat suitability for benthic macroinvertebrates occurred at 32 cfs (29%) with the second highest at 49 cfs (25%) (table C-3).

75% of the maximum observed available habitat for adult blacknose dace and fallfish as well as juvenile and adult white sucker; and 65% of the available habitat for benthic macroinvertebrates. Vermont ANR's recommended the WQC's required minimum flow of 45 cfs would improve aquatic habitat for most species/life-stages but would result in a modest loss of habitat for adult blacknose dace and juvenile longnose dace. Thus, Vermont ANR's recommended and the WQC's required minimum flow of 45 cfs would improve aquatic habitat compared to the proposed minimum flow of 15 cfs.

The bypassed reach is dominated by bedrock and boulders, which limits fish habitat in the reach. For example, the 90-foot-long pool directly downstream from the dam is not hydraulically connected to the tailrace and is almost entirely composed of bedrock. The 100-foot-long, low gradient riffle section of the bypassed reach is composed of large boulders and cobble. While the bypassed reach's physical attributes provide a means to maintain water quality in the reach (i.e., DO concentrations above 6.0 mg/L and saturation levels at or above 70%) during the high-temperature, low-flow summer months, as discussed in [section 3.3.2.1, *Aquatic Resources, Affected Environment*](#), the bypassed reach supports limited fish populations and there is no documented spawning activity. Moreover, during July, August, and September in average water years, flows are often not sufficient for the project to operate; consequently, all flows are spilled. Thus, when there is the maximum potential for an adverse effect during the low-flow, high-temperature months, the project would be spilling all inflow to the bypassed reach.

Water Availability for Bypassed Reach Flows

Table C-4 displays the median monthly inflow at the project and the anticipated spill flow expected to enter the bypassed reach under existing and proposed conditions, and Vermont ANR's recommended, and the WQC's required 45-cfs year-round minimum flow. The project's minimum hydraulic capacity is 95 cfs and its maximum capacity is 370 cfs. Under current operations with a 15-cfs year-round minimum flow, the aquatic habitat in the bypassed reach remains wetted and interconnected with the existing minimum flow of 15 cfs. Inflow is typically too low to operate the project during the entire months of August and September, when the majority of inflow is spilled to the bypassed reach.

To meet Vermont ANR's recommended, and the WQC's required minimum flow, GMP would need to curtail generation parts, if not all, months except April, when flows frequently exceed the maximum generating capacity of the project. Similarly, median flows for August and September are typically below the minimum hydraulic capacity of 95 cfs; therefore, flows spilled to the bypassed reach would be similar during these months with either a 15-cfs or 45-cfs flow release.

Compared to existing conditions, Vermont ANR's recommended, and the WQC's required 45-cfs flow would result in an additional 30 cfs being spilled continuously, when available, into the bypassed reach year-round (*see* table C-4). Under existing conditions, there is insufficient inflow for the powerhouse to operate 53% to 63% of the time during the months of August and September and 11% to 36% of the time during June, July, and October (table C-5). Under Vermont ANR's recommended, and the WQC's required flow of 45 cfs, there would be insufficient inflow for the powerhouse to operate 65% to 74% of the time during the months of

August and September, 20% to 47% of the time during the months of June, July, and October, and 10% and 8% of the time during the months of March and November (table C-5).

Currently, the project meets its minimum flow requirement by spilling a flow of 15 cfs (about 1.0 inch of veiled flow) over the dam. This strategy may not be practical for meeting a new minimum flow of 45 cfs, which results in a 100% increase in flow spilled over the dam could result in operating the Taftsville Project up to 40% less when compared to the current minimum flow of 15 cfs (*see* table C-5). Therefore, another strategy may be needed with any new continuous year-round minimum flow requirement that exceeds the current and proposed 15 cfs over the spillway. Developing a flow management plan, as recommended by Vermont ANR, and required by the WQC, would help identify the strategies GMP could use to release an increased minimum flow to the bypassed reach, including the installation of a small turbine unit, additional flow release through the spillway, weirs, bottom outlets, or siphons that bypass the turbines (International Hydropower Association, 2020).

Water Quality

During the 2020 water quality study, DO concentrations at the intake and in the tailrace stayed above the state standards of 6.0 mg/L and 70% saturation 90.9 and 95.0% of the time, respectively. Similarly DO concentrations upstream of the impoundment, within the impoundment, and in the bypassed reach exceeded the state standards 99.2%, 74%, and 100% of the time, respectively, during the study. Water temperatures during the water quality study were generally consistent throughout the project area, followed similar daily trends, and were within the state standards, except on a few occasions in the bypassed reach and tailrace (e.g., there were increases in water temperature between the upstream sampling location and the downstream sampling location that exceeded the state standard of 1.0°F) (table C-3). When water temperatures in the bypassed reach and tailrace exceeded the state standard, the difference between upstream and downstream water temperatures was typically less than 2.0°F. The small size and shallow depth of the Taftsville Project impoundment creates a short hydraulic water residence time of about 0.9 hours.³⁵ This short residence time and the small amount of warming appears to suggest that water in the impoundment is replaced quickly, limiting the length of time water is warmed by the sun. While a short residence time makes it unlikely that water temperature or DO in the impoundment will seasonally stratify, the slowing of water in the impoundment likely contributes to the small differences observed in upstream versus downstream water temperatures.

GMP proposes to continue to release a continuous minimum flow of 15 cfs or inflow, whichever is less, to the bypassed reach. Vermont ANR recommends, and the WQC requires, a continuous minimum flow if 45 cfs, or inflow, whichever is less, with the flow spilled over the spillway. Because the water quality study was conducted during the high-temperature, low-flow months, while the turbine was inoperable, all flows were passed downstream to the bypassed reach over the spillway. This scenario likely resulted in the typical amount of spill that normally

³⁵ The hydraulic residence time measures the average length of time the impoundment stores water, which can be many years for larger reservoirs. At the Taftsville Project, the residence time is 0.9 hour, which is calculated by dividing the 30 acre-feet storage capacity of the impoundment by the 400-cfs mean annual flow.

occurs into the bypassed reach during this time period (*see* table C-5). For this reason, water temperature and DO concentrations in the bypassed reach would generally be expected to meet or exceed state standards during periods of low inflow.³⁶ As a result, we expect that continuing to operate the project in a run-of-river mode, with either a 15-cfs or 45-cfs minimum flow released to the bypassed reach would have no effect on water quality in the bypassed reach.

WQC-Required Water Quality Study

Condition D of the WQC requires that GMP collect water quality data in the project impoundment and in the tailrace during the first full study season after license issuance. Condition D also requires that the water quality monitoring be consistent with the 2022 study plan.

Our Analysis

DO is an important indicator of water quality and is an indicator of a water body's ability to support aquatic life. Various factors influence DO concentrations, including water temperature, air temperature, and atmospheric pressure. DO concentrations fluctuate daily and seasonally, with changes in water temperature and atmospheric pressure. Low DO levels (i.e., below 6.0 mg/L) are exacerbated in stagnant water because of a lack of mixing flows, which reduces gas exchange and diffusion rates. The compounding effect of warmer water and stagnation can be harmful to fish and other aquatic organisms due to insufficient DO availability. Prolonged exposure to low DO levels, even if not directly lethal, can significantly increase the susceptibility of aquatic organisms to other environmental stressors and diseases.

2020 Water Quality Study

GMP's 2020 water quality study, conducted from July 23 through August 26, 2020, and discussed in [section 3.3.2.1, *Aquatic Resources, Water Quality*](#), identified low DO levels (below 6 mg/L) in the impoundment, at the intake, and in the tailrace during the season's low flow and high temperature periods.

During the study, DO concentrations in the impoundment fell below 6.0 mg/L in 26% of the measurements (836 events). These low-DO events, monitored continuously over the entire study duration, lasted an average of 8.22 hours, ranging from 15 minutes to 13.75 hours. Average DO during these events was 5.1 mg/L, with lows reaching 2.6 mg/L. Inflow during the low-DO events ranged from 39 to 116 cfs, with the average inflow less than 55 cfs during 67% of these events.

The results from the 2020 water quality study indicated that low summer DO concentrations in the shallow impoundment coincided with low inflows. Despite a short residence time of about 0.9 hour, the data suggests that natural biochemical processes are at least partially responsible for these low DO conditions. Specifically, solar heating during summer low-flow periods, which contribute to reduced DO concentrations. Furthermore, reduced oxygen

³⁶ During the 2020 water quality study, prorated inflow to the project dropped as low as 28 cfs and averaged 90 cfs during the study.

solubility in warmer water and the shallow nature of the impoundment enhances biological activity (e.g., organic matter decomposition, which consumes DO). These natural biochemical processes are likely contributing to low DO levels in the impoundment, even under the current run-of-river operating regime.

In the tailrace, there were 77 events with DO concentrations less than 6.0 mg/L. However, DO sampling in the tailrace was limited to August 6 through August 26, because the turbine was inoperable due to low river flows causing the tailwater channel to be dewatered.³⁷ The low DO events lasted from 15 minutes to 11.8 hours, with an average duration of 3.9 hours. The average DO concentration during these events was 5.6 mg/L, but DO concentrations were as low as 4.0 mg/L. The highest water temperature in the tailrace associated with low DO measurements was 65°F.

The 2020 water quality study offered valuable insights into baseline DO conditions at the Taftsville Project. However, Vermont ANR concluded that the scope of the findings were limited by the project's inability to operate during periods of low flow. Vermont ANR's February 23, 2022, letter highlighted the importance of obtaining DO data during operational, low-flow,³⁸ summer conditions to facilitate a comprehensive assessment. Consequently, in its 2022 letter, Vermont ANR recommended that GMP collect additional DO data during the 2022 low flow, summer period when the project is operational.

2022 Water Quality Study

As part of the 2022 Instream Flow Aquatic Habitat Study, discussed above, GMP (2023b, 2023c) collected DO, temperature, and project generation data from July 7 through September 19, 2022. Continuous DO loggers were installed in the impoundment, about 1.2 miles upstream of Taftsville Dam, and in the project tailrace. The Taftsville Project operated for 8 hours during this 10.5-week study. Inflow during the study ranged from 18 cfs to 2,002 cfs, with a median inflow of 55 cfs.

In the impoundment, DO concentrations ranged from 0 to 15.2 mg/L, averaging 8.3 mg/L, and saturation levels ranged from 0 to 170.9%, with an average of 96.9%. During the same period, water temperature in the impoundment ranged from 57 to 87°F, averaging 73°F. In the tailrace, DO concentrations ranged from 6.2 to 12.2 mg/L, averaging 6.8 mg/L, and saturation levels ranged from 74.9 to 134.4%, with an average of 102%. During the same period, water temperature in the tailrace ranged from 60 to 85°F, averaging 72°F.

The WQC-required minimum bypass flow of 45 cfs (Condition B) would likely exacerbate periods of low DO in the tailrace during the low-flow, summer months. The project

³⁷ On August 6, 2020, GMP initiated tailwater monitoring in a small, isolated pool with no notable flow immediately downstream from the powerhouse.

³⁸ Ottawaquechee River's summer [7Q10](#) flow is 26.6 cfs (Vermont ANR, 2024), and low flow is defined by Vermont ANR as 3 times the 7Q10 flow (or 79.8 cfs). Inflow was at or below 79.8 cfs for 77% of the time during the 2020 study and for 74% of the time during the 2022 study.

currently operates with inflows of at least 110 cfs (95 cfs minimum turbine flow and 15 cfs minimum flow). During July and August, the project is already shut down 36 and 53% of the time, respectively. The increased minimum flow requirement would necessitate minimum inflows of 140 cfs for project operation, resulting in additional shutdowns of 11% (47% total) in July and 12% (67% total) in August (*see* table C-6). Despite low-flow years like 2020 and 2022, increasing the bypassed reach flow from 15 cfs to 45 cfs would not improve water quality in the tailrace, because the tailrace does not receive flows from the bypassed reach and would remain dry during periods when inflows are too low to operate the project.

Conducting an additional water quality study during the first full study season after license issuance, as required by Condition D of the WQC, would likely result in a decrease in project operation during the study. Given the comprehensive water quality studies conducted in 2020 and 2022, there is a high probability that a new study would confirm previously observed conditions, with little likelihood of uncovering substantially new information.

Enhancing DO Concentrations in the Impoundment and Tailrace

Certification Condition D of the WQC requires that, if the water quality results from the required post-license study do not comply with Vermont's DO standards (i.e., 6 mg/L and 70% saturation), GMP must develop a compliance plan. This plan, as outlined in Condition D, may incorporate various corrective actions, including modifications to project operation, injecting oxygen into the turbine draft tube, aerating the outflow, or some combination of compliance measures. In addition, Condition D requires GMP to monitor and report annually until compliance is achieved in the impoundment and the tailrace.

Our Analysis

Condition D of the WQC requires DO enhancement measures (i.e., changes in project operation, aerating turbine draft tubes, aerating outflow, or some combination of methods). Such measures have been used at other hydropower projects to increase DO concentrations in project impoundments and in a river downstream. Nonetheless, DO concentrations can exhibit substantial temporal and spatial variability, being influenced by factors including flow volume, ambient temperature, atmospheric pressure, the content of dissolved solids in the water, and site-specific chemical, physical, and biological processes. The 2020 study resulted in average low-DO concentrations of 5.1 mg/L in the impoundment and 5.6 mg/L in the tailrace, with minimums of 2.6 mg/L and 4.0 mg/L, respectively. To attain and sustain 6.0 mg/L DO standard at the project, GMP may be required to employ a range of mitigation strategies. However, without a comprehensive, project-specific plan outlining these enhancement measures, staff is unable to quantify the benefits associated with the WQC's requirement for improving DO concentrations in the impoundment and tailrace.

Operation Compliance Monitoring

Although compliance measures do not directly affect environmental resources, they do allow the Commission to verify that a licensee is complying with the environmental requirements of a license. Therefore, operational compliance monitoring and reporting are typical requirements in Commission-issued licenses.

GMP does not propose any formal measures for monitoring and reporting compliance with its proposed operating mode (i.e., run-of-river operation, maintaining impoundment levels, continuous minimum flows of 15 cfs, or inflow, whichever is less). However, GMP states that it monitors project operation through regular onsite operational checks³⁹ and using a SCADA system that collects and records the impoundment elevation and turbine output in 15-minute intervals. The system consists of a pond level sensor installed in the stilling well located adjacent to the powerhouse intake that continuously monitors impoundment levels and automatically adjusts powerhouse flows to maintain impoundment levels at the desired elevation.⁴⁰ GMP maintains run-of-river operation with a normal full pond elevation of 638.6 feet by operating the turbine using an automatic pond level control. By monitoring SCADA data, conducting regular operation checks, and using automatic pond level control of the turbine, GMP is able to adjust generation to maintain stable impoundment elevations and provide required minimum flows of 15 cfs through spillage over the crest of the spillway, but it does not indicate that it can currently transmit the data to the internet. GMP would continue to use the automated system to maintain compliance with its proposed run-of-river and minimum flow operating requirements.

GMP proposes to consult with the Vermont DEC on the timing and duration of maintenance or repair drawdowns of the impoundment. Vermont ANR recommends that GMP consult with Vermont DEC prior to conducting maintenance or repair work that could cause a deviation from operational requirements affecting water quality. Vermont ANR also recommends that its recommended flow management plan include methods for continuously monitoring flow releases, impoundment levels, and inflows; and provisions for flow data to be available on a “near real-time basis,” if requested.

Lastly, Vermont ANR recommends, and Condition C of the WQC requires, that GMP develop a flow management plan to document compliance with run-of-river operation and flow releases. The components of the flow management and monitoring plan would include: (1) a method for continuous monitoring⁴¹ and reporting of flow releases at the project (including spill flows, turbine discharge, impoundment levels, and inflows); (2) provisions for the flow data “to be available on a near real-time basis,” upon request; and (3) procedures for reporting deviations from operating requirements to Vermont DEC within 15 days of the deviation indicating the cause, severity, and duration of the deviation, observed or reported adverse environmental impacts from the incident, pertinent data, and measures to be taken to avoid recurrences.

Our Analysis

GMP’s existing automated impoundment level monitoring and control system has proven sufficient to monitor compliance with its proposed run-of-river operation and minimum flow

³⁹ GMP reports that operational checks usually occur every weekday but can increase in frequency during high flows and decrease in frequency during low flows.

⁴⁰ 72 FERC ¶ 62,051 (1995).

⁴¹ Condition C requires a “flow management and monitoring plan.” Staff refer to the plan as a project operation compliance monitoring plan.

requirements. The pond level sensor, coupled with logging generation outflow, would adequately demonstrate compliance with maintaining defined impoundment levels and any required spill flows in 15-minute intervals, which would be indicative of run-of-river operation.

Vermont ANR's recommendation to monitor inflows, outflows, and minimum flow that is spilled over the dam and make the data "available on a near real-time basis" could also be used to monitor compliance with run-of-river operation and spill flow releases. However, we are not aware of any existing stream gages in or near the project's impoundment, in the bypassed reach, or immediately downstream from the powerhouse that could be used for continuous real-time monitoring and reporting. To monitor and report inflow, outflow, and spill on a "near real-time basis" would require GMP to install and operate at least two stream gages that are capable of continuously monitoring stream flows and transmitting the data in real-time.⁴² However, because GMP's existing impoundment level monitoring and control system has proven sufficient to monitor compliance with project operating requirements, we question the need for GMP to install and operate new stream gages to monitor inflows and bypassed reach flows at the project in real time.

Condition C of the WQC does not include the frequency of monitoring that would be needed to satisfy the continuous monitoring requirement. However, monitoring and reporting at 15-minute intervals would achieve the requirement of continuous monitoring.

Regarding reporting deviations from operating requirements, GMP does not formally propose to maintain a log of project operation, nor does it propose to report any deviations from its proposed operating requirements to the Commission. While reporting deviations to Vermont ANR, as required by Condition C of the WQC, would assist GMP and Vermont DEC in tracking compliance with operating requirements, such deviation(s) should also be reported to the Commission so that it can determine compliance with the operating requirements of the license. Developing a project operations compliance monitoring plan that includes GMP's proposed operation monitoring procedures, including maintaining a log of project operation and reporting deviations to the Commission and Vermont ANR and Vermont DEC would enable the Commission to better administer and track compliance with the operating requirements of the license.

Impingement, Entrainment, and Turbine Mortality

Water intake structures at hydropower projects can injure or kill fish that come into contact with intake screens, trash racks, or turbines. Fish that have body widths greater than the clear spacing between the trash rack bars, and/or have [burst swim speeds](#) lower than [approach velocities](#) or [through-screen velocities](#), can become trapped against intake screens or bars of a trash rack. This process is known as impingement and can cause physical stress, suffocation, and death to some fish (EPRI, 2003). Entrainment into the intake structure occurs if fish are small enough to pass between trash rack bars, and are unable to overcome the approach velocity, or if they choose to pass downstream through the trash rack. If entrainment occurs, fish injury or

⁴² Although there is no stream gage that is capable of monitoring outflows from the powerhouse, GMP's existing automated monitoring system is capable of continuously monitoring powerhouse outflows and recording them at 15-minute intervals.

mortality can result from collisions with turbine blades, exposure to pressure changes, shear forces in turbulent flows, or water velocity accelerations created by turbines (Rochester et al., 1984). Fish that are entrained and killed are removed from the river population and no longer available for recruitment to the fishery.

GMP proposes to continue operating with full-depth (15-foot-tall by 13-foot-wide) trash racks with 3-inch clear bar spacing. A maximum approach velocity of 2.6 feet per second (fps)⁴³ occurs when operating the project at its maximum hydraulic capacity of 370 cfs. Debris, which can affect the rate of impingement, is manually removed from the trash racks. GMP proposes no other measures to reduce fish mortality as a result of impingement or entrainment, and no entity provided recommendations for fish impingement, fish entrainment, or turbine mortality.

Our Analysis

To estimate the risk of impingement and entrainment, we identified five representative fish species that likely reside within the project impoundment (e.g., brown trout, rainbow trout, smallmouth bass, longnose dace, and white sucker) based on surveys conducted upstream of the project (see [section 3.3.2.1, Affected Environment, Fishery Resources](#)). We compared the burst swim speeds for these species to the 2.6 fps approach velocity in front of the trash rack. As indicated in table C-8, all adults and most juveniles for all five species have burst swim speeds that exceed the approach velocity at the intake. Thus, the adult life stages of the five and the juvenile life stages of 3 representative species that occur upstream of the project are capable of swimming to avoid impingement and entrainment.

Our analysis indicates that the adult life stages of the five representative species upstream of the project are not likely to be entrained, and, thus, would not be affected by turbine mortality. Nonetheless, some entrainment and turbine mortality are likely to occur at the project, as some fish are likely to volitionally swim downstream through the project's trash racks. However, entrainment studies have shown that the majority of fish entrained are small, and many are young-of-the-year (EPRI, 1997). The younger individuals in a fish population generally have high rates of natural mortality, even in the absence of hydropower operations. Fish populations typically withstand losses of large numbers of these smaller and younger individuals with little impact to the overall population. Further, any turbine mortality may be offset by increased survival and growth of the remaining fish within the project impoundment due to reduced competition for limited resources (Ricker, 1975; EPRI, 1992; Therrien and Bourgeois, 2000). Thus, entrainment and turbine mortality of smaller and younger individuals could occur but would likely have minimal consequences to the fish communities in the project impoundment and Ottawaquechee River.

3.3.2.3 Cumulative Effects on Aquatic Resources

In late 1700s, the Ottawaquechee River was used as a transportation route for timber and hydroelectric power generation for mills (i.e., sawmills, grist mills) (FERC, 1994). Today, there

⁴³ Maximum estimated approach velocity was calculated using the formula: approach velocity = (intake flow)/(intake cross section area) (EPRI, 2000).

are five dams in the Ottawaquechee River, as discussed in [section 3.1, General Description of the River Basin](#), and shown in figure 1. The construction of these dams may have converted a riverine system into a series of impoundments, resulting in decreased velocity and increased water depth, and likely led to some increase in water temperature and lowering of DO concentrations. Installing hydropower turbines also likely resulted in fish mortality and the dam structures impeded the migrations of diadromous species (e.g., American eel, Atlantic salmon). In addition to dams and logging, urban development, agriculture, and the historical lack of wastewater treatment (Jennison, 1985) has likely affected water quality in the Ottawaquechee River. Today, the Taftsville Project, in combination with the other hydropower and non-hydropower dams in the Ottawaquechee River Basin, as well as point and non-point sources of water pollution cumulatively affect water quantity, water quality, aquatic habitat, and fish mortality. Additionally, maintenance and repair activities at the project could result in occasional, temporary flow disruptions, which could cumulatively affect aquatic organisms downstream from the project.

American eels

The Ottawaquechee River Basin is part of the Connecticut River Basin and is within the native range of the American eel. After entering the Connecticut River from the Atlantic Ocean, eels must pass four hydropower dams on the Connecticut River⁴⁴ and four on the Ottawaquechee River before reaching the Taftsville Project. Of the Connecticut River dams, only the Holyoke Project No. 2004 has upstream eel passage facilities. However, some eels pass upstream in the Connecticut River through upstream fish passage facilities designed for anadromous species (e.g., American shad, river herring, and Atlantic Salmon) at the Turners Falls, Vernon, and Bellows Falls Projects (FirstLight, 2016; TransCanada, 2016).⁴⁵

There are eight dams between the Taftsville Project and the mouth of the Connecticut River at Long Island Sound⁴⁶ that have the potential to adversely affect fish migration. The upstream migration of fish in the Connecticut River, including American eel, was first disrupted by the construction of the dam at Turners Falls, Massachusetts in the 1800's. The construction of the dam at Holyoke, Massachusetts in 1849 essentially eliminated anadromous fish runs

⁴⁴ The four dams are at the Holyoke Project No. 2004 (RM 87), the Turners Falls Project No. 1889 (RM 122), the Vernon Project No. 1904 (RM 142), and the Bellows Falls Project (RM 174).

⁴⁵ The former falls at the Bellows Falls Project, which is about 36 miles downstream from the mouth of the Ottawaquechee River (and the Taftsville Project is an additional 10.8 miles upstream from the Ottawaquechee River's confluence with the Connecticut River), was the historical upstream limit for migratory species in the Connecticut River Basin, except for American eel, which migrated upstream to the Connecticut Lakes. Located near the U.S. – Canada border, Connecticut Lakes is the source of the Connecticut River.

⁴⁶ Four of the dams are on the Connecticut River, including dams for the Holyoke Project No. 2004 at RM 87, the Turners Falls Project No. 1889 at RM 122, the Vernon Project No. 1904 at RM 142, and the Bellows Falls Project at RM 174. The mouth of the Ottawaquechee River is located at RM 210. The additional 4 dams on the Ottawaquechee River are depicted in figure 1.

between Holyoke and Turners Falls, until 1955 when the first effective fish lift was installed at the Holyoke Project (Leggett et al., 2004).⁴⁷ The installation of an upstream fishway at the Turner Falls Project in 1980 provided access to an additional 20 miles of mainstem habitat for upstream migrating fish. Upstream fish passage facilities were completed at the Vernon Project in 1981 and at the Bellows Falls Project in 1984. These fish passage facilities allowed American eel, to extend their range further upstream, as eels were found upstream of the Vernon Project dam and the Wilder Project dam in the 1980s and 1990s (TransCanada, 2016). The dams on the mainstem Ottawaquechee River do not have fish passage facilities, including for American eel. Ottawaquechee Woolen Mill Dam, the first dam on the Ottawaquechee River, is 7 feet tall, which some eels could climb and reach the North Hartland Project tailrace. Because the height of the Corps' North Hartland Dam is 185 feet tall, it likely prevents eels from migrating farther upstream (FERC, 2022). However, eels are expected to pass North Hartland Dam in the future, as the license issued for the North Hartland Project in 2023 requires an eel trapping program at the project within 1 year of the installation of eel passage at the Bellows Falls Project.⁴⁸ On May 15, 2025, the Commission issued a draft Environmental Impact Statement for the Bellows Falls Project that includes a recommendation, as part of the staff alternative (based on a section 18 fishway prescription and water quality certification condition), for the applicant to monitor the existing upstream eel ladder at the project for eel usage, study the hydraulic and eel passage performance, and design and construct modifications to the existing fish ladder, if necessary.

Upstream eel passage is currently pending at the Bellows Falls and North Hartland Projects. Therefore, the Taftsville Project does not presently contribute to the cumulative effects on American eel passage in the Ottawaquechee River. However, should the passage efforts at the Bellows Falls and North Hartland Projects succeed, eel movement and migration downstream from Taftsville Dam in the Ottawaquechee River could increase. At that time, the Taftsville Project would cumulatively affect eel in the river by hindering movement and passage through the project area, as well as affect access to upstream habitat and survival of downstream migrating eels. Including Interior's reservation of authority to prescribe fishways at the Taftsville Project license would provide a mechanism to address these potential impacts.

Furthermore, Condition E of the WQC requires that GMP install upstream eel passage at the Taftsville Project within 1 year of upstream passage being installed at the Quechee (Downers Mill) Mills Project (FERC No. 5195). However, there currently is process or plan for developing eel passage at the exempt project. Should upstream eel passage be constructed at Downers Mill in the future, and the effort at the Bellows Falls and North Hartland Projects prove successful, increased eel numbers downstream from Taftsville Dam could trigger a future requirement for upstream eel passage at the Taftsville Project. Thus, it is premature to install upstream eel passage at the project at this time. Rather, installing eel passage at the Taftsville Project would be more appropriately considered as part of a future license amendment proceeding.

⁴⁷ A fish passage facility was first constructed at Holyoke Dam in 1893 but was ineffective.

⁴⁸ See 182 FERC ¶ 61,086 (2023).

3.3.3 Terrestrial Resources

3.3.3.1 Affected Environment

Vegetation

The Taftsville Project is located within the Southern Vermont Piedmont Region, a region with rolling foothills dissected by streams and rivers. The area is mostly forested, but small agricultural areas are present and dominant in the floodplains. Forested areas typically consist of American beech, ash, and yellow birch at the higher elevations. Oak and pine are more common in the Connecticut River valley and on many south-facing slopes. Spruce and fir are also present. Herbaceous vegetation varies, depending on the level of overstory cover, dense canopy cover in areas with a higher percentage of softwood (e.g., balsam fir, eastern hemlock, or spruce) will have sparse herbaceous vegetation including species such as Canada mayflower. Hardwood dominated communities (e.g., silver maple-dominated areas) may have lush herbaceous layers dominated by sensitive fern or ostrich fern (Thompson and Sorenson, 2005). Areas of early successional forest may include higher densities of hardwoods and shrub species such as striped maple or wild raisin.

The project boundary generally follows the shoreline of the Ottauquechee River. The riparian zone of the river zone includes upland and terrestrial wetland habitats. Upland and riparian areas within the project area are dominated by mixed forests characterized by species common to the region such as red maple, American beech, balsam fir, quaking aspen, white birch, and red spruce. Densities of hardwood and softwood species within these areas may vary widely. Much of the riparian zone within the project boundary is intact. Residential areas are dominated by manicured lawns, and occasional transmission rights-of-way which are commonly dominated by weedy herbaceous species with underdeveloped shrub and tree canopies.

Wildlife

Appendix G of GMP's FLA provides a list of mammals, amphibians, reptiles, and birds that may exist or may use habitat in the vicinity of the project, as well as their habitat preferences. Terrestrial habitats within the project boundary are limited, it is likely that many species occur in the project vicinity rather than within the project boundary. Mammals typically found in woodland and riparian areas, which comprise a large portion of project lands bordering the impoundment, include raccoon, long-tailed weasel, striped skunk, and white-footed mouse. Common bat species include the little brown bat and big brown bat. Several species of bats may also use these areas or manmade structures within these areas. Mammals typically found in scrub-shrub or early successional areas include coyote and red fox, and in grassland areas include the meadow vole, house mouse, and the deer mouse. Grassland and agricultural areas are generally uncommon in the project boundary. These habitats are mostly associated with maintained lawns bordering houses nearby.

Species typically found in wetland and open water areas within the project area and in aquatic habitats such as the impoundment and tributaries may include the northern leopard frog, the green frog, bullfrog, pickerel frog, northern spring peeper, and the snapping turtle. Species typically found in woodland areas, including riparian areas, include the spotted salamander,

American toad, gray treefrog, wood frog, and the northern red-backed salamander. Habitats within or near the project include the impoundment, tributaries, wetlands, and riparian areas that may provide breeding, migratory stopovers, and wintering habitat for a high diversity of avifauna including neotropical songbirds, resident species, water birds, and waterfowl. Avian species typically found in wetland habitats that are likely found along the shoreline of the impoundment include red-winged blackbird, various warblers, and song sparrows.

The Ottauquechee River corridor and adjacent wetlands attract a variety of waterfowl that may occur within the project vicinity, including common species such as the wood duck, redhead, American black duck, mallard, and common merganser. Birds known to use wetland and riparian habitats in the vicinity of the project include the belted kingfisher and American bittern. The project area may provide habitat to several species of birds of prey, and many of these species may use habitat in the project boundary on a seasonal basis. Some of these species include osprey, red-tailed hawks, and barred owls. These species may use many different habitat types throughout the year including woodland, scrub-shrub or early successional areas, as well as wetland and open water areas.

Special Status Species

Two rare and state-listed plant species have been identified downstream from the project: Great St. John's-wort (*Hypericum ascyron*) and Garber's sedge (*Carex garberi*). Obedient plant (*Physostegia virginiana* ssp. *virginiana*), a state-listed threatened and rare species in the state, was documented in the project's impoundment by Vermont ANR. GMP completed a Vermont FWD approved rare plant survey within the project boundary in 2020. The study area included the dam area, intake, bypassed reach, substations, powerhouse area, tailrace, and the area of the impoundment which extends from the dam to 0.2 miles upstream. The survey area also encompassed all associated recreational access points upstream of, and downstream from, the dam (figure B-4).

Neither Great St. John's-wort or Garber's sedge were found during the 2020 survey. Five small clumps of obedient plant, also known as false dragonhead, were documented upstream of, and downstream from, the dam, on both riverbanks. It is the only state-listed threatened or endangered species confirmed to exist within the project boundary. Although the species is threatened in Vermont, this listing status only applies to populations found in the Lake Champlain basin. Five other rare and uncommon species were identified during the survey and include: small dropseed (*Sporobolus neglectus*), great blue lobelia (*Lobelia siphilitica*), shore sedge (*Carex lenticularis*), awned flatsedge (*Cyperus squarrosus*), and fescue sedge (*Carex brevior*) (figure B-4).

Migratory bird species protected under the Federal Migratory Bird Treaty Act and the Federal Bald and Golden Eagle Protection Act, with the potential to occur in the project area, include: the bald eagle (*Haliaeetus leucocephalus*); bay-breasted warbler (*Setophaga castanea*); black-billed cuckoo (*Coccyzus erythrophthalmus*); bobolink (*Dolichonyx oryzivorus*); Canada warbler (*Cardellina canadensis*); Cape May warbler (*Setophaga tigrine*); chimney swift (*Chaetura pelagica*); evening grosbeak (*Coccothraustes vespertinus*); lesser yellowlegs (*Tringa flavipes*); olive-sided flycatcher (*Contopus cooperi*); prairie warbler (*Setophaga discolor*); rose-breasted grosbeak (*Pheucticus ludovicianus*); semipalmated sandpiper (*Calidris pusilla*), veery

(*Catharus fuscescens fuscescens*); and wood thrush (*Hylocichla mustelina*) (FWS, 2025). Bald eagles may temporarily occur within the project area, using trees for perching and the impoundment and shoreline for foraging.

Wetlands

The project boundary encompasses approximately 16.4 acres of riverine wetlands. According to the FWS National Wetlands Inventory, 0.43 acres of freshwater emergent wetlands are in the project boundary (FWS, 2025; figure B-5). There are no forested-shrub wetlands within the project boundary. Riverine wetland habitat, like that of the project impoundment, is characterized by a high gradient, with no tidal influence, and some water flows all year, except during years of extreme drought. The substrate consists of rock, cobbles, or gravel with occasional patches of sand. The emergent wetland habitat is characterized as having vegetation present for most of the growing season, usually dominated by perennial plants, with surface water present for brief periods during the growing season, but the water table usually lies well below the ground surface for most of the season.

Invasive Species

During the rare plant survey conducted at the project in 2020, 23 invasive species were identified in the project boundary including garlic mustard, common and Japanese barberry, Japanese and Morrow's honeysuckle, multiflora rose, yellow flag, watercress and purple loosestrife (table C-9; Peters, 2020). Most of these species were found in areas that are not actively managed by GMP.

3.3.3.2 Environmental Effects

Project Operation and Maintenance

Hydropower operation and maintenance can affect wetlands, riparian habitat, and associated wildlife by modifying the frequency and duration of downstream flows and the stability of impoundment water surface elevations. These modifications may alter the availability and quality of nearshore habitats for the species that rely on them. Vegetation management along project facilities can result in the permanent removal of terrestrial habitat or temporary disturbances to the suitability of terrestrial habitat. These activities may affect species composition and density, as well as the structure and function of terrestrial habitats. Additionally, transmission lines and exposed energized components can pose electrocution and collision risks for birds and other wildlife.

As described in [section 2.2, Applicant's Proposal](#), GMP proposes to continue operating the project in run-of-river mode by maintaining stable water levels in the impoundment and releasing a minimum flow of 15 cfs, or inflow, whichever is less, to the bypassed reach. In addition, as discussed in [section 3.3.1.2, Geologic and Soil Resources, Environmental Effects](#), GMP proposes to continue to conduct two planned drawdowns of the project impoundment each year to install and remove the 18-inch flashboards, by lowering the impoundment by about 4.5 feet. Last, GMP proposes to consult with Vermont DEC regarding the timing and duration of

maintenance drawdowns and to conduct the drawdowns in a manner that is protective of nearshore terrestrial habitat.

Vermont ANR recommends, and Condition B of the WQC requires, that GMP operate the project in a true run-of-river mode and provide a continuous, year-round minimum flow of 45 cfs, or inflow, whichever is less, to the bypassed reach.

GMP does not propose any changes to existing vegetation management at the project, which is limited to the areas immediately around project facilities and the recreation areas. GMP proposes to continue to maintain the project's transmission right-of way on a 5- to 7-year cycle for tree removal to ensure safe clearance of the project's power lines,⁴⁹ and restrict the clearing of trees, greater than or equal to 3 inches dbh, between November 1 and March 31 to protect listed bat species, as discussed in [section 3.3.4, *Threatened and Endangered Species*](#). GMP would also consult with Vermont ANR and FWS should any tree removal be required during the active season. No animal protection guards are installed on, or proposed for, the project transmission line or exposed, energized components. No other entity commented on, or provided recommendations to address, potential effects of continued project operation and maintenance on wetlands, riparian habitat, or associated wildlife in the project area.

Our Analysis

Project Operation and Maintenance

Continuing to operate the project as GMP proposes in run-of-river mode and releasing a minimum flow of 15 cfs in the bypassed reach, would not adversely affect terrestrial resources in at the Taftsville Project, as habitat conditions are not expected to change. Increasing bypassed reach flows from 15 cfs to 45 cfs, as recommended by Vermont ANR, and required by Condition B of the WQC, could potentially change sedimentation and erosion up- and downstream of the project. However, given flows at the project often equal or exceed 45 cfs and the morphological characteristics of the river (*see section 3.3.2, [Aquatic Resources](#)*), it is not likely that an increase in minimum flow from 15 cfs to 45 cfs would adversely affect the habitat conditions for any of the special status plant species known to occur at the project.

As discussed above, GMP proposes to maintain minimum flows to the bypassed reach and consult with Vermont ANR regarding the timing and duration of maintenance drawdowns to minimize the effects of flow and water surface elevation fluctuations on terrestrial and aquatic resources. Combined these measures would help to mitigate the effects of drawdowns at the project on terrestrial resources.

Most bird collisions with transmission lines involve waterfowl and other large, heavy-bodied, and less agile birds (APLIC, 2012). Additionally, most electrocutions involve raptor species with large wingspans that enable them to simultaneously touch energized and/or grounded parts of the transmission structures, potentially resulting in electrocution (APLIC and FWS, 2005). As discussed above, numerous raptors, waterfowl, and other large-bodied bird

⁴⁹ See GMP's March 16, 2023, response to the Commission staff's Additional Information Requests on the Final License Application filed on December 16, 2022.

species likely use the project impoundment (e.g., for foraging) or occur within the project boundary. However, the project's primary transmission line is only 40 feet long and there are no reports of bird or other wildlife collisions with the transmission line. Similarly, there are no reports of electrocutions associated with the transformers or other exposed energized components of the project transmission lines. Therefore, there would be no benefit to implementing mitigation measures to prevent wildlife collisions or electrocutions at the project.

Vegetation Management

Vegetation management activities, such as removal, trimming, mowing and weed whacking, have the potential to spread non-native invasive plants that have the potential to reduce local biodiversity and provide lower quality wildlife habitat and foraging opportunities than areas with diverse assemblages of native plants (Swearingen *et al.*, 2014). As discussed, GMP limits vegetation management to areas surrounding the project facilities and project recreation facilities to ensure safe operation of project facilities and maintain recreational access at the project. Based on growth rate data collected in 2015, GMP estimates a maintenance cycle of either 5 or 7 years for tree removal activities in the project's transmission line right-of-way to ensure safe clearance of project's transmission line.⁵⁰ GMP's proposal to restrict the clearing of trees greater than or equal to 3 inches dbh to the inactive season between November 1 and March 31 would help minimize disruption to endangered NLEB. Further, GMP proposes to consult with Vermont ANR and FWS should any tree removal be required during the active season (April 1 through October 31) to help ensure that any potential project effects on NLEB and their habitats are minimized. Condition G of the WQC restricts tree trimming or clearing of trees greater than or equal to 3 inches dbh during the April 1 through October 31 active season. In case of a public safety issue or emergency, where tree trimming or removal are required during the seasonal protective period, Condition G requires that GMP consult with Vermont DEC as soon as practical after conducting the trimming or removal. However, restricting the removal or trimming of all non-hazardous trees and woody vegetation from April 1 through October 31, regardless of branch diameter, and consulting with Vermont DEC as soon as practical if emergency trimming or removal are required during the seasonal protective period, would better protect summer swarming, foraging, and travel habitat for NLEB and tricolored bats, as well as habitat for migratory birds in the project area during their active season.

While it does not conduct specific invasive species management at the project, GMP does focus on preventing the movement of invasive species into new areas where practicable. Much of the riparian zone in the project boundary is intact and GMP does not maintain vegetation in these areas. Continuing GMP's current vegetation management practices would keep vegetation trimming to a minimum while maintaining access to project structures. Given the small amount of upland habitat within the project boundary and limited scale of trimming activities, vegetation management is expected to have minimal negative effects on the spread of non-native invasive species.

⁵⁰ *Id.*

Project Recreation

GMP proposes to continue to operate and maintain the project recreation facilities, which consist of a parking area, picnic area, bank fishing area and viewing platform on the west shore of the impoundment, and a canoe portage on the east side of the impoundment. No new construction or modifications to the project's facilities are proposed. No other entity commented on, or provided recommendations to address, potential effects of recreation related activities on terrestrial resources.

Our Analysis

As previously stated, GMP limits vegetation management to areas around the project's dam and powerhouse, transmission line right-of way, and recreation facilities. GMP does not perform vegetation management at recreation facilities where special status species are likely to occur, except when necessary to ensure safe project operation. In areas where vegetation management does occur, GMP follows best management practices (BMPs) of either surveying and avoiding target species, targeting vegetation management during dormancy periods, or consulting with Vermont ANR for alternative practices.⁵¹ GMP uses additional BMPs to minimize effects to aquatic species, including minimal herbicide use, limiting the application of herbicides with aquatic labels to up to 10 feet away from surface waters and limiting the use of all other herbicides to at least 30 feet away from surface waters.

Continued operation and maintenance of the project's recreation facilities as GMP proposes, following the BMPs outlined above, would continue to ensure adequate recreational access at the project and would not impose any changes to terrestrial habitat within the project boundary. For these reasons, we do not anticipate that relicensing the project as currently proposed by GMP would adversely affect terrestrial resources at the project. Additionally, although rare plant species, such as the awned flatsedge, are located at the project, Vermont ANR indicated in its WQC that it was unlikely that project activities would harm these plant populations or pose a threat to these species' persistence.⁵²

3.3.4 Threatened and Endangered Species

3.3.4.1 Affected Environment

Section 7 of the ESA requires federal agencies to ensure their actions are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. On June 20, 2025, staff accessed the FWS's Information for Planning and Consultation (IPaC) database to determine whether any federally listed species could occur in the vicinity of the project. According to the IPaC database, the endangered northern long-eared bat (*Myotis septentrionalis*)

⁵¹ *Id.*

⁵² See page 22 under section K, *Rare, Threatened, and Endangered Species* of Vermont ANR's WQC, filed on July 28, 2025.

(NLEB),⁵³ and the proposed threatened monarch butterfly (*Danaus plexippus*),⁵⁴ may occur in the project vicinity.⁵⁵ In addition, FWS proposed on September 14, 2022, to list the tricolored bat (*Perimyotis subflavus*) as endangered.⁵⁶ Although tricolored bat does not appear on the IPaC species list, staff have confirmed that the project is within the species' range, and, therefore, could be present in the project vicinity. No critical habitat has been designated for the NLEB and no critical habitat is proposed for the monarch butterfly or tricolored bat.

Our analyses of project impacts on the NLEB, monarch butterfly, and tricolored bat are summarized here and presented in full in [Appendix E, Biological Assessment](#). Although proposed species are provided no special protection under the ESA, we nevertheless provide an analysis of the proposed action on these species because they may later be added to the list of federally endangered and threatened species.

Listed Species

Northern Long-Eared Bat

Although no tree-clearing activities are proposed, project maintenance activities over the term of any license could require periodic tree-trimming or tree removal that may affect NLEB and tricolored bat habitat. Avoiding the trimming, cutting, manipulation, or removal of all non-hazardous trees from April 1 through October 31, would protect the NLEB and tricolored bat during their active season, as discussed in [section 3.3.3.2, Environmental effects, Vegetation Management](#) and in [Appendix E, Biological Assessment](#). By letter generated through IPaC's Northern Long-Eared Bat Range-wide Determination Key on June 20, 2025, FWS concluded that relicensing the project with this measure may affect, but is not likely to adversely affect, the NLEB.⁵⁷

Proposed Species

Tricolored Bat

Project maintenance activities that could affect the tricolored bat are the same as those noted for the NLEB. Additionally, tricolored bats roost in leaf clusters of woody plants, including those smaller than 3 inches in diameter, making them vulnerable to disturbance during

⁵³ 88 Fed. Reg. 4908-4910 (January 26, 2023).

⁵⁴ FWS proposed to list the monarch butterfly as endangered on December 12, 2024. *See* 89 Fed. Reg. 100,662 (Dec. 12, 2024).

⁵⁵ *See* Commission staff's June 20, 2025, Memorandum on FWS' List of Threatened, Endangered, Candidate, and Proposed Species; *see also* IPaC, FWS, <https://ipac.ecosphere.fws.gov/>.

⁵⁶ 87 Fed. Reg. 56,381 (Sept. 14, 2022).

⁵⁷ *See* Commission staff's June 20, 2025, Memorandum on Streamlined Consultation for the Northern Long-Eared Bat Using the Northern Long-eared Bat Range-wide Determination Key.

any tree-clearing activities, regardless of tree size.⁵³ Avoiding the trimming, cutting, manipulation, or removal of all trees and woody plants from April 1 through October 31 would protect the tricolored bat from project effects, as discussed in [section 3.3.3.2, *Environmental effects, Vegetation Management*](#) and in [Appendix E, *Biological Assessment*](#). We conclude that relicensing the project as proposed by GMP with additional staff recommended measures would not preclude the survival and recovery of, and therefore would not jeopardize the tricolored bat.

Monarch Butterfly

Milkweed stands are not likely to be present for monarch butterfly reproduction or foraging in areas where routine vegetation trimming occurs during the growing season; therefore, significant effects to monarch butterflies are not likely. Any project effects on monarch butterflies would be incidental and minor and would have an insignificant effect on the butterfly and its habitat. We conclude that relicensing the project as proposed by GMP with additional staff recommended measures would not preclude the survival and recovery of, and therefore would not jeopardize the monarch butterfly.

3.3.5 Recreation, Land Use, and Aesthetics

3.3.5.1 Affected Environment

Recreation Overview

Numerous opportunities to pursue a wide variety of traditional active and passive recreation activities exist near the Taftsville Project. The Ottauquechee River provides opportunities for fishing, whitewater boating, tubing, swimming, sightseeing, and wildlife viewing. Vermont FWD stocks the Ottauquechee River between Bridgewater and Taftsville and the North Hartland Reservoir with rainbow trout. In addition, various cold and warm water fish species inhabit the Ottauquechee River. Several swimming holes occur throughout the Ottauquechee River in Woodstock, Taftsville, and Quechee, Vermont. Popular whitewater boating reaches include a Class II run between West Bridgewater and Woodstock and the reach from Dewey's Mill dam downstream through Quechee Gorge which is rated as Class III+(V). A boat launch just upstream of North Hartland Dam provides access to the Ottauquechee River between the North Hartland Reservoir and the Quechee Gorge. In addition, car-top boat rentals are available at Dewey's Pond (approximately 5 RM downstream from Taftsville Dam) which can be used throughout the Ottauquechee River.

The towns surrounding the Taftsville Project provide a variety of recreation facilities for use throughout the year. In Woodstock, opportunities for biking, horseback riding, golf, fishing, paddling, scenic viewing, swimming, hiking, visiting historic sites and museums, snowshoeing, and cross-country skiing all exist within a short distance of the Taftsville Project. The Walk Woodstock Trail System provides over 30 miles of trails connecting the village center with various open spaces including Billings Park, Mount Peg, Mount Tom, Faulkner Park, and King Farm. In addition, Woodstock contains four town forests: Billings Park at Mount Tom, Billings Park at Mount Peg, Billings Lot, and Long Hill Block. Recreation opportunities in the Hartland area include the Hartland Town Forest, bog, the North Hartland Recreation Area, the Sumner Falls Recreation Area, the Densmore Hill Wildlife Management Area, and the North Hartland Reservoir. An extensive system of parks and recreation facilities are also available in the town

of Hartford. Overall, the Town of Hartford maintains twelve parks, a town forest and wildlife refuge park, conservation areas, and the Hartford Municipal Arena which includes a pool and outdoor recreation facility. These parks provide playgrounds, sport fields, picnic areas, ice skating areas, fishing and boat access, walking and hiking trails, and scenic overlooks. Snowshoeing, cross-country skiing, and ice skating are also available on Dewey's Pond in the winter. Finally, there are five state parks within approximately 20 miles of the Taftsville Project, and one federal park, the Marsh-Billings-Rockefeller National Historic Park, is located approximately 2 miles west of the Taftsville Project.

Project Recreation

There are multiple recreation opportunities at the Taftsville Project (figure 2). On the west shore of the project, recreation facilities include a parking area near the powerhouse that allows room for eight vehicles with an American with Disabilities Act (ADA) compliant parking spot, a picnic area (two picnic tables, one is ADA compliant), and a viewing and bank fishing platform. On the east shore of the project, GMP provides an approximately 500-foot-long canoe portage trail with take-out/car-top boat launch and put-in areas. The portage trail is the only recreational feature that lies just outside the project boundary; running alongside Old River Road and Gravel Ledge Road⁵⁸ from the car-top boat launch and take-out area, before crossing Covered Bridge Road which leads to the canoe put-in area in the bypassed reach (figure 2). Based on estimates from GMP, project recreation use at the access areas, picnic area, and canoe portage is 25% or less.⁵⁹

Land Use

The Taftsville Project resides within the Hamlet of Taftsville on the eastern side of the town of Woodstock in Windsor County, Vermont. The town of Woodstock includes a main village and four hamlets including South Woodstock, West Woodstock, Prosper, and Taftsville. Zoning west of Taftsville is regulated by the town of Woodstock, while the east is regulated by the Town of Hartford. The western shore of the Ottauquechee River in Windsor County is zoned for residential use, and the eastern shore is primarily conserved lands (Town of Woodstock, 2019). Within a 1-mile buffer of the Taftsville Project, 64% of the land is forested, followed by agriculture (21%), open space (5%), and developed areas (4%) (Hartford Planning Commission, 2019). Known for its historic appeal, the Hamlet of Taftsville is a quiet, scenic residential area along US Route 4, centered around the historic Taftsville Covered Bridge.

⁵⁸ In the FLA, there are two different paths showing the canoe portages. Figure 4.15 in the FLA at pdf page 151, the canoe trail is shown running closer to the shore along Gravel Ledge Road. However, Figure Sheet S1 in the FLA, on pdf page 444, the canoe portage is shown to cross Gravel Ledge Road, where it runs along Old River Road, eventually merging back with Gravel Ledge Road. In both scenarios, the canoe portage is outside the project boundary.

⁵⁹ See *CVPS's FERC Form 80* filed on January 5, 2004, at p. 1, and on March 30, 2009, on p. 20; See *GMP's FERC Form 80* filed on April 1, 2015, at p. 1.

Aesthetics at the Project

The surrounding towns of Woodstock and Hartford are characteristically New England with densely settled central villages surrounded by rolling hills, open woodlands, forests, and agricultural fields between narrow mountain valleys and scenic ridgelines. The town of Woodstock provides views of fields, forests, streams, and valley floors with views of Mount Ascutney, Killington, and the Green Mountains in the distance (Town of Woodstock, 2016).

Taftsville is characterized by its historic architecture, forested hillsides, and the Ottauquechee River flowing through the center. A key historic and visual landmark is the Taftsville Covered Bridge, which is one of Vermont's oldest and longest historic covered bridges. This historic bridge spans the bypassed reach and tailrace of the Taftsville Project. The Ottauquechee River in the Taftsville Project area flows through a narrow, incised valley with rocky hills and steep slopes.

At the low-head concrete Taftsville Dam, GMP releases a minimum continuous veiling flow of about 1 inch (equal to 15 cfs) over the dam's spillway and into the bypassed reach to enhance aesthetics and aquatic habitat at the project. The Taftsville Impoundment extends 4,600 feet upstream and is bordered by US Route 4 to the west, a busy road connecting Woodstock and Hartford, and Old River Road and vegetated areas to the east. The bypassed reach below the dam contains large bedrock outcrops, a deeper channel, a few pools, and a rocky shoreline.

3.3.5.2 Environmental Effects

Recreation and Land use

GMP proposes, and Condition H of the WQC requires, that GPM continue to operate and maintain the project recreation facilities, consisting of a parking area, picnic area, bank fishing area and viewing platform on the west shore of the impoundment, and a canoe portage on the east side of the impoundment. No new construction or modifications to the project's facilities, including recreation areas are being proposed, and licensing stakeholders do not recommend any measures specific to recreation.

Aesthetics

GMP proposes to continue to release 15 cfs, or inflow, whichever is less, into the bypassed reach via spill over the dam crest to enhance aesthetics and aquatic habitat in the bypassed reach downstream from the dam. This release provides a minimum veiling flow of about 1 inch over the dam crest. In addition, Vermont ANR recommends, and Condition B of the WQC requires, that GMP release a continuous minimum flow of 45 cfs, or inflow if less, to the bypassed reach year-round, via spillage over the dam, as well as spill all inflow at the dam when the project is not operating, to improve aquatic habitat in the reach.

Our Analysis

No recreation or land use issues were identified by the applicant, resource agencies, or stakeholders. Maintenance and operation of project recreation facilities as GMP proposes would continue to provide adequate recreational access at the project, while not imposing any changes

to land use within or near the project boundary. Furthermore, GMP's proposal to continue releasing a minimum veiling flow of about 1 inch (equal to 15 cfs) over the dam's spillway and into the bypassed reach would continue to provide adequate aesthetics at the project dam. Although, increasing minimum flows from 15 cfs to 45 cfs, as recommended by Vermont ANR, and required by Condition B of the WQC, may offer enhanced aesthetics at the project, there is no evidence indicating that 15 cfs does not provide an adequate veil flow for aesthetics purposes at the project.

3.3.6 Cultural Resources

3.3.6.1 Affected Environment

Cultural resources represent things, structures, places, or archaeological sites that can be either prehistoric or historic in origin. Pursuant to section 106 of the NHPA, the Commission must take into account whether any historic property within the proposed project's [area of potential effects](#) (APE) could be affected by the issuance of a license for the project.

The project APE is the "geographic area or areas within which an [undertaking](#) may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist."⁶⁰ The proposed Taftsville Project APE includes all lands within the project boundary, which extends approximately 4,600 feet upstream of the dam on both sides of the river, and downstream from the dam approximately 155 feet. The APE extends downstream to include the portion of the canoe portage located within the project boundary, as well as the Taftsville Covered Bridge.⁶¹ The proposed APE also extends approximately 33 feet beyond the project boundary around the impoundment, except for areas along Old River Road on the east bank and Route 4 on the west bank where the APE extends to the edge of the road rights-of-way (i.e., less than 33 feet beyond the project boundary).

Cultural and Historical Context

The earliest known archaeological remains in Vermont date to the Paleoindian period. These sites were created by small groups of hunter-gatherers who colonized the recently deglaciated sections of the state during the Paleoindian Period. Artifact assemblages from these sites show that several types of artifacts are consistently present in sites dating to the Paleoindian Period, particularly fluted projectile points made from chert. Occupation of the area continued through the Archaic period which began 10,000 years ago following the end of the Pleistocene and the beginning of the Holocene. It is further subdivided into at least three periods, largely demarcated by changes in projectile point styles, and ending 3,000 years ago.

⁶⁰ 36 C.F.R. § 800.16(d).

⁶¹ Per the draft HPMP filed on November 13, 2023, GMP is not responsible for historic resources management of the bridge and associated roadways, or the lands surrounding the portage trail owned by a private entity for which GMP holds a right-of-way for the portage trail on the south side of Covered Bridge Road. (see proposed APE in figure B-6).

From 3,000 BP to 1600 AD, the Woodland period culture in the region was marked by the development of ceramics. This new technology allowed for the production of containers that could be used for cooking. Ceramics also enhanced the capability to store food. The ability to store larger amounts of food made it possible for people to become more sedentary. In addition to cooking and food storage, ceramics were often elaborately decorated and may have been used in ceremonies. These types of ceramics were part of the rich grave-good assemblages.

There are few sights dated to the Early Woodland period in Vermont. Middle Woodland sites in western Vermont such as Winooski illustrate the use of areas along the lower reaches of rivers flowing into Lake Champlain. These sites indicate the presence of large groups of people who were hunting and gathering.

The Late Woodland period in the northeast is associated with the introduction of horticulture, particularly the importation of domesticated maize. However, it is more than likely that maize did not appear in New England until after about 1300 AD, several centuries after the Iroquois to the west had adopted it. Although maize was common throughout New England, in Vermont and elsewhere in New England, there is little evidence for the development of large sedentary villages based on maize horticulture. Rather, archaeological evidence indicates that people remained mobile hunter-gatherers, only using maize as a dietary supplement.

With the arrival of European settlers in the early 17th century, Vermont underwent dramatic changes. The Contact period, extending into the mid-18th century, was a period of intense conflict between the Western Abenaki and the new European settlers. In particular, the region was a part of the broader conflict between the French, with their base in Canada, and the English, located throughout New England and in the new colony of New York. Each of these European nations jockeyed for position in control over the American colonies, including forging alliances with the region's various Native American nations.

Taftsville is a community in the Town of Woodstock. The first English settlers arrived in 1768. Taftsville grew slowly through the Revolutionary War, but economic growth accelerated with the end of the war and the development of grist and sawmills that used the Ottauquechee River's waterpower. In 1793 Stephen Taft, a blacksmith, arrived in Woodstock from Uxbridge, Massachusetts and settled downstream from the village known now as Taftsville. A year later, he erected a wood crib dam across the Ottauquechee River, he and his brother Daniel began work on a sawmill on the north side of the river, along with a metalworking shop on the south side, both of which were completed in 1796. The metalworking shop had become the family's principal business that had a good reputation for its scythes. In the early- to mid-19th century Daniel's sons became co-owners of the company, which then expanded with a new furnace and a new line of metal items such as stoves, axes, and plows.

In the 1840s, Taftsville reached its greatest size, with a population of more than 3,400. As one of the largest towns in Vermont, it had strong economic connections throughout Vermont. Sheep raising became a prosperous industry throughout New England, and Taftsville, like many other Vermont towns, had a large woolen mill in constant operation. There were also grist mills, tanneries, woodworking shops, silversmiths, jewelers, and cabinetmakers in the village.

By the end of the Civil War, the economic influence of Taftsville had begun to diminish. In 1875, the town was given an economic lift by the completion of the Woodstock Railroad. In 1934, one of the first powered rope ski tows in the United States was built on a hill outside Taftsville, and the area became a popular winter vacation spot.

Today, Taftsville relies heavily on tourism largely based on its well-preserved, 19th century architecture.

Prehistoric and Historic Archaeological Resources

Taftsville Dam, as well as the powerhouse and substations are listed on the National Register of Historic Places (National Register) and documented in the registration form as contributing structures to the Taftsville [Historic District](#). These Taftsville Project components serve as the last remnants of the water powered industry that sustained Taftsville through much of its history starting in 1793. The Taftsville Historic District comprises 52 contributing buildings, 1 contributing site, and 4 contributing structures.

Since 2003, continuous monitoring has found no substantial erosion, nor any new archaeological sites. The project vicinity was historically inhabited by the Abenaki Tribe. However, there are no Native American lands or known traditional cultural or religious properties identified within the project boundary.

3.3.6.2 Environmental Effects

Project-related effects on cultural resources within the APE can result from: (1) modifications to project facilities or project operation; (2) project-related ground-disturbing activities; (3) construction, modification, or maintenance of project recreation facilities and use of such facilities by visitors; (4) [project-induced shoreline erosion](#); and (5) vandalism. GMP proposes to continue operating the Taftsville Project in run-of-river mode with existing minimum bypass flows. No construction activities or changes to existing project buildings, facilities, or other structures are proposed or anticipated. GMP proposes to continue to consult with pertinent resource agencies regarding the timing and duration of periodic maintenance drawdowns. GMP proposes to consult with the Vermont Division for Historic Preservation (DHP) for such activities to minimize potential effects on cultural resources. In addition, GMP proposes to update the existing Cultural Resources Management Plan with an HPMP, in consultation with the Vermont DHP. A draft HPMP was filed with FERC and submitted to Vermont DHP in November 2023. The draft HPMP provides updated management information and consultation procedures that would be implemented during the continued operation of the Taftsville Project for any new license term.

Our Analysis

Section 106 of the NHPA requires the Commission to consider the effect of licensing a hydropower project on historic properties within the APE. Vermont DHP reviewed the draft HPMP and recommended extending the APE to include the downstream area of the covered bridge and the canoe portage area. GMP agreed to adjust the APE.

Extending the APE downstream of the covered bridge and canoe portage area is necessary to include the partitioned area of the project boundary that encompasses the downstream portion of the canoe portage and canoe put-in area in the bypassed reach immediately downstream from the covered bridge (*see* figure 2 and figure B-6). However, the proposed project boundary is to encompass the geographic area in which the project's licensing may directly or indirectly cause alterations in the character or use of any historic properties. In this case, there is no justification for extending the APE 33 feet beyond the impoundment shoreline, and to include additional land in the APE not needed for project purposes. Therefore, the APE should only include the land within the project boundary (i.e., land needed for project purposes).

GMP is not proposing to modify project operation or conduct any project-related land-clearing or land-disturbing activities within the APE that would impact any archaeological site or historic property. Stable impoundment levels due to run of-river operation are not expected to affect cultural resources in the APE. Therefore, no adverse effects to cultural or historical resources are anticipated. However, continued operation and maintenance of the project, including ground-disturbing activities that may be needed in the future, have the potential to affect existing [archaeological resources](#) or historic properties during any new license term.

To resolve any potential adverse effects to historic properties, including those cultural resources determined eligible for the National Register (the Taftsville Historic District: 52 contributing buildings, one site, and four contributing structures), the draft HPMP provides procedures and protocols involving National Register evaluations, monitoring of historic properties, annual reporting, treatment of unanticipated discoveries and burial remains, training of project personnel, and a provision to review and revise the HPMP.

The November 2023 draft HPMP is adequate to address any potential effects to historic properties within the project boundary for any new license term but would need to be modified to reflect the APE that does not include the 33-foot buffer for the reasons discussed above. Therefore, to meet section 106 requirements, the Commission intends to execute a PA with the Vermont State Historic Preservation Office (Vermont SHPO). The terms of the PA would require GMP to implement a final PA, for the term of any license issued for the project.

3.4 NO-ACTION ALTERNATIVE

Under the no-action alternative, the Taftsville Project would continue to operate as it has under its current license.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the project's use of the Ottauquechee River for hydropower purposes to see what effect various environmental measures would have on the project's costs and power generation. Under the Commission's approach to evaluating the economics of

hydropower projects, as articulated in *Mead Corp.*,⁶² the Commission compares the current project cost to an estimate of the cost of obtaining the same amount of energy and capacity using a likely alternative source of power for the region (cost of alternative power). In keeping with Commission policy as described in *Mead Corp.*, our economic analysis is based on current electric power cost conditions and does not consider future escalation of fuel prices in valuing the hydropower project's power benefits.

For each of the licensing alternatives, our analysis includes an estimate of: (1) the cost of individual measures considered in the EA for the protection, mitigation and enhancement of environmental resources affected by the project; (2) the cost of alternative power; (3) the total project cost (i.e., for construction, operation, maintenance, and environmental measures); and (4) the difference between the cost of alternative power and total project cost. If the difference between the cost of alternative power and total project cost is positive, the project produces power for less than the cost of alternative power. If the difference between the cost of alternative power and total project cost is negative, the project produces power for more than the cost of alternative power. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license. However, project economics is only one of many public-interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

4.1 POWER AND DEVELOPMENTAL BENEFITS OF THE PROJECT

[Appendix G, Developmental Resources](#), summarizes the assumptions and economic information we use in our analysis for the project. This information was provided by the applicant in their license application and subsequent submittals. We find that the values provided by the applicant are reasonable for the purposes of our analysis. Cost items common to all alternatives include: taxes and insurance costs; estimated capital investment required to develop the project; licensing costs; normal operation and maintenance cost; and Commission fees. All costs have been adjusted to December 2024 dollars.

4.2 COMPARISON OF ALTERNATIVES

[Appendix G, Developmental Resources](#), summarizes the installed capacity, annual generation, cost of alternative power, estimated total project cost, and difference between the cost of alternative power and total project cost for each of the alternatives considered in this EA: no-action, the applicant's proposal, the staff alternative, and staff alternative with mandatory conditions.

4.3 COST OF ENVIRONMENTAL MEASURES

[Appendix G, Developmental Resources](#), shows the applicant's proposed environmental protection and enhancement measures, staff-recommended additions, deletions, and modifications to these measures, mandatory conditions, and the estimated cost of each. We

⁶² See *Mead Corp.*, 72 FERC ¶ 61,027 (July 13, 1995). In most cases, electricity from hydropower would displace some form of fossil-fueled generation, in which fuel cost is the largest component of the cost of electricity production.

convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. This section contains the basis for, and a summary of, our recommendations for relicensing the project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Based on our independent review of agency and public comments filed on the project and our review of the environmental and economic effects of the proposed project and project alternatives, we selected the staff alternative as the preferred alternative. We recommend this alternative because: (1) issuing a subsequent license for the project would allow GMP to continue to operate the project as a dependable and inexpensive source of electrical energy; (2) the 0.5 MW of electric capacity comes from a renewable resource that does not contribute to atmospheric pollution; (3) the public benefits of the staff alternative would exceed those of the no-action alternative; and (4) the proposed and recommended measures would enhance aquatic and recreational resources, and protect wildlife resources at the project.

In the following section, we make recommendations as to which environmental measures proposed by GMP or recommended by agencies or other entities should be included in any subsequent license issued for the project. In addition to GMP's proposed environmental measures listed below, we recommend additional staff-recommended environmental measures to be included in any license issued for the project.

5.1.1 Measures Proposed by GMP

Based on our environmental analysis of GMP's proposal in [section 3, *Environmental Analysis*](#), and the costs presented in [section 4, *Developmental Analysis*](#), we conclude that the following environmental measures proposed by GMP would protect and enhance environmental resources and would be worth the cost. Therefore, we recommend including these measures in any license issued for the project.

- Continue operating the project in run-of-river mode, such that outflow from the project approximates inflow.
- Continue to release 15 cfs, or inflow, whichever is less, into the bypassed reach via spill over the dam crest to enhance aquatic habitat in the bypassed reach and downstream from the dam.
- Continue to maintain 18-inch wooden flashboards on the spillway, by removing them in the fall and replacing them in the spring.

- Consult with Vermont DEC prior to conducting maintenance and repair work that has the potential to adversely affect water quality.
- Consult with Vermont DEC regarding the timing and duration of periodic maintenance drawdowns of the impoundment and maintain minimum flow requirements to the bypassed reach during any maintenance drawdowns.
- Restrict the removal of trees greater than or equal to 3 inches dbh in the project boundary to the period of November 1 through March 31 to protect the northern-long-eared bat, as modified by the staff alternative below.
- Continue to operate and maintain the project recreation facilities that consist of a parking area, picnic area, bank fishing area and viewing platform on the west shore of the impoundment, and a canoe portage on the east side of the impoundment.
- Update the draft HPMP to address and mitigate project effects on historic properties.

5.1.2 Additional Measures Recommended by Staff

In addition to GMP's proposed measures noted above, we recommend including the following additional measures in any license that may be issued for the Taftsville Project.

- Develop an operation compliance monitoring plan to document compliance with run-of-river operation and any required minimum flow releases, and that includes provisions for monitoring and reporting compliance with run-of-river operation, minimum flows, impoundment water levels, and timing of planned maintenance, as well as reporting deviations from operating requirements to the Commission and Vermont ANR.
- Avoid the trimming or removal of non-hazardous trees, regardless of dbh, from April 1 through October 31 to protect the NLEB and tricolored bat.

In [Appendix H, Comprehensive Development and Recommended Alternative](#), we discuss the basis for our additional staff-recommended measures and the rationale for modifying GMP's proposal.

5.2 UNAVOIDABLE ADVERSE EFFECTS

Although fish kills have not been documented at the project, some resident fish are likely to pass downstream through the project's turbine and could be injured or killed. However, there is no evidence that any fish entrainment and mortality is having a significant effect on the river's fish populations, and we would not expect any long-term effects on the aquatic community from this unavoidable project effect.

5.3 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA, 16 U.S.C. §803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We

reviewed the following 18 qualifying comprehensive plans that are applicable to the Taftsville Project. No inconsistencies were found.

- Atlantic States Marine Fisheries Commission. 2000. Interstate Fishery Management Plan for American eel (*Anguilla rostrata*). (Report No. 36). April 2000.
- Atlantic States Marine Fisheries Commission. 2008. Amendment 2 to the Interstate Fishery Management Plan for American eel. Arlington, Virginia. October 2008.
- Atlantic States Marine Fisheries Commission. 2013. Amendment 3 to the Interstate Fishery Management Plan for American eel. Arlington, Virginia. August 2013.
- Atlantic States Marine Fisheries Commission. 2014. Amendment 4 to the Interstate Fishery Management Plan for American eel. Arlington, Virginia. October 2014.
- Connecticut River Atlantic Salmon Commission. 2023. Connecticut River American Eel Management Plan. Sunderland, Massachusetts. June 9, 2017, updated February 28, 2020, and June 28, 2022.
- Connecticut River Joint Commissions. 1997. Connecticut River Corridor Management Plan. Volume 1: Riverwide Overview – Upper Connecticut River in New Hampshire and Vermont. Charlestown, New Hampshire. May 1997.
- Connecticut River Joint Commission. New Hampshire Department of Environmental Services. 2013. Connecticut River Recreation Management Plan: Upper Valley Region. Concord, New Hampshire.
- National Park Service. 1993. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C.
- U.S. Fish and Wildlife Service. n.d. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C.
- Vermont Agency of Environmental Conservation. 1986. Vermont Rivers Study. Waterbury, Vermont.
- Vermont Agency of Natural Resources. 1986. The waterfalls, cascades, and gorges of Vermont. Waterbury, Vermont. May 1986.
- Vermont Agency of Natural Resources. 1988. Hydropower in Vermont: an assessment of environmental problems and opportunities. Waterbury, Vermont. May 1988.
- Vermont Agency of Natural Resources. 1988. Wetlands component of the 1988 Vermont recreation plan. Waterbury, Vermont. July 1988.
- Vermont Department of Fish and Wildlife. 2015. Vermont's Wildlife Action Plan. Montpelier, Vermont.
- Vermont Fish and Wildlife Department. 2017. Statewide Management Plan for Largemouth and Smallmouth Bass. Montpelier, Vermont. August 2017.
- Vermont Agency of Natural Resources. 2018. Black and Ottauquechee Rivers Tactical Basin Plan. Montpelier, Vermont. June 2018.
- Vermont Department of Fish and Wildlife. 2018. The Vermont Plan for Brook, Brown, and Rainbow Trout. Montpelier, Vermont. January 2018.

Vermont Department of Forests, Parks and Recreation. 2019. Vermont State Comprehensive Outdoor Recreation Plan (SCORP): 2019-2023. Montpelier, Vermont. August 2019.

Vermont Department of Environmental Conservation, Vermont Department of Fish and Wildlife, and U.S. Fish and Wildlife Service. 2002. Recovery Plan for Twelve Vermont Freshwater Mussel Species. Underhill, Vermont. July 2002.

Vermont Department of Environmental Conservation, Vermont Department of Fish and Wildlife, and U.S. Fish and Wildlife Service. 2022. Recovery Plan for Twelve Vermont Freshwater Mussel Species. Underhill, Vermont. July 2022.

Vermont Agency of Natural Resources. 2023. Ottauquechee, Black Rivers and Connecticut River Direct Tributaries Basin 10 Tactical Basin Plan. Montpelier, Vermont. September 2023.

Vermont Department of Forests, Parks and Recreation. 2024. Move Forward Vermont: Vermont's Statewide Comprehensive Outdoor Recreation Plan. Montpelier, Vermont. December 2024.

6.0 FINDING OF NO SIGNIFICANT IMPACT

If the Taftsville Project is issued a subsequent license as proposed with the additional staff-recommended measures, the project would continue to operate, while enhancing and protecting aquatic and terrestrial resources, federally threatened and endangered species, recreation and aesthetics, and cultural resources in the project area. Based on our independent analysis, the issuance of a subsequent license for the Taftsville Project, with additional staff-recommended environmental measures, would not constitute a major federal action significantly affecting the quality of the human environment.

7.0 LITERATURE CITED

The literature cited in this EA is presented in [Appendix I](#).

8.0 LIST OF PREPARERS

The list of preparers of this EA is presented in [Appendix J](#).

APPENDIX A: GLOSSARY OF TERMS

7Q10: A statistical estimate of the lowest average streamflow that would occur during a consecutive 7-day period with an average recurrence interval of ten years.

Approach velocity: The velocity of water as it approaches the trash rack and is defined as the average water velocity measured a few inches in front of an intake screening device (e.g., trash rack) (EPRI, 2000).

Area of Potential Effects (APE): The geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties (36 C.F.R. § 800.16(d)).

Archaeological resources: The material remains of past human activity, including, but not limited to: man-made or modified objects; refuse left through human occupation or consumption; as well as earthworks and structural ruins associated with past human activity or occupation.

Burst swim speed: The highest speeds attainable by fish and that can be maintained for brief periods, usually lasting up to a few seconds (Beamish, 1978).

Capacity benefit: The benefit a project receives for providing capacity to the grid, which may be in the form of a dependable capacity credit or credit for monthly capacity provided.

Coldwater fishes/species: Fish species that prefer water temperatures less than or equal to 68 °F and tolerate maximum temperatures less than or equal to 87.8 °F (Lyons et al., 2009).

Diadromous – Fish that migrate between freshwater and saltwater to complete part of their lifecycle.

Diameter at breast height: The diameter of a tree as measured about 4 to 4.5 feet above the ground.

Historic district: A geographically definable area, urban or rural, that possesses a concentration, linkage or continuity of sites, buildings structures, or objects united by past events or aesthetically by plan or physical development (National Park Service, 1990).

Historic properties: Cultural resources that are eligible for listing or listed on the National Register of Historic Places.

Mesohabitat: A moderately-sized habitat unit that is visually distinct such as a riffle, glide, run, or pool.

National Register of Historic Places (National Register): A catalog of America's significant districts, sites, buildings, structures, and objects related to architecture, archeology, engineering, and culture.

New license: Any license, except an annual license issued under section 15 of the Federal Power Act, for a waterpower project that is issued under the Federal Power Act after the initial license for that project. 18 C.F.R. § 4.30(b)(19).

Physical Habitat Simulation Model (PHABSIM): A computer model that is used to quantify changes to physical microhabitat suitability relative to attributes of selected species and life stages as a function of discharge. To develop the model, mesohabitat types are mapped within a study reach and transects are surveyed for microhabitat information (depth, velocity, and substrate) in representative mesohabitat types within the study reach.

Project-induced shoreline erosion: Erosion associated with project operation, not including erosion attributable to flood flows or phenomena, such as wind-driven wave action, erodible soils, and loss of vegetation due to natural causes.

Riparian habitat: Area between the upland vegetation community and the riverine environment that is typically dominated by forested floodplains, wetlands, and uplands.

Stratification: Phenomenon that occurs when water bodies form distinct thermal layers, including a warm surface layer (epilimnion), a middle layer (metalimnion) with an abrupt change in temperature (thermocline), and a cool dense lower layer (hypolimnion). Persistent stratification can result in low DO concentrations in the lower part of the water column.

Subsequent license: A license for a waterpower project that is issued under Part I of the Federal Power Act after the expiration of a minor license that is not subject to sections 14 and 15 of the Federal Power Act. 18 C.F.R. § 16(2)(d) (2024).

Through-screen velocity: The speed at which water travels through the openings or mesh of screens (or intake structures), as opposed to the speed approaching the face of the screen.

Undertaking: A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by, or on behalf of, a federal agency; those carried out with federal financial assistance; and those requiring a federal permit, license, or approval.” 36 C.F.R. § 800.16 (y) (2022). For purposes of this NEPA document, the undertaking is the potential issuance of a subsequent license for the Taftsville Project.

Warmwater fishes/species: Fish species that prefer water temperatures greater than or equal to 71.6 °F and tolerate maximum temperatures greater than or equal to 91.4 °F (Lyons et al., 2009).

APPENDIX B: FIGURES

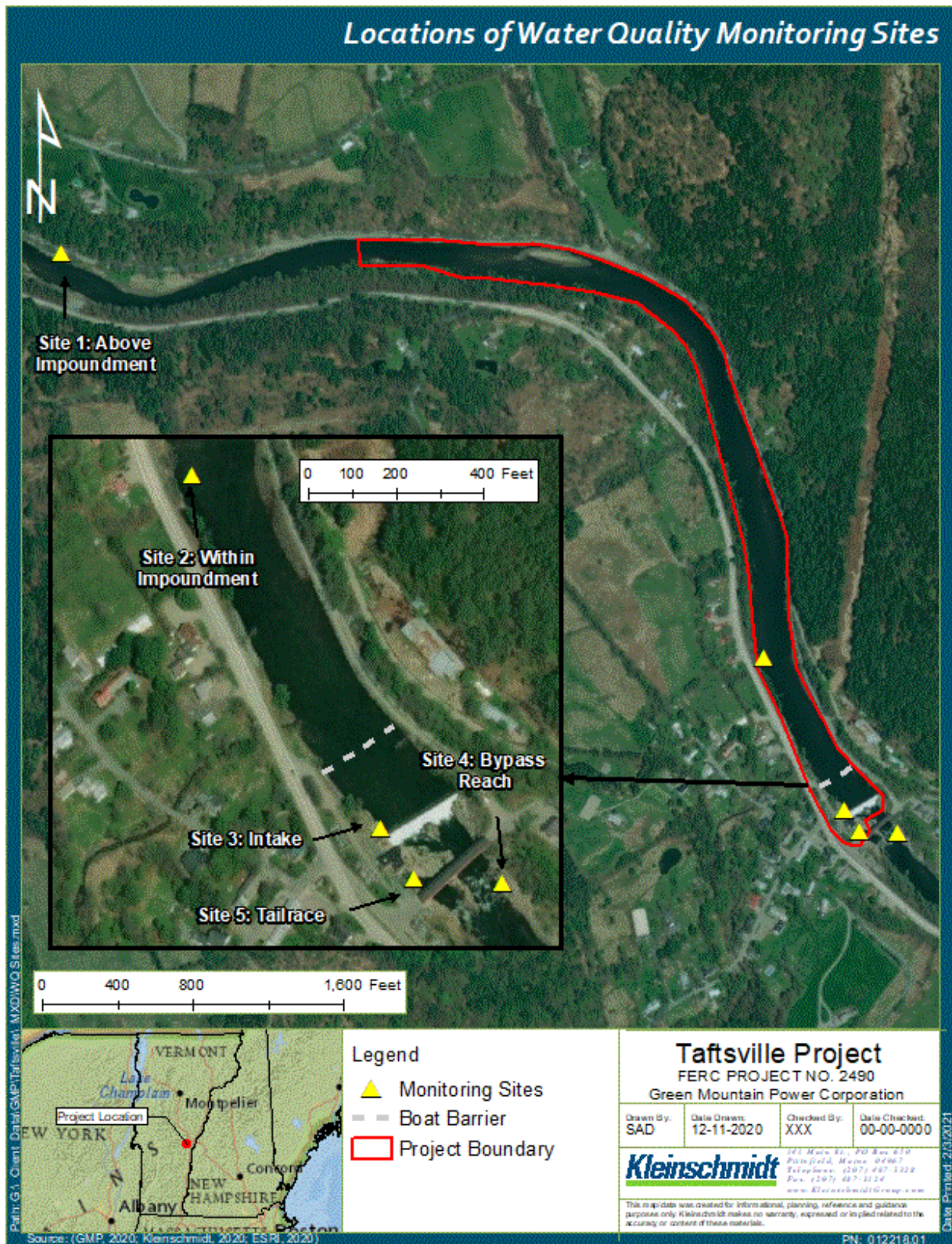


Figure B-1. Water quality monitoring locations (Source: GMP, 2022).



Figure B-2. Bypassed reach [mesohabitats](#) and transect location (GMP, 2023).

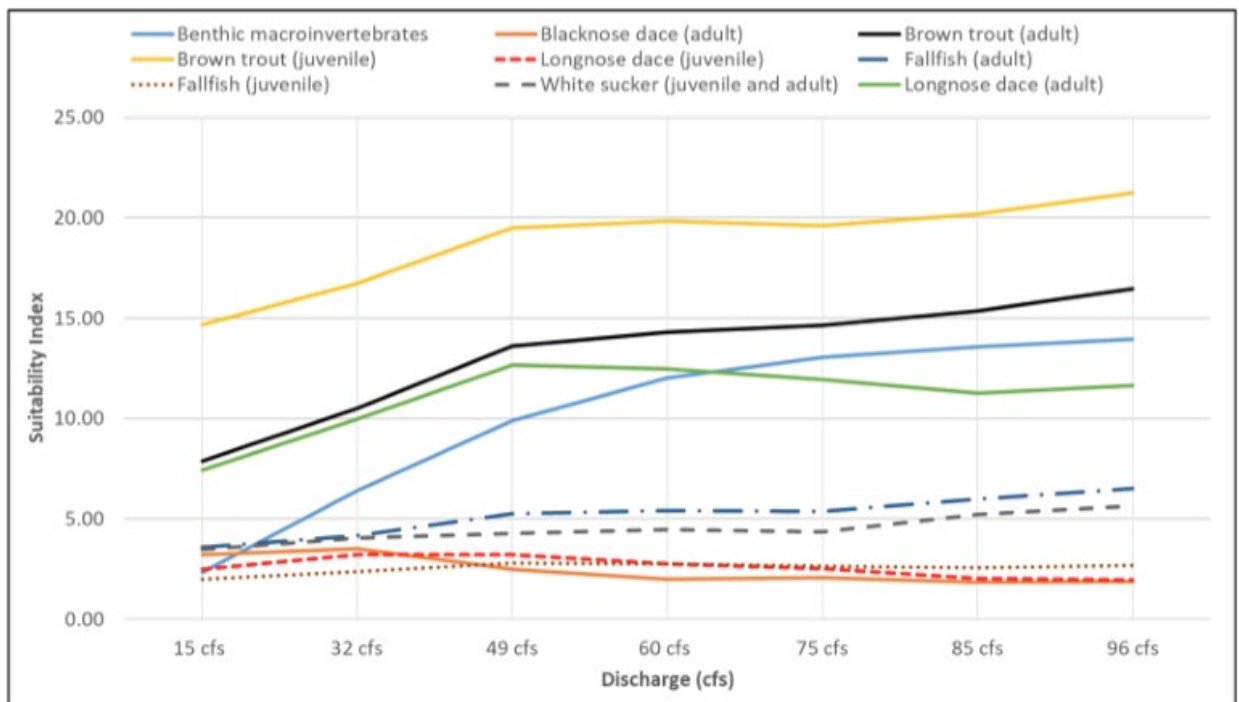


Figure B-3. Change in habitat suitability for target freshwater fish species and benthic macroinvertebrates for evaluated flows (GMP, 2023a).

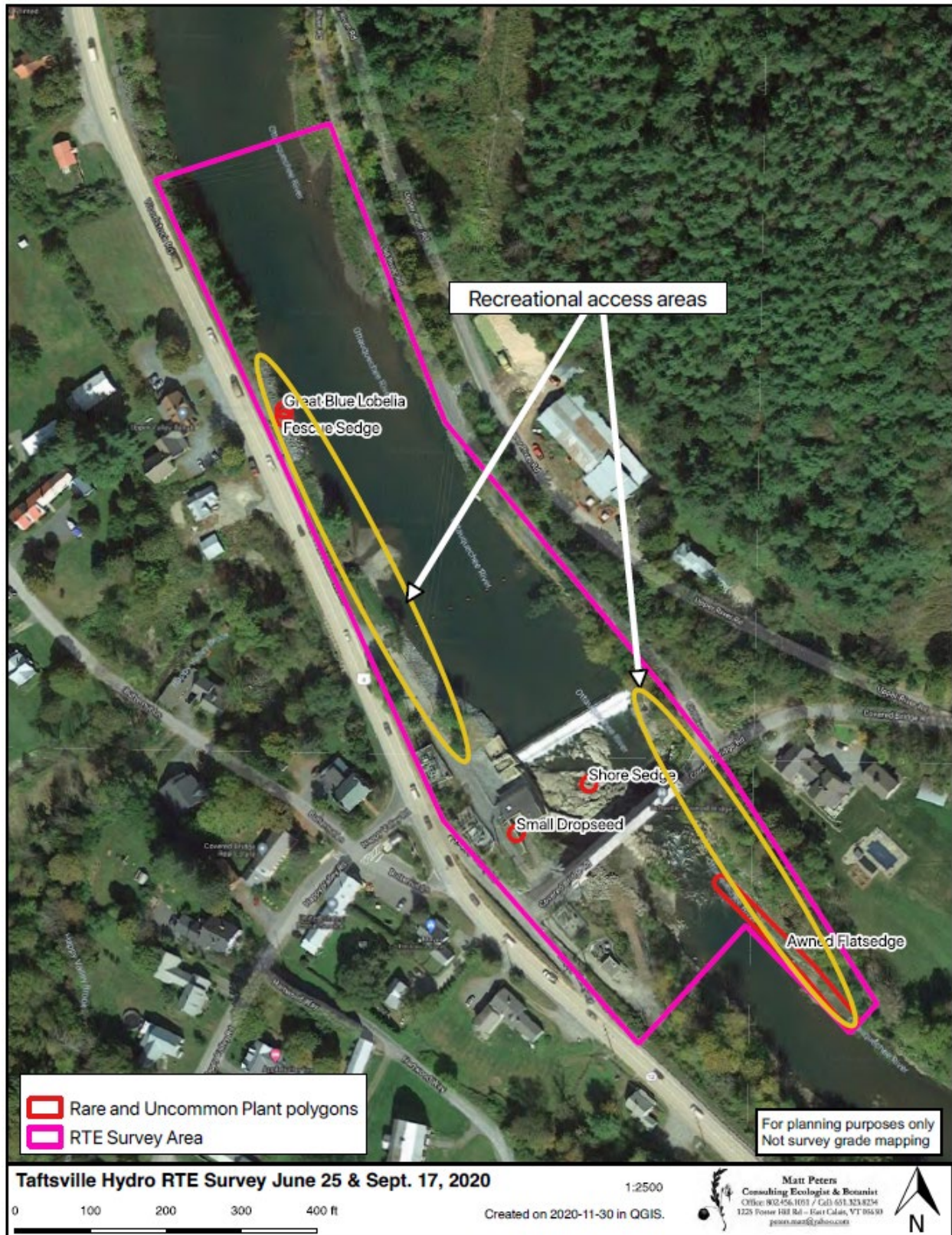


Figure B-4. Special status plant species located in the project boundary (Source: Taftsville Project rare plant survey; Peters, 2020).

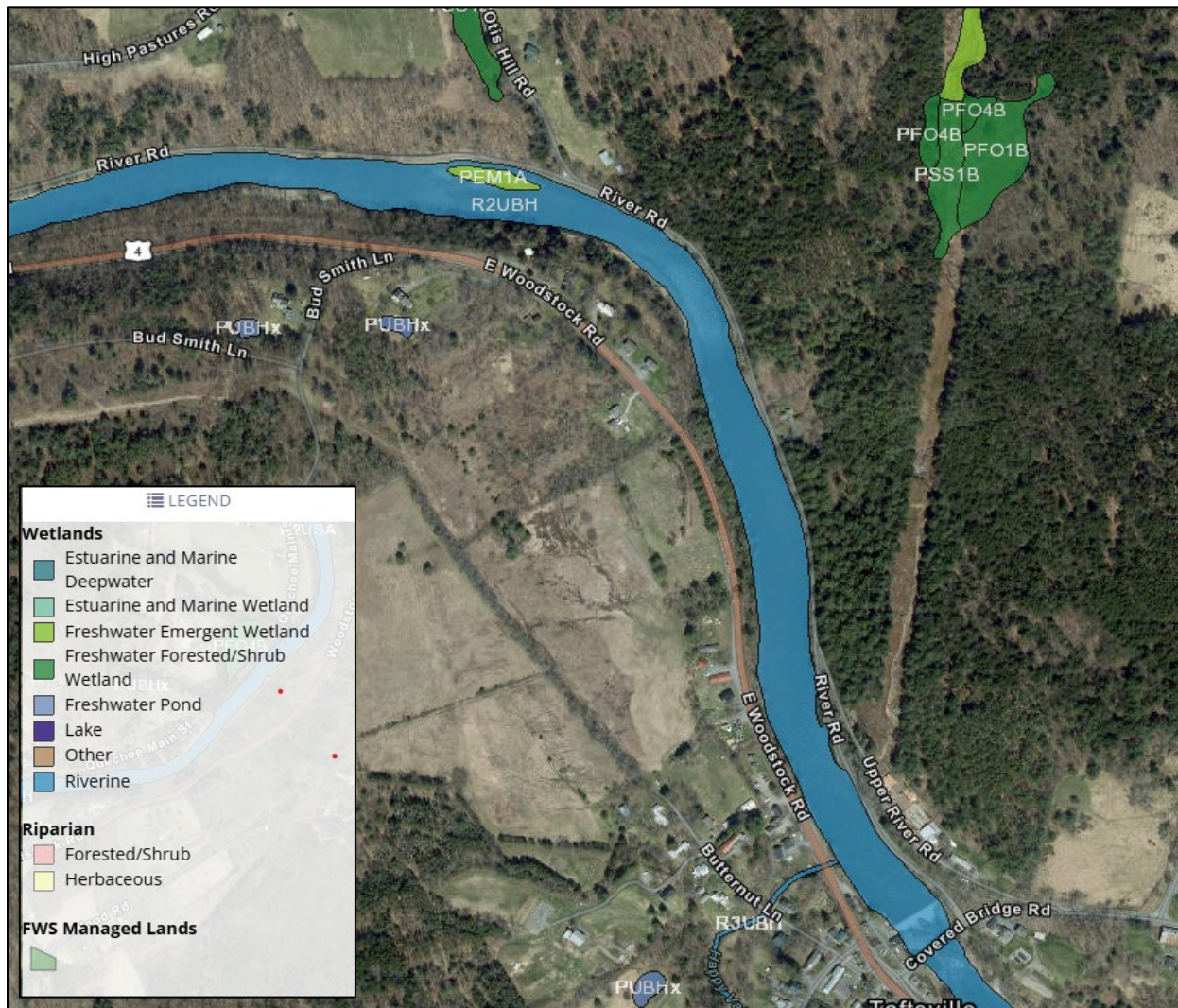


Figure B-5. Wetlands located within vicinity of the Taftsville Project (Source: Fish and Wildlife Service National Wetlands Inventory at: <https://www.fws.gov/program/national-wetlands-inventory>; as modified by Commission Staff). Accessed June 30, 2025.

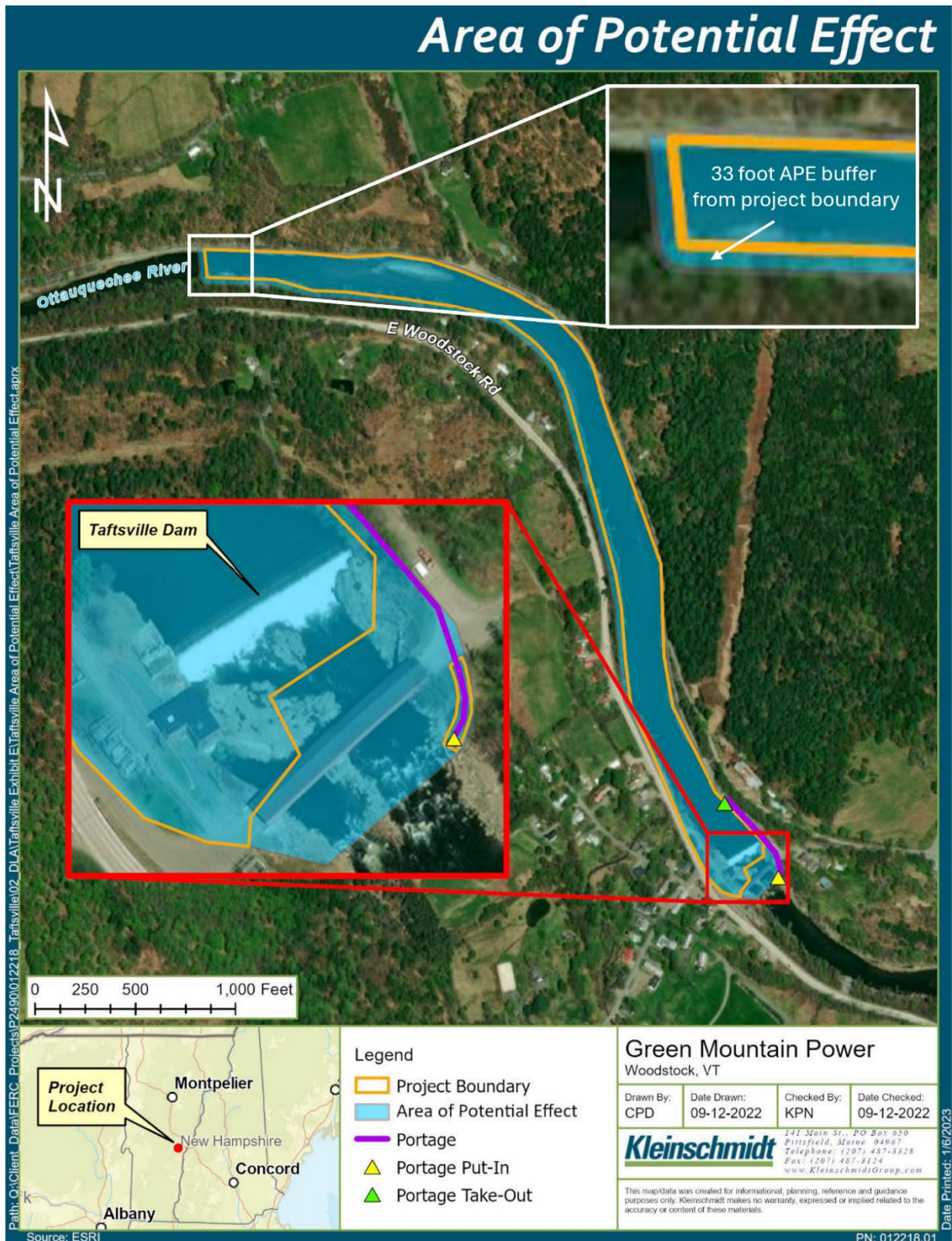


Figure B-6. Proposed Taftsville Project Area of Potential Effects (APE) (Source: GMP; Kleinschmidt; as modified by Commission Staff).

APPENDIX C: TABLES

Table C-1. Monthly flow data (cfs) from 1991-2021 at USGS gage number 01150900
 Ottauquechee River, near West Bridgewater, Vermont (Source: GMP, 2022;
 as modified by Commission Staff).

Month	Flow (cfs)				
	Minimum	90% Exceedance	50% Exceedance (Median)	10% Exceedance	Maximum
January	79	156	282	935	7,794
February	82	132	197	528	5,218
March	98	140	360	1,510	11,979
April	189	425	899	2,779	10,420
May	115	247	546	1,254	8,000
June	40	103	248	831	8,073
July	34	61	154	641	5,571
August	21	44	104	389	3,175
September	13	36	89	261	6,170
October	36	69	198	856	9,928
November	59	150	365	999	5,013
December	82	185	370	963	7,631

Note: USGS gage number 01150900 is missing data from July 12, 2010, to September 31, 2011. The drainage area at the West Bridgewater gage is 192 square miles, while the drainage area at Taftsville Dam is 23.4 square miles. Therefore, in order to provide an estimate of inflow to the project, the flow data were prorated by a factor of 8.205 to reflect the difference in drainage areas between the gage and the project site (i.e., $192/23.4 = 8.205$).

Table C-2. Summary of water quality monitoring results collected from July 23 through August 26, 2020, in the Taftsville Project area and Vermont state standards for cold water fish habitat (Source: GMP, 2024; as modified by Commission Staff).

	Water Temperature (°F) ^a		Dissolved Oxygen (DO) (mg/L) ^a		DO Percent Saturation (%) ^a	
	July	August	July	August	July	August
Site 1: Upstream of the Impoundment						
Minimum	70.3	63.4	5.5	5.9	69.3	70.1
Maximum	85.3	84.4	13.7	14.3	178.5	190.9
Median	76.2	72.0	8.9	8.6	108.4	98.2
Mean	76.5	72.1	9.4	9.0	117.1	106.4
Site 2: Within the Impoundment (deep spot)						
Minimum	72.9	65.3	3.1	2.6	38.4	38.4
Maximum	79.3	77	11.1	10.7	139.3	139.3
Median	76.3	71.5	7.9	6.8	97.7	79.7
Mean	76.1	71.6	7.6	6.7	94.1	78.5
Site 3: Intake						
Minimum	72.6	64.1	4.9	3.4	61.2	41.1
Maximum	78.8	77.9	12.6	11.6	159.3	13.5
Median	76.0	72.4	8.2	7.7	99.8	90.9
Mean	76.1	72.5	8.2	7.8	100.8	91.3
Site 4: Bypassed Reach ^b						
Minimum	73.3	65.3	7.5	7	97	85.8
Maximum	81.3	79.2	8.8	9.6	107.3	107.2
Median	77.4	74.3	8.2	8.2	99.9	99.7
Mean	77.5	73.9	8.2	8.3	99.5	99.0
Site 5: Tailwater ^c						
Minimum	*	64.3	*	4.0	*	43.7
Maximum	*	77.3	*	10.8	*	122.7
Median	*	71.2	*	8.0	*	94.1
Mean	*	70.9	*	8.1	*	94.1

^a Vermont classifies the Ottauquechee River as a Class B2 waterway and designates the river as coldwater fish habitat.⁶³ Class B2 waters are managed for the uses of aquatic biota and wildlife, aquatic habitat, aesthetics, recreation, public water, and irrigation and other agricultural uses. Vermont water quality standards stipulate that, for coldwater fish habitat, (a)

⁶³ Vermont Water Quality Standards, Environmental Protection Rule §29A-306 and §A-03.

the DO concentration may not be less than 6 mg/L or 70% saturation at all times, and (b) the total increase in water temperature due to all discharges and activities shall not exceed 1.0°F. August 12 through August 19 omitted due to an instrument error.

^b August 12 through August 19 omitted due to an instrument error.

^c Study dates in the tailwater were limited to flows high enough to operate the project, which occurred from August 6 through August 26.

Table C-3. Percent change in habitat suitability across a range of flows released from the Taftsville Project impoundment (Source: GMP, 2023a).

Species/Lifestage	Percent of Maximum Suitability						
	15 cfs	32 cfs	49 cfs	60 cfs	75 cfs	85 cfs	96 cfs
Fallfish (adult)	55%	64%	81%	83%	83%	92%	100%
Fallfish (juvenile)	71%	86%	100%	99%	94%	93%	96%
Brown trout (adult)	48%	64%	83%	87%	89%	93%	100%
Longnose dace (adult)	59%	79%	100%	98%	94%	89%	92%
Blacknose dace (adult)	91%	100%	71%	57%	59%	53%	54%
Brown trout (juvenile)	69%	79%	92%	93%	92%	95%	100%
Longnose dace (juvenile)	77%	100%	99%	86%	79%	63%	60%
Benthic macroinvertebrates	17%	46%	71%	86%	94%	97%	100%
White Sucker (adult and juvenile)	61%	72%	76%	79%	77%	92%	100%

Table C-4. Minimum flow into the bypassed reach and available generation flows under existing condition, as well as proposed and recommended minimum flow alternatives (Source: Commission Staff).

Month	Median inflow to Taftsville Dam (cfs)	Existing and proposed condition (110 cfs to operate)		Vermont ANR's recommended 45 cfs minimum bypassed reach flow (140 cfs to operate)	
		Spill flow into bypassed reach (cfs) ^a	Flow available for generation (cfs) ^a	Spill flow into bypassed reach (cfs) ^c	Flow available for generation (cfs) ^c
Jan	282	15	267	45	237
Feb	197	15	182	45	152
Mar	360	15	345	45	315
Apr	899	15	884	45	854
May	546	15	531	45	501
Jun	248	15	233	45	203
Jul	154	15	139	45	109
Aug	104	104	0	104	0
Sep	89	89	0	89	0
Oct	198	15	183	45	153
Nov	365	15	350	45	320
Dec	370	15	355	45	325

^a Under existing and proposed conditions, the powerhouse operates when inflow is at or exceeds 110 cfs (minimum inflow needed to operate GMP's turbine unit [95 cfs] plus a minimum flow of 15 cfs). When inflow is below 110 cfs, the turbine shuts down and all flow is spilled over the dam. When inflow exceeds 385 cfs (maximum hydraulic capacity [370 cfs] plus the minimum flow of 15 cfs), the excess flow is spilled at the dam.

^b Under recommended conditions, the powerhouse operates when flow is at or exceeds 140 cfs (95 cfs to operate the turbine unit plus a minimum flow of 45 cfs). When inflow is below 140 cfs, the turbine shuts down and inflow would be released to the bypassed reach. When inflow exceeds 430 cfs, the maximum hydraulic capacity and recommended minimum flow of 45 cfs would be released to the bypassed reach, either via spill or some other mechanism.

Table C-5. Percent time there is insufficient inflow for the powerhouse to operate under existing and proposed conditions, as well as the recommended minimum flow alternative (Source: Commission Staff).

Minimum Flow + Minimum Hydraulic Capacity (cfs)	Percent of Time Inflow does not Exceed Minimum Flow + Minimum Hydraulic Capacity by Month (i.e., powerhouse is shut down) (%)												Averaged project shut down (%)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
110 (proposed 15 cfs)	3	1	1	0	0	11	36	53	63	25	4	1	17
140 (recommended 45 cfs)	8	17	10	0	1	20	47	65	74	36	8	4	24

Table C-6. Expected burst speeds of adult and juvenile resident fish species found upstream of the Taftsville Project (Source: Commission Staff).

Species	Burst Speed (feet per second)		Source
	Adult	Juvenile	
Rainbow Trout	2.75 to 11.5	3.6 to 5.8	Blank et al., 2020; Froese and Pauley, 2010
Brown Trout	7.0 to 12.7	2.7 to 7.1	Bell, 1991
Longnose Dace	3.8 to 4.4	1.9 to 3.4	Aedo et al., 2009
White Sucker	5.2 to 10.2	1.4 to 2.2	MTO, 2006; Bell, 1991
Smallmouth Bass	3.5 to 5.6	1.5 to 2.1	Peake, 2004; Bell, 1991

Table C-7. Invasive plant species identified in the Taftsville Project boundary (Source: GMP, 2022; Peters, 2020, as modified by Commission Staff).

Species	
Goutweed (<i>Aegopodium podagraria</i>)	Dame's Rocket (<i>Hesperis matronalis</i>)
Garlic Mustard (<i>Alliaria petiolata</i>)	Yellow flag (<i>Iris pseudacorus</i>)
European alder (<i>Alnus glutinosa</i>)	Morrow Honeysuckle (<i>Lonicera morrowii</i>)
Wild chervil (<i>Anthriscus sylvestris</i>)	Purple Loosestrife (<i>Lythrum salicaria</i>)
Japanese barberry (<i>Berberis thunbergii</i>)	Wall lettuce (<i>Mycelis muralis</i>)
Common barberry (<i>Berberis vulgaris</i>)	Watercress (<i>Nasturtium officinale</i>)
Bushy rockcress (<i>Cardamine impatiens</i>)	Parsnip (<i>Pastinaca sativa</i>)
Oriental Bittersweet (<i>Celastrus orbiculatus</i>)	Reed canary grass (<i>Phalaris arundinacea</i>)
Black Swallow-wort (<i>Cynanchum louiseae</i>)	Common Buckthorn (<i>Rhamnus cathartica</i>)
European Spindle-tree (<i>Euonymus europaeus</i>)	Common locust (<i>Robinia pseudo-acacia</i>)
Japanese Knotweed (<i>Fallopia japonica</i>)	Multiflora rose (<i>Rosa multiflora</i>)
Glossy buckthorn (<i>Frangula alnus</i>)	

APPENDIX D: STATUTORY AND REGULATORY REQUIREMENTS

Federal Power Act

Section 18 Fishway Prescriptions

Section 18 of the Federal Power Act (FPA),⁶⁴ states that the Commission is to require the construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of the U.S. Department of Commerce or Interior. On July 18, 2024, the Department of Interior, on behalf of FWS, requested that the Commission include a reservation of authority to prescribe fishways under section 18 in any license issued for the project.

Section 10(j) Recommendations

Under section 10(j) of the FPA,⁶⁵ each hydroelectric license issued by the Commission must include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project. The Commission is required to include these conditions in any subsequent license issued unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency. No entity filed section 10(j) recommendations.

Section 10(a) Recommendations

Under section 10(a) of the FPA,⁶⁶ each hydroelectric license issue by the Commission must be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce; for the improvement and utilization of waterpower development; for the adequate protection, mitigation, and enhancement of fish and wildlife; and for other beneficial public uses, including irrigation, flood control, water supply, recreation, and other purposes.

On August 12, 2024, Vermont ANR filed five recommendations in response to the Commission's notice of application ready for environmental analysis and soliciting comments, recommendations, terms and conditions, and prescriptions for the Taftsville Project, issued on June 12, 2024 (see [Appendix H, Comprehensive Development and Recommended Alternative](#)).⁶⁷ We discuss these five recommendations under section 10(a) to: (1) operate the project in run-of-river mode on a near instantaneous basis; (2) provide a continuous bypass flow of 45 cfs with at

⁶⁴ 16 U.S.C. § 811.

⁶⁵ 16 U.S.C. § 803(j)(1).

⁶⁶ *Id.* § 803(a)(1).

⁶⁷ Vermont ANR did not specify the section of the FPA to which the recommendations apply. Therefore, as is our long-standing practice, we consider the recommendations pursuant to section 10(a) of the FPA.

least 15 cfs spilling over the dam crest; (3) develop a flow management plan; (4) develop a monitoring plan for reservoir and flow management; and (5) consult with Vermont DEC prior to conducting project maintenance or repair work that has the potential to have an adverse effect on water quality.⁶⁸ We discuss these recommendations in [section 5.1., *Comprehensive Development and Recommended Alternative*](#), and in [Appendix H, *Comprehensive Development and Recommended Alternative*](#), of this EA.

Clean Water Act

Under section 401 of the Clean Water Act (CWA),⁶⁹ a license applicant must obtain either a water quality certification (certification) from the appropriate state pollution control agency verifying that any discharge from the project would comply with applicable provisions of the CWA, or a waiver of such certification by the appropriate state agency. The failure to act on a request for certification within a reasonable period of time, not to exceed one year, after receipt of the request constitutes a waiver.

On June 27, 2024, GMP filed a request for a Water Quality Certification pre-filing meeting with the Vermont ANR. On July 31, 2024, the meeting was held to discuss details of the application for the Taftsville Project. On August 9, 2024, GMP filed the project's application for a Water Quality Certification. By letter dated August 12, 2024, Vermont ANR provided acknowledgement that GMP's application was received on August 9, 2024, and that the application was administratively complete.⁷⁰ The deadline for Vermont ANR to act on the request is August 9, 2025. On July 28, 2025, Vermont ANR filed 13 conditions pursuant to section 401 of the CWA.

Endangered Species Act

Section 7 of the Endangered Species Act (ESA),⁷¹ requires federal agencies to ensure their actions are not likely to jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of such species. On June 20, 2025, we accessed the U.S. Fish and Wildlife Service's (FWS) Information Planning and Consultation (IPaC) database to determine whether any federally listed species could occur in the vicinity of the project. According to the IPaC database, the endangered northern long-eared bat (NLEB; *Myotis septentrionalis*) may occur within the Taftsville Project boundary, or be affected by the project.⁷² Additionally, the proposed endangered tricolored bat (*Perimyotis*

⁶⁸ In their August 12, 2024, filing at 2, Vermont ANR defines a true run-of-river project as one which does not operate out of storage. Therefore, it does not artificially regulate streamflow below the project tailrace.

⁶⁹ 33 U.S.C. § 1341(a)(1).

⁷⁰ By letter filed by GMP on August 12, 2024.

⁷¹ 16 U.S.C. § 1536.

⁷² 88 Fed. Reg. 4908-4910 (January 26, 2023).

subflavus)⁷³ and candidate monarch butterfly (*Danaus plexippus*)⁷⁴ may occur within the project boundary or be affected by the project. No designated critical habitats are located within the project boundary.

Our analysis of project effects on NLEB and the tricolored bat is summarized here and presented in full in [Appendix E, Biological Assessment](#), and our recommendations are included in [section 5.1, Comprehensive Development and Recommended Alternative](#), and [Appendix H, Comprehensive Development and Recommended Alternative](#).

No tree removal is anticipated as part of normal project operation or maintenance of the project's recreation facilities. Vegetation management is limited to the area immediately around the project dam and powerhouse and recreation areas. GMP maintains the project's transmission right-of way on a 5- to 7-year cycle for tree removal to ensure safe clearance of the power lines. Restricting trimming and the planned removal of trees to the period between November 1 through March 31 would reduce the likelihood of disturbing NLEB and their newly born pups during the April 1 through October 31 active season. We conclude that relicensing the project, as proposed by GMP, with Commission staff's additional recommended measures, is not likely to adversely affect the NLEB.

Seasonal limits on tree clearing for NLEB would also reduce the likelihood of disturbing tricolored bats during the concurrent pup-rearing season for this species. With the implementation of Commission staff's recommended measures for the NLEB discussed above, we conclude that relicensing the project would not preclude the survival and recovery of, and therefore would not jeopardize, the tricolored bat. Additionally, given that minimal vegetation management would be required at the project, any project effects on monarch butterflies would be localized and insignificant; thus, relicensing the project would not preclude the survival and recovery of, and therefore would not jeopardize the monarch butterfly.

National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA),⁷⁵ requires that a federal agency "take into account" how its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the [National Register of Historic Places](#) (National Register).

Commission staff designated GMP as its non-federal representative for the purposes of conducting section 106 consultation under the NHPA on October 24, 2019. GMP consulted with the Vermont SHPO to identify historic properties, determine the eligibility of cultural resources for listing on the National Register, and assess potential adverse effects on historic properties within the project's APE. To meet the requirements of section 106 of the NHPA, we intend to execute a Programmatic Agreement (PA) with the Vermont SHPO for the protection of historic

⁷³ 87 Fed. Reg. 56,381-56,393 (September 14, 2022).

⁷⁴ 85 Fed. Reg. 81,813 (December 17, 2020).

⁷⁵ 54 U.S.C. § 306108.

properties from the effects of construction, operation, and maintenance of the Taftsville Project. The terms of the PA, including implementing a final Historic Properties Management Plan, would ensure that GMP addresses and treats all historic properties identified within the project's APE.

APPENDIX E: BIOLOGICAL ASSESSMENT

Affected Environment

Northern Long-Eared Bat

The northern long-eared bat (NLEB) was listed as a federally threatened species in 2015 and reclassified as an endangered species, effective March 31, 2023.⁷⁶ Traditional ranges for the NLEB include most of the central and eastern U.S., as well as the southern and central provinces of Canada, coinciding with the greatest abundance of forested areas. The NLEB typically feeds on moths, flies, and other insects in the understory of forested areas. These bats are flexible in selecting roost sites, choosing roost trees that provide cavities and crevices, and trees 3 inches or greater in diameter at breast height (dbh) (FWS, 2014). Human-made structures, such as buildings, barns, bridges, and bat houses can be considered potential summer habitat. However, trees found in highly developed urban areas are unlikely to be suitable NLEB habitat (FWS, 2014).

In Vermont, NLEB are generally active from April through October, and hibernate over the winter season (FWS, 2016; FWS, 2023). Winter hibernation typically occurs in caves and areas around them and can be used for fall-swarming⁷⁷ and spring-staging.⁷⁸ NLEB are most vulnerable to tree removal activities during cool spring months (when bats enter torpor), or if flightless pups or inexperienced flying juveniles are present (FWS, 2022).

The project is located within the white-nose syndrome buffer zone for this species.⁷⁹ Other threats to NLEB include: (1) changes to hibernacula openings that restrict movement or change the microclimate; (2) blasting, drilling, and other noises that disturb bats during hibernation; (3) clearing trees that are used for staging or swarming habitat or as maternity roosts; (4) burning that allows smoke to pass through roost trees (spring through fall) or enter

⁷⁶ Endangered and Threatened Wildlife and Plants; Endangered Species Status for Northern Long-Eared Bat, 87 Fed. Reg. 73,488 (Nov. 30, 2022). On January 25, 2023, FWS delayed the effective date of the final rule reclassifying the northern long-eared bat as endangered from January 30, 2023, to March 31, 2023. Endangered and Threatened Wildlife and Plants; Endangered Species Status for Northern Long-Eared Bat; Delay of Effective Date, 88 Fed. Reg. 4908 (Jan. 26, 2023).

⁷⁷ Fall-swarming fills the time between summer and winter hibernation. The purpose of swarming behavior may include an introduction of juveniles to potential hibernacula, copulation, and gathering at stop-over sites on migratory pathways between summer and winter regions.

⁷⁸ Spring-staging is the time period between winter hibernation and migration to summer habitat. During this time, bats begin to gradually emerge from hibernation and exit the hibernacula to feed but re-enter the same or alternative hibernacula to resume daily bouts of torpor (i.e., a state of mental or physical inactivity).

⁷⁹ White-nose syndrome is a fungal infection that agitates hibernating bats, causing them to rouse prematurely and burn fat supplies. Mortality results from starvation or, in some cases, exposure.

hibernacula during the winter; (5) changes to water resources entering hibernacula or used for drinking or foraging habitat; and (6) exposure to pesticides and herbicides. Although there is no documentation of NLEB at the project, and no known NLEB hibernacula sites occur within 0.25 mile of the project, upland and riparian habitat at the project may provide suitable habitat for NLEB summer roosting and foraging activities. No critical habitat has been designated for this species.

Tricolored Bat

The tricolored bat has been proposed by FWS for listing under the ESA as endangered,⁸⁰ due to the range-wide impacts of white-nose syndrome which have caused estimated declines of more than 90% in affected colonies. The range of tricolored bats includes southeastern Canada, most of Central America, and all, or portions of, 39 states and the District of Columbia, including Vermont.⁸¹ Critical habitat is not being proposed for the species.

The tricolored bat typically forages on small insects including moths, flies, leafhoppers, and beetles in areas over waterways along the forest edge (Missouri Department of Conservation, 2023). Tricolored bats are active from spring to fall, using a combination of summer and winter habitats from mid-March to mid-April and August through October, respectively, and summer habitats from mid-April through July.⁸² The pup-rearing season for tricolored bat occurs from May through July, with pups achieving adult-like flight and foraging ability four weeks after birth. During the summer, tricolored bats primarily roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees, but they have also been observed within artificial roosts (e.g., in barns and under roofs and bridges) and rarely in caves. During the winter, tricolored bats typically hibernate in caves and mines, exhibiting high interannual fidelity to their hibernacula.⁸³

Forest removal or conversion and the disturbance or destruction of caves can result in the loss of suitable summer roosting and foraging habitat, as well as winter hibernacula. The loss or disturbance of habitat may compound the effects of white-nose syndrome. Riparian habitat within the project boundary contains suitable habitat for tricolored bat summer roosting and foraging activities.

⁸⁰ 87 Fed. Reg. 56381 (Sept. 14, 2022).

⁸¹ FWS, *Species Status Assessment Report for the Tricolored Bat (Perimyotis subflavus)*, Version 1.1. December 2021. Hadley, MA., https://www.fws.gov/sites/default/files/documents/Tricolored_Bat_SSA.pdf.

⁸² *Id.*

⁸³ *Id.*

Monarch Butterfly

The monarch butterfly has been proposed by FWS for listing under the ESA as endangered.⁸⁴ Adult monarch butterflies have bright orange wings surrounded by a black border and covered with black veins, and a wingspan of 3.5 to 4 inches. Monarch butterflies migrate thousands of miles across North America in the spring and the fall. In eastern North America, the monarch butterfly migrates between Mexico and Canada over a period of two to three successive generations. In Vermont, the monarch butterfly may be present during the summer months.

Adult monarchs are dependent on diverse sources of food, including milkweed (genus *Asclepias*) and nectar-rich flowers. The monarch butterfly breeding season occurs during the summer when the butterflies lay their eggs on milkweed plants. Reproduction is dependent on the presence of milkweed, the sole source of food for monarch larvae (i.e., caterpillars). Larvae emerge from eggs in 2 to 5 days, and then feed on milkweed over a period of 9 to 18 days. The larva then pupates into a chrysalis, emerging 6 to 14 days later as an adult butterfly. Because of the monarch butterfly larva's dependence on milkweed, loss of milkweed host plants due to herbicide use and habitat loss have been identified as a contributing factor in the decline of the monarch butterfly (FWS, 2021).

The project is located within the range of the monarch butterfly. Although there is no documentation of the monarch butterfly at the project, milkweed plants that provide suitable habitat for monarch butterfly reproduction and foraging could potentially occur within the project boundary.

Environmental Effects

Northern Long-Eared Bat and Tricolored Bat

The continued operation and maintenance of the Taftsville Project could affect NLEB and tricolored bats if they are present within the project area.

GMP proposes to abide by seasonal tree clearing restrictions and only clear trees greater than or equal to 3 inches dbh between November 1 and March 31 for the protection of NLEB. Should tree clearing be required during the time period between April 1 and October 31, GMP proposes to consult with FWS and Vermont ANR regarding removal needs. Vermont ANR recommends, and Vermont ANR's WQC Condition G requires, the seasonal tree clearing restrictions described above for the protection of NLEB. Additionally, in case of a public safety issue or emergency trimming or removal are required during the seasonal protective period, Condition G requires GMP to consult with Vermont DEC as soon as practical after conducting the trimming or removal. No mitigation measures are proposed specifically for the protection of tricolored bats.

⁸⁴ 89 Fed. Reg. 100,662 (Dec. 12, 2024).

Our Analysis

Northern Long-eared Bat

GMP proposes to continue operating the project in a run-of-river mode with the existing minimum bypass flow of 15 cfs, and to continue maintaining existing project recreation facilities including a picnic area, fishing platform, parking and a portage trail. As discussed above, there are no known occupied NLEB hibernacula within 0.25 mile of the project boundary, and there are no known maternity roost trees within 150 feet of the project boundary. However, the limited upland forest in the project vicinity may provide suitable summer roosting habitat for NLEB, and the project impoundment and riparian areas may be used for foraging and travel.

No tree removal is anticipated as part of normal project operation, or maintenance of the project's recreation facilities. Vegetation management is limited to the area immediately around the project dam and powerhouse, as well as recreation areas. GMP maintains the project's transmission right-of way on a 5- to 7-year cycle for tree removal to ensure safe clearance of the power lines.⁸⁵ In the event that tree removal becomes necessary during a subsequent license, GMP's proposal to restrict the clearing of trees greater than or equal to 3 inches dbh to the inactive season (between November 1 and March 31) would help minimize disruption to NLEB. Further, GMP proposes to consult with Vermont ANR and FWS should any tree removal be required during the active season (April 1 through October 31) to help ensure that the project effects on NLEB and their habitats are minimized. However, restricting the removal or trimming of all non-hazardous trees and woody vegetation from April 1 through October 31 would better protect summer swarming, foraging, and travel habitat for NLEB in the project area during the active season.

With the mitigation measures discussed above, we conclude that relicensing the project, as proposed by GMP, with staff's recommended measures and those required by Condition G of the WQC, may affect, but is not likely to adversely affect, the NLEB.⁸⁶

Tricolored bat

As with NLEB, the removal of woody vegetation for maintaining project facilities could affect potential summer roosting and foraging habitat of the tricolored bat. Avoiding the removal or trimming of all non-hazardous trees and woody vegetation from April 1 through October 31 would minimize project effects on tricolored bats, including during the tricolored bat pup season, which generally overlaps with that of NLEB. We conclude that relicensing the Taftsville Project, as proposed by GMP, with staff's recommended measures and those required by Condition G of the WQC, would not preclude the survival and recovery of, and therefore would not jeopardize, the tricolored bat.

⁸⁵ See GMP's March 16, 2023, response to the Commissions Additional Information Requests on the Final License Application filed on December 16, 2022.

⁸⁶ A concurrence letter for the NLEB effects determination was generated using FWS' IPaC system on June 20, 2025, and filed to the record on June 20, 2025.

Monarch Butterfly

GMP manages vegetation around the powerhouse and dam, the project's transmission line right-of-way, and recreation facilities, as noted above. GMP has not proposed any additional ground-disturbing activities.

Our Analysis

No changes to vegetation management at the project are proposed. Maintenance occurs frequently throughout the growing season, such that milkweed stands are not likely to become established for monarch butterfly reproduction or foraging in the affected area around the project facilities. Because there is minimal upland habitat in the project boundary and there is minimal vegetation management required at the project, any project effects on monarch butterflies would be localized and insignificant. We conclude that relicensing the Taftsville Project, as proposed by GMP and required by Condition G of the WQC, with the staff recommended measure described above, would not preclude the survival and recovery of, and therefore would not jeopardize, the monarch butterfly.

APPENDIX F: ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Federal Government Takeover of the Project

In accordance with section 16.14 of the Commission's regulations, a federal department or agency may file a recommendation that the United States exercise its right to take over a hydroelectric power project with a license that is subject to sections 14 and 15 of the Federal Power Act (FPA).⁸⁷ We do not consider federal takeover of the project to be a reasonable alternative. Federal takeover and operation of the project would require congressional approval. While that fact alone would not preclude further consideration of this alternative, there is currently no evidence to indicate that federal takeover should be recommended to Congress. No party has suggested that federal takeover would be appropriate, and no federal agency has expressed an interest in operating the project.

Issuing a Non-Power License

A non-power license is a temporary license that the Commission would terminate when it determines that another governmental agency will assume regulatory authority and supervision over the land and facilities covered by the non-power license. No agency has suggested a willingness or ability to do so. No party has sought a non-power license for the project, and we have no basis for concluding that the project should no longer be used to produce power.

Decommissioning the Project

As the Commission has previously held, decommissioning is not a reasonable alternative to relicensing a project in most cases, when appropriate protection, mitigation, and enhancement measures are available.⁸⁸ The Commission does not speculate about possible decommissioning measures at the time of relicensing, but rather waits until an applicant actually proposes to decommission a project, or there are serious resource concerns that cannot be addressed with appropriate license measures, make decommissioning a reasonable alternative to relicensing.⁸⁹ This is consistent with NEPA and the Commission's obligation under section 10(a) of the FPA to issue licenses that balance developmental and environmental interests.

⁸⁷ 16 U.S.C. §§ 791(a)-825(r).

⁸⁸ See, e.g., *Eagle Crest Energy Co.*, 153 FERC ¶ 61,058, at P 67 (2015); *Public Utility District No. 1 of Pend Oreille County*, 112 FERC ¶ 61,055, at P 82 (2005); *Midwest Hydro, Inc.*, 111 FERC ¶ 61,327, at PP 35-38 (2005).

⁸⁹ See generally *Project Decommissioning at Relicensing; Policy Statement*, FERC Stats. & Regs., Regulations Preambles (1991-1996), ¶ 31,011 (1994); see also *City of Tacoma, Washington*, 110 FERC ¶ 61,140 (2005) (finding that unless and until the Commission has a specific decommissioning proposal, any further environmental analysis of the effects of project decommissioning would be both premature and speculative).

Project decommissioning could be accomplished with or without dam removal.⁹⁰ Either alternative would involve denial of the relicense application and surrender or termination of the existing license with appropriate conditions. No participant has recommended decommissioning, and we have no basis for recommending it.

⁹⁰ In the event that the Commission denies relicensing a project or a licensee decides to surrender an existing project, the Commission must approve a surrender “upon such conditions with respect to the disposition of such works as may be determined by the Commission.” 18 C.F.R. § 6.2. This can include simply shutting down the power operations, removing all or parts of the project (including the dam), or restoring the site to its pre-project condition.

APPENDIX G: DEVELOPMENTAL RESOURCES

Power and Economic Benefits

Table G-1 summarizes the assumptions and economic information used in the analysis. Most of this information is provided by the applicant in its license application. Some is developed by Commission staff. The values provided by the applicant are typically reasonable for the purposes of our analysis. If they are not, it is noted below. Cost items common to all alternatives include: taxes and insurance; estimated capital investment required for major modifications for relicensing; licensing costs; normal operation and maintenance cost; and Commission fees. All costs are adjusted to December 2024 dollars.

Table G-1. Parameters for economic analysis of the project
(Source: GMP and Commission Staff).

Parameter	Value
Installed Capacity	0.5 MW
Average annual generation	1,038 MWh
Period of analysis	30 years
Local and Federal income tax rate	Included in the Operation and Maintenance (O&M) cost
Insurance rate	Included in the O&M cost
Interest rate	6.5 %
Net Investment ^a	\$852,722
Application cost	\$232,345
Operation and maintenance	\$78,789/year
Estimated Commission fees ^b	\$0/year
Cost of Alternative Power (2024) ^c	
1) Energy cost	\$27.67/MWh
2) Dependable Capacity Cost	\$128.53/kW-year

^a Excludes protection, mitigation, and enhancement measures, operating and maintenance costs, and licensing costs.

^b The Commission collects an annual administration charge for all licensed projects which is based on the authorized installed capacity of the project and amount of federal land occupied by the project.

^c The Cost of Alternative Power is based on the cost of providing the same amount of generation and capacity from a natural gas-fired combined cycle plant, as reported by The U.S. Energy Information Administration (EIA), Annual Energy Outlook 2025, for the Division 1, New England Region. The total cost of alternative power is a combination of energy costs and a cost for dependable capacity.

Comparison of Alternatives

Table G-2 summarizes the installed capacity, annual generation, capacity benefit, alternative source of power's cost, estimated total project cost, and difference between the alternative source of power's cost and total project cost for each of the alternatives considered in this EA: No-Action Alternative, Proposed Action, Staff Alternative, and Staff Alternative with Mandatory Conditions.

Table G-2. Summary of the annual cost of alternative power and annual project cost for the three alternatives for the Taftsville Project (Source: Commission Staff).

	No Action	Applicant's Proposal	Staff Alternative	Staff Alternative with Mandatory Measures
Installed capacity	0.5 MWh	0.5 MW	0.5 MW	0.5 MW
Annual generation	1,038 MWh	1,038 MWh	1,038 MWh	955 MWh ^a
Capacity Benefit ^b	0.4 MW	0.4 MW	0.4 MW	0.37 MW
Current alternative source of power cost ^c	\$80,133	\$80,133	\$80,133	\$73,981
Total annual project cost (2022) ^d	\$163,037	\$164,305	\$165,727	\$226,850
Difference between the cost of alternative power and project cost ^e	(\$82,904)	(\$84,172)	(\$85,594)	(\$152,869) ^f

^a A 45-cfs minimum flow will reduce generation by 83 MWh, or about 8% of current generation. U.S. Energy Information Administration (EIA), Annual Energy Outlook 2025 estimates that a typical U.S. household uses an average of 10.5 MWh of energy per year. Based on this annual energy usage, an annual reduction of 83 MWh of energy is equivalent to the average annual generation of 8 U.S. households.

^b Staff estimated the Capacity Benefit based on the ratio of the mean annual flow available for generation for each of 12 months, and the hydraulic capacity of the project.

^c The alternative source of power cost is based on the Cost of Alternative Power in the New England Region, as identified in table G-1 above.

^d All project costs were adjusted to December 2024 dollars to be consistent with the value of energy which is also in December 2024 dollars.

^e A number in parentheses denotes that the difference between the cost of alternative power and project cost is negative; thus, the project cost is greater than the cost of alternative power.

^f The additional cost of this measure is primarily due to a \$441,725/yr cost for reporting flow data on an instantaneous basis, and \$20,809/yr cost for a water quality study as required in the WQC.

No-Action Alternative

Under the no-action alternative, the project would continue to operate as currently licensed. The project would have a total capacity of 0.5 MW, a capacity benefit of 0.4 MW, and

an average annual generation of 1,038 MWh. The current cost to produce the same amount of energy and provide the same capacity benefit from an alternative source of power is \$80,133/year. The levelized annual cost for the project is about \$163,037. Subtracting the total annual project cost from the alternative source of power's cost, the project costs \$82,904/year more to produce power than the cost of alternative power.

Applicant's Proposal

The applicant proposes to continue operating the project as currently licensed. Under the applicant's proposal, the project would have a total capacity of 0.5 MW, a capacity benefit of 0.4 MW, and an average annual generation of 1,038 MWh. The current cost to produce the same amount of energy and provide the same capacity benefit from an alternative source of power is \$80,133/year. The levelized annual cost for the project is about \$164,305. Subtracting the total annual project cost from the alternative source of power's cost, the project costs \$84,172/year more to produce power than the cost of alternative power.

Staff Alternative

Under the Staff Alternative, the project would have a total capacity of 0.5 MW, a capacity benefit of 0.4 MW, and an average annual generation of 1,038 MWh. The current cost to produce the same amount of energy and provide the same capacity benefit from an alternative source of power is \$80,133/year. The levelized annual cost for the project is about \$165,727. Subtracting the total annual project cost from the alternative source of power's cost, the project costs \$85,594/year more to produce power than the cost of alternative power.

Staff Alternative with Mandatory Conditions

Under this alternative, the project would have a total capacity of 0.5 MW, a capacity benefit of 0.37 MW, and an average annual generation of 955 MWh. The current cost to produce the same amount of energy and provide the same capacity benefit from an alternative source of power is \$73,981/year. The levelized annual cost for the project is about \$226,850. Subtracting the total annual project cost from the alternative source of power's cost, the project costs \$152,869/year more to produce power than the cost of alternative power.

Cost of Environmental Measures

Table G-3 presents the cost of each environmental enhancement measure considered in our analysis for the project. All costs are in December 2024 dollars. We convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.

Table G-3. Cost of environmental mitigation and enhancement measures considered in assessing the environmental effects of the Taftsville Project (Source: GMP, 2021; GMP, 2022a; GMP, 2023; and Commission Staff).

Enhancement/Mitigation Measures	Entity	Capital cost (\$) (2024)	Annual Cost (\$/year) (2024)	Levelized Annual Cost (\$/year) (2024) ^a
Operation				
1. Continue operating the project in run-of-river mode, where outflow from the project approximates inflow.	GMP, Staff, Vermont ANR ^{b, h}	\$0	\$0	\$0
2a. Develop an operation compliance monitoring plan to document compliance with run-of-river operation, impoundment levels, minimum bypassed reach flows.	Staff	\$12,025	\$501	\$1,422
2b. Develop a flow monitoring plan detailing how the project would operate in run-of-river mode where outflow equals inflow, on a near instantaneous basis, while maintaining 45 cfs over the dam year-round, and include a method for continuous monitoring and reporting of impoundment levels, inflows, minimum flows into the bypassed reach, turbine discharges, and provisions for flow data to be available on a “near real-time basis,” if requested.	Vermont ANR ^{b, h}	\$0	Up to \$60,000 in year 1 ^d	\$41,735
Aquatic Resources				
3a. Continue to release a year-round minimum flow of 15 cfs, or inflow, whichever is less, from the impoundment to the bypassed reach via spillage over the crest of the dam.	GMP, Staff	\$0	\$0	\$0
3b. Release a year-round minimum flow of 45 cfs, or inflow, whichever is less, to the bypassed reach with flow released via spillage over the crest of the dam.	Vermont ANR ^{b, h}	\$0	\$0 ^e	Reduces generation by 83 MWh
4. Continue to remove 18-inch flashboards prior to winter and re-install in late spring	GMP	\$0	\$0	\$0

Enhancement/Mitigation Measures	Entity	Capital cost (\$) (2024)	Annual Cost (\$/year) (2024)	Levelized Annual Cost (\$/year) (2024) ^a
5. Consult with the resource agencies prior to conducting maintenance and repair work to minimize effects on water quality.	GMP, Vermont ANR, ^{b, h} Staff	\$0	\$0	\$0
6. During the first full study season after license issuance, collect water quality data in the project impoundment and tailrace, similar to the study implemented in 2022, and develop a DO compliance and monitoring plan, if needed.	Vermont ANR ^h	\$10,021	\$20,042	\$20,809
7. Implement an impoundment refill procedure following emergency and maintenance drawdowns, whereby 90% of inflow is passed downstream, and the impoundment is refilled with the remaining 10% of inflow to the project.	GMP, Staff	\$0	\$0	\$0
8. Consult with Vermont DEC regarding the timing and duration of periodic maintenance drawdowns of the impoundment and maintain minimum flow requirements to the bypassed reach during any maintenance drawdowns.	GMP, Staff	\$0	\$0	\$0
9. Before replacing the trashrack, consult with the Vermont DEC, the Vermont FWD and other applicable stakeholders, to determine appropriate clear spacing and file the trashrack design with Vermont DEC prior to commencement replacement.	Vermont ANR ^h	\$0	\$0	\$0
10. Develop a plan, within 1 year of American eel upstream passage being installed at the Quechee Mill Project, to provide upstream and downstream American eel passage at the Taftsville Project.	Vermont ANR ^h	\$10,021	\$0	\$767

Enhancement/Mitigation Measures	Entity	Capital cost (\$) (2024)	Annual Cost (\$/year) (2024)	Levelized Annual Cost (\$/year) (2024) ^a
Terrestrial Resources				
11. Avoid all planned, non-emergency tree and vegetation clearing maintenance activities, regardless of diameter at breast height (dbh), from April 1 through October 31 to protect the NLEB and tricolored bat, and consult with Vermont DEC as soon as practical following emergency tree trimming or removal if it occurs during the seasonal protective period. ^f	Staff ^a	\$0	\$0	\$0
12. Avoid non-emergency tree trimming and removal of trees of 3-inch dbh or greater from April 1 through October 31st to avoid any roost disruption of the NLEB. In case of a public safety issue, or emergency trimming or removal are required during the seasonal protective period, consult with the Vermont DEC as soon as practical after conducting the trimming or removal.	GMP, Vermont ANR ^h	\$0	\$0	\$0
Recreation				
13. Continue to operate and maintain the project recreation facilities that consist of a parking area, picnic area, bank fishing area and viewing platform on the west shore of the impoundment, and a canoe portage on the east side of the impoundment.	GMP, Vermont ANR, ^h Staff	N/A	N/A	N/A ⁱ
Cultural Resources				
14. Update the draft Historic Properties Management Plan in consultation with the Vermont SHPO to protect historic properties that are eligible or listed on the National Register of Historical Places.	GMP, Staff	\$10,021 ^g	\$501 ^g	\$1,268

- ^a All costs are in December 2024 dollars to be consistent with the value of energy which is also in 2024 dollars. We convert all costs to equal annual (levelized) costs over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.
- ^b Vermont ANR's letter filed August 12, 2024, providing preliminary terms and conditions for the Taftsville Project.
- ^c Costs related to any required new or upgraded equipment needed for compliance with measure cannot be accurately estimated.
- ^d Cost for installing two new gages capable of real-time flow monitoring and reporting data at 15-minute increments, and up to \$40,000 to maintain the gages each year, thereafter.
- ^e Vermont ANR recommends that GMP increase the minimum flow from 15 cfs to 45 cfs (or inflow, if less). Although there are no incremental capital or annual costs associated with the increased minimum flow, a 45-cfs minimum flow will reduce generation by 83 MWh, or about 8% of current generation. U.S. Energy Information Administration (EIA), Annual Energy Outlook 2025 estimates that a typical U.S. household uses an average of 10.5 MWh of energy per year. Based on this annual energy usage, an annual reduction of 83 MWh of energy is equivalent to the average annual generation of 8 U.S. households.
- ^f Staff's recommendation removes the > 3-inch dbh parameter from GMP's proposed measure and condition G of the WQC to protect northern long-eared and tricolored bats.
- ^g In a letter filed on February 2, 2022, GMP stated that the capital cost to develop a final Historic Properties Management Plan would be \$10,000 and the annual cost would be \$500.
- ^h Water quality certification condition under section 401(a)(1) of the Clean Water Act (CWA), 33 U.S.C. § 1341(a)(1).
- ⁱ This measure is already included in O&M.

APPENDIX H: COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

This appendix discusses the basis for the staff-recommended measures presented in [section 5.1.2, *Additional Measures Recommended by Staff*](#), and the rationale for modifying GMP's proposal. This section also discusses staff's rationale for measures not recommended.

Measures Recommended by Staff

Operation Compliance Monitoring

GMP proposes to continue to use its SCADA monitoring and control system to continuously monitor impoundment levels and adjust the powerhouse flow to maintain the impoundment at the desired elevation. This automated system is capable of logging impoundment water surface elevations and powerhouse flow levels at 15-minute intervals. GMP proposes no other measures to monitor and report compliance with proposed operations. Vermont ANR recommends that: (1) GMP develop a flow management plan to continuously monitor and report impoundment elevations and flow releases at the project (i.e., spill flows, turbine discharge, and inflows); (2) the flow data "be available on a near real-time basis," upon request; and (3) the plan include the turbine rating curve.

Condition C of the WQC requires that GMP develop a flow management and monitoring plan: (1) detailing how the Project will operate in instantaneous run-of-river mode and comply with the conservation flow requirements; (2) a method for continuous monitoring and reporting of flow releases at the project (including minimum and spill flows, turbine discharge, impoundment levels, and inflows); (3) provisions for flow data to "be available on a near real-time basis;" and (4) procedures for reporting deviations from operating requirements to Vermont DEC within 15 days of a deviation.

In [section 3.3.2.2, *Aquatic Resources, Environmental Effects*](#), we found that GMP's existing SCADA system, with impoundment elevation and turbine output monitoring, would be sufficient to monitor compliance with run-of-river operation and minimum flow releases. We also found that Vermont ANR's recommended, and the WQC's required method of monitoring project operation could be used to monitor compliance with run-of-river operation and flow release requirements. However, we concluded that to implement Vermont ANR's plan, GMP would likely need to install and operate at least one new flow gage in the bypassed reach capable of continuously monitoring stream levels, and that to provide the data on a near real-time basis would require use of the internet to transmit the data. We estimate that installing and maintaining one new gage for monitoring bypassed reach flows and making all flow data available via the internet would add \$41,735 in levelized annual costs to the project, compared to continuing to monitor project operation using GMP's current system. Because GMP's existing automated monitoring and control system would achieve the same compliance objectives as Vermont ANR's recommendation, but at a lower cost, we conclude that the benefits of the real-time flow monitoring system recommended by Vermont ANR, and as required by Condition C of the WQC would not be worth the higher costs.

To enable the Commission to track compliance with the operating requirements of any license issued for the project, we recommend a license condition requiring that GMP develop an operation compliance monitoring plan. The plan would include: (1) a detailed description of the methodologies the licensee would use to monitor compliance with the operational requirements of the license (i.e., run-of-river operation, impoundment levels, minimum flows, timing of planned maintenance etc.); (2) a provision to maintain a log of project operation; and (3) a provision to report deviations from operating requirements to the Commission and Vermont ANR. We estimate that the annual levelized cost of developing an operation and compliance monitoring plan with the above provisions would be \$1,422 and conclude that the compliance benefits justify the cost.

Protection of Northern Long-eared and Tricolored Bats

GMP proposes, Vermont ANR recommends, and Condition G of the WQC requires, that GMP only clear trees greater than or equal to 3 inches in diameter at breast height (dbh) between November 1 and March 31 for the protection of northern long-eared bat (NLEB). Should tree clearing be required during the time period between April 1 and October 31, GMP proposes to consult with FWS and Vermont ANR regarding removal needs and strategies.

As discussed in [Appendix E, Biological Assessment](#), the project is located within the white-nose syndrome buffer zone for the NLEB, and upland and riparian habitat at the project may provide suitable habitat for NLEB and tricolored bat summer roosting and foraging activities. While no tree removal is anticipated as part of normal project operation or maintenance, some tree removal might become necessary during the term of a subsequent license issued for the project. Moreover, maintenance of the project's transmission right-of-way could require periodic tree trimming or removal that may affect NLEB and tricolored bat habitat. GMP's proposal and Vermont ANR's recommendation and requirement (WQC Condition G) to restrict tree clearing (greater than or equal to 3 inches dbh) to the inactive season (November 1 through March 31) and consult with FWS and Vermont ANR should tree clearing be necessary during the active season would help minimize disruption to NLEB and ensure that any project effects on NLEB and their habitat are minimal. However, avoiding planned trimming, cutting, manipulation, or removal of all non-hazardous trees and woody vegetation, regardless of dbh, from April 1 through October 31 would also protect NLEB, tricolored bats, and their newly born pups in the project area during the active season at no additional cost. Therefore, we recommend that GMP avoid all planned, non-emergency tree and vegetation clearing maintenance activities, regardless of dbh, from April 1 through October 31, and consult with Vermont DEC as soon as practical following emergency tree trimming or removal if it occurs during the seasonal protective period.

Measures Not Recommended

Minimum Bypassed Reach Flow Releases

Under the current license, GMP releases a minimum flow of 15 cubic feet per second (cfs), or inflow, whichever is less, over the spillway and into the bypassed reach. GMP proposes to continue to provide this flow in the same manner. Vermont ANR recommends, and Condition

B of the WQC requires that GMP release a year-round, continuous minimum flow of 45 cfs, or inflow if less, from the spillway into the bypassed reach.

In [section 3.3.2.2, *Environmental Effects, Minimum Bypassed Reach Flows*](#), the bypassed reach is described as being 290 feet long, which includes a 190-foot-long pool with a bedrock substrate and 100-foot-long low-gradient riffle with a rocky shoreline and large bedrock outcrops. This area provides little, if any, aquatic habitat value. The 190-foot-long pool is not hydraulically connected to the tailrace. Our analysis shows that the current minimum flow of 15 cfs provides: (1) 70% or more of the maximum available habitat for adult blacknose dace, as well as for the juvenile life stages of fallfish, brown trout, and longnose dace; and (2) 17% of the maximum available habitat for benthic macroinvertebrates. In comparison, Vermont ANR's recommended minimum flow of 45 cfs would provide: (1) 90% or more of the maximum available habitat for juvenile brown trout, fallfish and longnose dace, and adult longnose dace; (2) 75% of the maximum available habitat for adult blacknose dace and fallfish, as well as juvenile and adult white sucker; and (3) 65% of the available habitat for benthic macroinvertebrates. However, there would be a modest loss of habitat for adult blacknose dace and juvenile longnose dace with a 45-cfs release. While a flow of 45 cfs would increase available habitat for nearly all the target species and life stages, our analysis showed that the benefits of the higher flow would be marginal. For example, under present conditions, during the low-flow, high-temperature months of July, August, and September, the project is limited in its ability to operate due to low flows in the river. During these periods, all inflow is spilled at the dam to the bypassed reach; the project typically spills 36% (July), 53% (August), and 63% (September) of the time. Moreover, with a 45-cfs minimum flow release, the project would be shut down to varying degrees every month, except April.

Maintaining GMP's existing 15-cfs minimum flow over the dam would maintain annual generation at 1,038 MWh, equivalent to the average annual energy needs for almost 100 U.S. households. Condition B of the WQC requiring a continuous 45-cfs minimum flow to the bypassed reach would reduce annual generation by approximately 8%, or 83 MWh, which is equivalent to the average annual energy needs for 8 U.S. households. The 290-foot-long bypassed reach that would receive this minimum flow includes a 190-foot-long pool with a bedrock substrate, which likely offers limited usable habitat. Therefore, a 45-cfs minimum flow would primarily benefit only a 100-foot-long section of the bypassed reach. This section is characterized by a low-gradient, rocky shoreline, and large bedrock outcrops, which may further reduce the reach's useful aquatic habitat. Staff concludes that the minor, potential improvement in aquatic habitat with this short river section is outweighed by the incremental reduction in generation, which could otherwise provide the annual energy needs for up to 8 U.S. households. Therefore, we do not recommend the 45-cfs flow release. Regardless, 45-cfs minimum flow release will be included in any license issued, as it is a mandatory condition of the WQC.

Water Quality Study

GMP conducted water quality studies in 2020 and 2022 during the project's relicensing process. Condition D of the WQC requires GMP to conduct an additional water quality study in the project impoundment and in the tailrace during low-flow, summer months, using the 2022 study's methodology. This study is required in the first full study season after license issuance.

Additionally, Condition D requires GMP to develop a DO compliance and monitoring plan, if necessary.

While post-licensing water quality monitoring in the impoundment and tailrace is required by the WQC, an additional study may not provide significant additional data regarding the project's effect on water quality in the river. As discussed in [section 3.3.2.2, *Environmental Effects, Water Quality Study*](#), the 2020 and 2022 water quality studies were conducted during high temperature and low-flow conditions and likely captured the worst-case conditions for temperature and flow, which is the primary objective of additional water quality monitoring. However, the 2020 study fell short, according to Vermont ANR, in that the results are limited to when the project was unable to operate during periods of low flow. To address the agency's concern, an additional study was conducted in 2022, which resulted in (a) similar low DO levels in the impoundment, and (b) limited flows through the tailrace. The project operated for 8 hours during the 2022, 10.5-week study.

The additional requirement of Condition B of the WQC, requiring GMP to increase the minimum flow to the bypassed reach from 15 cfs to 45 cfs would likely exacerbate periods of low DO in the tailrace during the low-flow, summer months, due to the lack of connection between the project tailrace and the bypassed reach during non-operational periods. The project currently operates with inflows of at least 110 cfs (95 cfs minimum turbine flow and 15 cfs minimum flow) and shuts down in July and August 36% and 53% of the time, respectively. The increased minimum flow requirement would necessitate minimum inflows of 140 cfs for project operation, resulting in additional shutdowns of 47% in July and 67% in August (*see* table C-6). Despite low-flow years like 2020 and 2022, increasing the bypassed reach flow would not affect the tailrace, which does not receive flows from the bypassed reach and would remain dry during periods when inflows are too low to operate the project. Therefore, we do not recommend that GMP be required to conduct an additional water quality study, as required by Condition D.

Condition D also requires GMP to develop a compliance plan to implement DO enhancement measures (e.g., operational changes, aerating turbine draft tubes, aerating outflows, or some combination thereof). All of these measures have been used at other hydropower projects to increase DO concentrations. Nonetheless, as discussed in [section 3.3.2.2, *Environmental Effects, Water Quality Study*](#), there is little, if any, evidence in the record regarding the potential benefits of these proposed DO enhancement measures for aquatic organism within the impoundment or tailrace. This information would be important, given what can be substantial temporal and spatial variability of DO concentrations that are influenced by factors like flow volume, ambient temperature, atmospheric pressure, and various site-specific chemical, physical, and biological processes. For instance, the 2020 study showed average DO concentrations of 5.1 mg/L in the impoundment and 5.6 mg/L in the tailrace, with minimum DO concentrations of 2.6 mg/L and 4.0 mg/L in the impoundment and tailrace, respectively. To achieve and maintain the 6.0 mg/L DO standard at the project, GMP may need to implement a variety of mitigation strategies. Without a comprehensive project-specific plan outlining these specific enhancement measures, staff are unable to quantify the benefits associated with the WQC's requirement for improving DO concentrations in these areas. Therefore, staff has no basis to recommend Condition D of the WQC.

Impoundment Drawdown Consultation Measures

GMP proposes to continue to conduct two planned annual drawdowns each year to install and remove the 18-inch flashboards, by lowering the impoundment about 18 inches (to an elevation of 637.12 feet). GMP also proposes to consult with Vermont DEC regarding the timing and duration of maintenance drawdowns to protect nearshore terrestrial and aquatic habitat, as well as maintain minimum flows to the bypassed reach to protect riverine aquatic habitat. Lastly, GMP proposes to consult with Vermont DEC prior to conducting project maintenance or repair work that has the potential to adversely affect water quality. Similarly, Vermont ANR recommends that GMP consult with Vermont DEC prior to conducting project maintenance or repair work that could potentially affect water quality, with such work subject to the review and approval of Vermont DEC.

In [section 3.3.2.2, *Aquatic Resources, Environmental Effects*](#), we found that consulting with Vermont DEC prior to conducting a planned drawdown of the impoundment, as recommended by Vermont ANR, would allow the agency to make recommendations to GMP to minimize adverse effects on water quality from such maintenance drawdowns. However, we concluded that obtaining Vermont DEC approval prior to performing planned maintenance activities (e.g., impoundment drawdowns to remove/replace flashboards) could limit GMP's ability to complete needed repairs in a timely fashion. Therefore, we recommend that GMP consult with Vermont DEC prior to conducting a planned drawdown, but do not recommend that GMP be required to potentially develop plan(s) for Vermont DEC's review and approval prior to conducting a maintenance drawdown or completing other maintenance activities at the project.

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