

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Erie Boulevard Hydropower, L.P.

Project No. 7320-042

NOTICE OF AVAILABILITY OF ENVIRONMENTAL ASSESSMENT

(July 30, 2015)

In accordance with the National Environmental Policy Act of 1969 and the Federal Energy Regulatory Commission's regulations, 18 CFR Part 380 (Order No. 486, 52 FR 47897), the Office of Energy Projects has reviewed the application for a new license for the existing 3.35-megawatt (MW) Chasm Hydroelectric Project, located on the Salmon River, near the Town of Malone, in Franklin County, New York. Commission staff prepared an Environmental Assessment (EA) which analyzes the potential environmental effects of the project and concludes that issuing a new license for the project, with appropriate environmental measures, would not constitute a major federal action significantly affecting the quality of the human environment.

A copy of the EA is on file with the Commission and is available for public inspection. The EA may also be viewed on the Commission's website at <http://www.ferc.gov> using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. For assistance, contact FERC Online Support at FERCOnlineSupport@ferc.gov or toll-free at (866) 208-3676, or for TTY, (202) 502-8659.

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For further information, contact John Mudre at (202) 502-8902.

Kimberly D. Bose,
Secretary.

**ENVIRONMENTAL ASSESSMENT
FOR
HYDROPOWER LICENSE**

Chasm Hydroelectric Project

FERC Project No. 7320-042

New York

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

July 2015

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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
APE	area of potential effects
APLIC	Avian Power Line Interaction Committee
cfs	cubic feet per second
Commission or FERC	Federal Energy Regulatory Commission
CZMA	Coastal Zone Management Act
CZM Program	Coastal Zone Management Program
DO	dissolved oxygen
EA	Environmental Assessment
EFH	essential fish habitat
Erie	Erie Boulevard Hydropower, L.P.
ESA	Endangered Species Act
FPA	Federal Power Act
FWS or Service	United States Fish and Wildlife Service
HPMP	Historic Properties Management Plan
GWh	gigawatt-hours
Interior	U.S. Department of the Interior
kW	kilowatt
kWh	kilowatt-hours
MW	megawatt
MWh	megawatt-hours
mg/L	milligrams per liter
National Register	National Register of Historic Places
NERC	North American Electric Reliability Corporation
New York DEC	New York State Department of Environmental Conservation
New York SCORP	New York Statewide Comprehensive Outdoor Recreation Plan
New York SHPO	New York State Historic Preservation Officer
New York Parks	New York State Office of Parks, Recreation, and Historic Preservation
NHPA	National Historic Preservation Act
Park Service	National Park Service
PA	programmatic agreement
RM	river mile
RMP	Recreation Management Plan
SD1	initial scoping document
SD2	revised scoping document
USGS	U.S. Geological Survey
WQC	water quality certification

EXECUTIVE SUMMARY

Proposed Action

On July 1, 2013, Erie Boulevard Hydropower, L.P. (Erie) filed an application for a new license to continue to operate and maintain its 3.35-megawatt (MW) Chasm Hydroelectric Project, located on the Salmon River, near the Town of Malone, in Franklin County, New York. On April 30, 2015, Erie filed a Settlement Agreement modifying some of the proposed environmental measures in its license application.¹ The project does not occupy any federal lands.

Project Description

The 3.35-megawatt (MW) Chasm Project consists of a 201-foot-long dam with seasonal 2-foot-high flashboards surmounting its 100-foot-long spillway section, a 3,355-foot-long penstock from the intake to a powerhouse containing three turbine/generator units, and an 850-foot-long tailrace. The dam retains an impoundment with a surface area of 22 acres at normal full impoundment level, with a gross storage capacity of approximately 74 acre-feet. The estimated annual energy generation of the Chasm Project is approximately 20,847 megawatt-hours (MWh).

Erie currently operates the project in a run-of-river mode, with a maximum impoundment fluctuation of 0.6 foot. Under the existing license, Erie releases a continuous minimum flow into the 4,800-foot-long bypassed reach of 15 cubic feet per second (cfs), but is allowed to release 10 cfs when inflow to the impoundment falls below 85 cfs. The existing license also requires Erie to maintain a base flow below the confluence of the tailrace with the bypassed reach of 70 cfs, or project inflow, whichever is less.

Proposed Facilities and Operation

Erie proposes no new facilities at the project.

Erie proposes changes to the project's impoundment fluctuations and minimum bypassed reach flows, as described below, for the protection of aquatic resources at the project.

¹ The Settlement Agreement was executed among Erie, the U.S. Fish and Wildlife Service, the New York State Department of Environmental Conservation, the Town of Malone, New York, and the New York State Chapter of Trout Unlimited.

Proposed Environmental Measures

Aquatic Resources

- Continue to implement the Sediment Management Plan, filed July 5, 2012 and required by the existing license, to allow controlled release of sediments deposited within the project impoundment.
- Provide a minimum flow to the bypassed reach of 15 cfs from May 1 through October 1, and a flow of 23 cfs from October 2 through April 30, or flow equal to impoundment inflow, whichever is less (section 3.3 of the Settlement Agreement).
- Provide a base flow of 70 cfs, or flow equal to impoundment inflow, whichever is less, in the Salmon River below its confluence with the powerhouse tailrace (section 3.2 of the Settlement Agreement).
- Maintain the impoundment water level within 0.25 foot of the top of the flashboards (or the crest of the spillway if the flashboards are not installed) when river flow is 85 cfs or more and within 0.1 foot of the flashboards or spillway crest when river flow is less than 85 cfs (section 3.1 of the Settlement Agreement).
- Continue to maintain trash racks on the project's intake with 1-inch clear bar spacing to protect fish from entrainment (section 3.4 of the Settlement Agreement).
- Develop and implement a stream flow and water level monitoring plan to verify impoundment water levels, minimum bypassed reach flows, and base flow (section 3.6 of the Settlement Agreement).

Terrestrial Resources

- Implement the Invasive Species Management Plan appended to the Settlement Agreement to prevent the introduction and spread of invasive species during any construction, maintenance, and operational activities (section 3.7 of the Settlement Agreement).

Recreation

- Implement the Recreation Management Plan appended to the Settlement Agreement to: (1) install a footpath at the informal recreation area at the

powerhouse; (2) install signage at the informal recreation area; (3) install signage near the powerhouse identifying restricted areas including the upper bypassed reach, the substation, and the tailrace area; (4) continue to maintain the Chasm Falls Recreational Area as a river access point, but remove existing picnic amenities; (5) provide the Town of Malone a one-time donation of two wooden picnic tables at the William A. King Memorial Park; and (6) install signage at the Chasm dam indicating “No Parking” and directing the public to the upstream New York Department of Environmental Conservation’s Titusville Mountain Access Site (section 3.5 of the Settlement Agreement).

Cultural Resources

- Implement the Historic Properties Management Plan, filed October 14, 2014, to protect cultural resources.

Alternatives Considered

This environmental assessment (EA) considers the following alternatives: (1) Erie’s proposal as reflected in its license application and Settlement Agreement; (2) the staff alternative; and (3) no action.

Under the staff alternative, the project would include all of Erie’s proposed measures and would also include the water quality certification conditions.

Public Involvement and Areas of Concern

Before filing its license application, Erie conducted pre-filing consultation under the traditional licensing process. The intent of the Commission’s pre-filing process is to initiate public involvement early in the project planning process and encourage citizens, governmental entities, tribes, and other interested parties to identify and resolve issues prior to an application being formally filed with the Commission. After the application was filed, we conducted scoping to determine which issues and alternatives should be addressed. We distributed an initial scoping document to interested parties on November 5, 2013. We conducted a site visit on December 5, 2013, and held public scoping meetings in Malone, New York, on December 4 and 5, 2013. Based on discussions during the site visit, oral comments received during the scoping meetings, and written comments filed with the Commission, we issued a revised scoping document on February 19, 2014. On May 16, 2014, we issued a notice that the application was ready for environmental analysis and requested comments, recommendations, terms and conditions, and prescriptions.

The primary issues associated with licensing this project are: (1) sediment transport downstream through the project area; (2) minimum flow releases for the project's bypassed reach; and (3) maintenance of base flow downstream of the project.

Environmental Impacts and Measures of the Staff Alternative

Aquatic Resources

The Chasm Project's watershed contains large amounts of sandy soils that are easily eroded and transported into the Salmon River and subsequently may be trapped in the project's small impoundment. Under certain conditions, large amounts of sediments stored in the impoundment may be mobilized downstream and negatively affect downstream aquatic resources. Implementation of Erie's Sediment Management Plan, which includes provisions for controlled sediment releases and monitoring thereof, would minimize unplanned sediment releases and protect aquatic species and their habitat downstream of the project, while allowing sediment passage through project.

Operation of the project affects flow in the Salmon River, especially in the project's 4,800-foot-long bypassed reach. A minimum bypassed reach flow of 15 cfs, with an increase to 23 cfs during the trout spawning and incubation period (October 2 through April 30) would protect fish and other aquatic resources in the bypassed reach. In addition, maintaining trash racks with 1-inch clear spacing would ensure fish entrainment at the intake would be minimal.

Maintaining the 70-cfs base flow downstream of the project would protect the existing high quality habitat for downstream aquatic resources and minimizing impoundment fluctuations would reduce disruptions in base flow in the event of a powerhouse outage. Further, implementing a streamflow and water level monitoring plan, to be developed in consultation with the agencies, would provide a means for documenting compliance with the required impoundment levels, minimum flows, and base flow.

Terrestrial Resources

Operation of the project requires periodic vegetation management such as mowing the penstock corridor and around the powerhouse; however, most of the habitat in the project area where vegetation management occurs has previously been disturbed, or is currently developed. Much of the existing wildlife and botanical community is tolerant of this disturbance and, therefore, would not be likely to be affected by continued operation of the project.

No invasive plant species were observed during surveys conducted during 2011, and no new disturbance is anticipated at the project that would introduce invasive plant

species in the project area. Erie's Invasive Species Management Plan, appended to the Settlement Agreement, identifies best management practices to be implemented at the project and contains provisions for public education regarding identification and proper disposal of invasive vegetation. Implementation of the plan would minimize the likelihood of invasive species infestation over the term of a new license.

Erie's proposal to reduce impoundment fluctuation due to project operation from 0.6 feet to 0.25 feet at river flows at or above 85 cfs and 0.1 feet below 85 cfs would protect wetland, riparian, and littoral habitat in the project vicinity.

Threatened and Endangered Species

The northern long-eared bat was listed (effective May 4, 2015) as threatened under the Endangered Species Act. The northern long-eared bat has not been observed in the vicinity of the project, but is known or believed to occur in Franklin County. Because Erie proposes no construction, tree removal, or land-disturbing activities at the Chasm Project, issuing a new license for the Chasm Project is not likely to adversely affect the northern long-eared bat, should it occur in the project area. There are no other federally listed threatened or endangered species known or believed to occur in the project area.

Recreation and Land Use

Erie's Recreation Management Plan would provide for continued maintenance of the Chasm Falls Recreation Area as well as formalize the access area near the powerhouse by installing a footpath and signage; additional signage at the powerhouse and the dam would direct fishermen to formal access areas and designate areas with restricted river access.

Cultural Resources

Erie's Historic Properties Management Plan, filed October 14, 2014, would provide protection for known and previously undiscovered cultural and historic resources and give guidance if any discoveries are made during the term of any license issued.

No-action Alternative

Under the no-action alternative, the project would continue to operate as it has in the past. None of the proposed or recommended measures would be implemented and there would be no effects on environmental resources.

Conclusions

Based on our analysis, we recommend licensing the project as recommended by staff.

In section 4.2, *Comparison of Alternatives*, we compare the total project cost of obtaining power from a likely alternative source of power in the region for each of the alternatives identified above. Our analysis shows that during the first year of operation, under Erie's proposal and as recommended by staff, the project power would cost \$91,959 or \$4.53/MWh less than the alternative cost of power.

We chose the staff alternative as the preferred alternative because: (1) the project would provide a dependable source of electrical energy; (2) the 3.35 MW of electrical energy comes from a renewable resource which does not contribute to atmospheric pollution; and (3) the recommended environmental measures would protect water quality, aquatic and terrestrial habitat, recreation, and historic properties.

On the basis of our independent analysis, we conclude that issuing a license for the project, with the environmental measures we recommend, would not be a major federal action significantly affecting the quality of the human environment.

ENVIRONMENTAL ASSESSMENT

Federal Energy Regulatory Commission Office of Energy Projects Division of Hydropower Licensing Washington, D.C.

Chasm Hydroelectric Project Project No. 7320-042 – New York

1.0 INTRODUCTION

1.1 APPLICATION

On July 1, 2013, Erie Boulevard Hydropower, L.P. (Erie or Applicant) filed an application for a new major license for its existing 3.35-megawatt (MW) Chasm Hydroelectric Project (Chasm Project or project). The project is located on the Salmon River, near the Town of Malone, in Franklin County, New York (Figure 1). The project does not occupy any federal lands.

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The purpose of the Chasm Project is to continue to provide a source of hydroelectric power. Therefore, under the provisions of the Federal Power Act (FPA), the Commission must decide whether to issue a license to Erie for the Chasm 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 new license for the Chasm Project would allow Erie to continue to generate electricity at the project for the term of the license, making electric power from a renewable source available to the grid.



Figure 1. Location of Erie's Chasm Project (Source: applicant).

In this EA, we assess the environmental and economic effects of operating and maintaining the project: (a) as proposed by Erie in its license application, as modified by a settlement agreement (Settlement Agreement) filed on April 30, 2015,² (b) alternatives to the proposed action; and (c) no action. We also make recommendations to the Commission on whether to issue a new license, and if so, what conditions should be included in any license issued. The primary issues associated with licensing this project are: (1) sediment transport through the project area; (2) appropriate minimum flow releases for the project's bypassed reach; and (3) maintenance of base flow downstream of the project.

1.2.2 Need for Power

The Chasm Project would provide hydroelectric generation to meet part of New York's power requirements, resource diversity, and capacity needs. The project would have a total installed capacity of 3.35 MW and generate approximately 20,300 megawatt-hours (MWh) of electricity annually.

To assess the need for power, staff looked at the needs in the operating region in which the project is located. Power from the Chasm Project would be used to support demand in the Northeast Power Coordinating Council (NPCC) - New York region of the North American Electric Reliability Corporation (NERC). The NERC annually forecasts electrical supply and demand nationally and regionally for a 10-year period.³ The NERC prepares seasonal and long-term assessments to examine the current and future reliability, adequacy, and security of the North American bulk power system. For these assessments, the bulk power system is divided into 20 assessment areas, both within and across eight regional entity boundaries. According to NERC's 2014 long-term reliability assessment, the total internal demand for the NPCC – New York region is projected to grow at a compound annual growth rate of 0.79 percent for summer and 0.33 percent for winter during the period from 2015 through 2024. Staff concludes that the project's power and contribution to the region's diversified generation mix will help meet a need for power in the region.

² Erie filed the Settlement Agreement on behalf of itself and the U.S. Fish and Wildlife Service, New York State Department of Environmental Conservation, the Town of Malone, and the New York State Council of Trout Unlimited.

³ The NERC is an international regulatory authority established to evaluate and improve reliability of the bulk power system in North America. NERC develops and enforces reliability standards; annually assesses seasonal and long-term (10-year) reliability; monitors the bulk power system through system awareness; and educates, trains, and certifies industry personnel. NERC is the Electric Reliability Organization for North America, subject to oversight by the U.S. Federal Energy Regulatory Commission (FERC) and governmental authorities in Canada (NERC 2014).

1.3 STATUTORY AND REGULATORY REQUIREMENTS

A new license for the Chasm Project would be subject to numerous requirements under the FPA and other applicable statutes. The major regulatory and statutory requirements are summarized in Table 1 and described below.

Table 1. Major statutory and regulatory requirements for the Chasm Project (Source: staff).

Requirement	Applicable Agencies	Status
Section 18 of the FPA (fishway prescriptions)	U.S. Department of the Interior (Interior)	On July, 14, 2014, Interior reserved its authority to prescribe fishways during the course of the license.
Section 10(j) of the FPA	Interior	On July 14, 2014, Interior filed 10 recommendations pursuant to section 10(j). On May 20, 2015, Interior stated that the Settlement Agreement measures superseded all but one of its original recommendations.
Clean Water Act – Water Quality Certification (WQC)	New York DEC	Erie applied for WQC by letter dated May 22, 2014. New York DEC received the application on May 23, 2014. Water Quality Certification was issued on May 19, 2015.
Endangered Species Act (ESA) Consultation	Interior	Not likely to adversely affect the northern long-eared bat. We will request concurrence from the FWS.
Coastal Zone Management Act Consistency	New York State Department of State (New York DOS)	Coastal zone certification is not required by New York DOS, because the project is not located in the coastal zone.
Section 106 of the National Historic Preservation Act	New York State Historic Preservation Officer (New York SHPO)	Erie filed its Historic Properties Management Plan on October 14, 2014.
Magnuson-Stevens Fishery Conservation and Management Act	National Marine Fisheries Service	No Essential Fish Habitat has been designated in the Salmon River.

1.3.1 Federal Power Act

A license for the proposed project is subject to requirements under the FPA and other applicable statutes. The major regulatory and statutory requirements are described below.

1.3.1.1 Section 18 Fishway Prescriptions

Section 18 of the FPA, 16 U.S.C. § 811, 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 Commerce or the Interior. In a letter filed July 14, 2014, Interior requested that a reservation of authority to prescribe fishways under section 18 be included in any license issued for the project.

1.3.1.2 Section 10(j) Recommendations

Under section 10(j) of the FPA, 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 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.

On July 14, 2014, Interior timely filed 10 recommendations under section 10(j). In its comments on the Settlement Agreement, filed May 20, 2015, FWS stated that the measures in the Settlement Agreement supersede its original 10(j) recommendations, with the exception of the original 10(j) recommendation no. 9, which was not reflected in the Settlement Agreement. The current 10(j) recommendations are summarized in table 15, in section 5.3, *Recommendations of Fish and Wildlife Agencies*. In section 5.3, we also discuss how we address the agency recommendations and comply with section 10(j).

1.3.2 Clean Water Act

Under section 401(a) of the Clean Water Act (CWA), a license applicant must obtain certification from the appropriate state pollution control agency verifying compliance with the CWA. By letter dated May 22, 2014,⁴ Erie applied to the New York Department of Environmental Conservation (New York DEC) for a section 401 water

⁴ Erie filed a copy of this correspondence with the Commission on May 23, 2014.

quality certification (WQC) for the Chasm Project. New York DEC received the application on May 23, 2014. On May 19, 2015, New York DEC issued its WQC for the Chasm Project. The WQC comprises Appendix B of this EA.

The WQC includes General Conditions 1 through 7, which are administrative in nature and Items A through D, which are also administrative in nature. Conditions 8 through 14 address project operation. Conditions 9 through 25 address construction and maintenance activities, should they occur.

The WQC conditions relating to project operation largely mirror the terms of the Settlement Agreement and address: base flows (condition no. 8); minimum flow releases to the bypassed reach (no. 9); streamflow and water level monitoring (no.10); daily impoundment fluctuation under normal operation (no. 11); fish protection and passage (no. 12); sediment management (no. 13; not included in Settlement Agreement); and invasive species management (no. 14).

1.3.3 Endangered Species Act

Section 7 of the Endangered Species Act (ESA), 16 U.S.C § 1531, et seq., requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modifications of the critical habitat of such species.

Erie was designated our non-federal representative for section 7 consultation on August 13, 2010, and consulted with the FWS to identify any rare, threatened, or endangered species that may occur in the project vicinity. During Erie's Wetlands Study and other field activities in 2011, no federally listed rare, threatened, or endangered species were observed in the project vicinity. In a letter dated August 28, 2013, FWS stated that there are no federally listed threatened or endangered species found in Franklin County, nor is there any designated critical habitat.⁵

On October 2, 2013, the FWS published a proposal to list the northern long-eared bat (*Myotis septentrionalis*) as endangered throughout its range under the ESA. According to the FWS' Environmental Conservation Online System, the northern long-eared bat is known to or believed to occur in Franklin County, New York. Subsequently, the FWS determined the northern long-eared bat meets the ESA's definition of threatened. On May 4, 2015, the northern long-eared bat's listing as a threatened species under the ESA became effective. Also effective on May 4, 2015 was the FWS' interim 4(d) rule that exempts certain activities, such as minimal tree removal and maintenance of utility right-of-ways, from incidental take restrictions.

⁵ Letter from David Stillwell, Field Supervisor, FWS Cortland Office, filed with Erie's September 16, 2013, Additional Information Request response.

Erie did not conduct surveys for the northern long-eared bat and no entity requested that surveys be conducted. As a result, the presence of northern long-eared bat at the project cannot be ruled out.

Our analyses of the project impacts on threatened and endangered species are presented in section 3.3.3, *Threatened and Endangered Species*. We conclude that because Erie proposes no construction, tree removal, or land-disturbing activities, issuing a new license for the Chasm Project is not likely to adversely affect the northern long-eared bat, should it occur in the project area.

1.3.4 Coastal Zone Management Act

Under section 307(c)(3)(A) of the CZMA, 16 U.S.C. § 1456(3)(A), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZM agency concurs with the license applicant's certification of consistency with the state's CZM program, or the agency's concurrence is conclusively presumed by its failure to act within 6 months of its request of the applicant's certification. The New York DOS is responsible for reviewing projects for consistency within New York's CZM Program.

The project is not located within the state-designated Coastal Management Zone, which includes coastal areas and extends inland along the St. Lawrence River to the west of the project, and the project would not affect New York's coastal resources. Therefore, the project is not subject to New York's coastal zone program review and no consistency certification is needed (see New York State DOS letter dated June 17, 2010, included in appendix A of the license application).

1.3.5 National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966 (NHPA)⁶ and its implementing regulations⁷ requires that every federal agency "take into account" how each of 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).

To meet the requirements of section 106, the Commission intends to execute a Programmatic Agreement (PA) for the protection of historic properties from the effects of

⁶ 54 U.S.C. § 306108. Pub. L. 113-287, Stat. 3188 (2014).

⁷ 36 C.F.R. Part 800 (2012).

the operation of the Chasm Project. Operation of the Chasm Project has the potential to adversely affect the Adirondack Pulp Mill Site, which has been recommended as potentially eligible for inclusion in the National Register. The terms of the PA would ensure that Erie addresses and treats all historic properties identified within the project's area of potential effects (APE) through the finalization of a historic properties management plan (HPMP). Erie's proposal to prepare an HPMP would provide guidelines, policies, and procedures for the development and implementation of measures to avoid, minimize, or mitigate any adverse impacts to the Adirondack Pulp Mill Site as well as other historic and cultural resources.

On December 27, 2013, Erie filed a copy of its draft HPMP with the Commission and the New York State Historic Preservation Office (SHPO). Erie received comments on the draft HPMP from the SHPO on February 6, 2014 and revised the HPMP accordingly. On September 17, 2014, Erie submitted the revised HPMP to the SHPO for its review. On October 14, 2014, Erie filed its final HPMP with the Commission. That filing included a letter, dated September 23, 2014, from the SHPO expressing their concurrence with the measures included in the HPMP.

1.3.6 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to consult with the Secretary of Commerce on all actions that may adversely affect Essential Fish Habitat (EFH). There is no designated EFH in the Salmon River. We conclude the proposed project would not affect EFH.

1.4 PUBLIC REVIEW AND COMMENT

The Commission's regulations (18 CFR 16.8(2013)) require that applicants 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, ESA, the National Historic Preservation Act, and other federal statutes. Pre-filing consultation must be complete and documented according to the Commission's regulations.

1.4.1 Scoping

Before preparing this EA, we conducted scoping to determine which issues and alternatives should be addressed. We issued an initial scoping document (SD1) to interested agencies and others on November 5, 2013. Two scoping meetings were held on December 4 and December 5, 2013 in Malone, New York to obtain oral comments on the project. A court reporter recorded all comments and statements made at the scoping meetings, and these are part of the Commission's public record for the project. In addition to comments received at the scoping meetings, the following entity provided written comments:

<u>Entity</u>	<u>Filing Date</u>
New York State Department of Environmental Conservation (New York DEC)	January 6, 2014

We issued a revised scoping document (SD2), addressing these comments on February 19, 2014.

1.4.2 Interventions

On October 9, 2013, the Commission issued a notice that Erie had filed an application for a new license for the Chasm Project. This notice set December 8, 2013, as the deadline for filing protests and motions to intervene. In response to this notice, the following entity filed a motion to intervene:

<u>Intervenor</u>	<u>Date Filed</u>
Interior	November 4, 2013

1.4.3 Comments on the Application

On May 16, 2014, the Commission issued a notice requesting comments, recommendations, terms and conditions, and prescriptions. The following entities responded:

<u>Commenting Agencies and Other Entities</u>	<u>Date Filed</u>
Interior	July 14, 2014
New York DEC	July 16, 2014
New York State Council of Trout Unlimited	July 16, 2014

Erie filed reply comments on August 22, 2014.

1.5 SETTLEMENT AGREEMENT

On April 30, 2015, Erie, on behalf of itself and the U.S. Fish and Wildlife Service, New York DEC, the Town of Malone, and the New York State Council of Trout Unlimited filed a settlement agreement (Settlement Agreement). Commission staff issued public notice of the Settlement Agreement on May 1, 2015, with due dates for comments and reply comments of May 21 and May 31, 2015, respectively.

The Settlement Agreement resolves among the settling parties various issues associated with issuance of a new license for the project, including impoundment fluctuation, base flows, bypassed reach flows, fish protection and passage, recreational enhancements, stream flow and water level monitoring, and invasive species management. Erie requests that the Commission accept and incorporate the agreed-upon measures into any new license that may be issued for the project. We consider the Settlement Agreement to represent Erie's Proposed Action regarding these issues for the project.

Section 3.0 of the Settlement Agreement describes the seven measures that the settling parties agree should be incorporated in the terms of the new license and is included as appendix A of this EA. The measures can be summarized as follows.

Measure	Description
3.1	Limit normal drawdown of impoundment to 0.25 foot when project inflow is 85 cfs or greater and 0.1 foot when inflows are less than 85 cfs.
3.2	Release a base flow downstream of the project of 70 cfs or project inflow, whichever is less.
3.3	Release a minimum flow to the bypassed reach of 15 cfs from May 1 through October 1, and 23 cfs from October 2 through April 30, or project inflow, whichever is less.
3.4	Maintain trash racks with 1-inch clear spacing on the project intake year-round.
3.5	Implement the Recreation Management Plan appended to the Settlement Agreement.
3.6	Develop and implement a stream flow and water level monitoring plan.
3.7	Implement the Invasive Species Management Plan appended to the Settlement Agreement.

On May 20, 2015, FWS filed comments in support of the Settlement Agreement. No reply comments were filed.

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 existing license, and no new environmental protection, mitigation, or enhancement measures would be implemented. We use this alternative as the baseline environmental condition for comparison with other alternatives.

2.1.1 Existing Project Facilities

Dam and Spillway

The concrete gravity dam at the Chasm Project is composed of a 24.8-foot-high and 100-foot-long spillway section, two non-overflow retaining walls, and an integrated intake. The spillway is a concrete gravity ogee structure with 2-foot-high wooden flashboards. The fixed crest elevation is 1,283.8 feet mean sea level (msl),⁸ and the top of the flashboards is 1,285.8 feet. The flashboards can be tripped by pulling a pin on the left end of the spillway. There is a 5-foot-diameter operable sluice at the right side of the spillway. The centerline of the sluice is at an elevation of 1,262.8 feet. The outlet is operated by a wheel-operated stem hoist on the intake deck.

Intake and Conveyance System

Water for power generation is taken directly from the Chasm impoundment through a 22-foot-long, 30-foot-high reinforced concrete intake, which is equipped with steel trash racks and two screw-stem-hoisted, sliding-steel head gates. The hoists are operated by an electric motor. There is also a manually operated filler valve to fill the penstock.

The 7-foot-inside-diameter welded steel penstock is approximately 3,355 feet in length and extends from the intake to a 6-foot-diameter steel manifold pipeline just upstream of the powerhouse. The pipeline is above ground for the first 100-plus feet downstream of the intake, then buried thereafter. A 10-inch-diameter discharge pipe tapped off the penstock just downstream of the intake provides a minimum flow to the bypassed reach.

Powerhouse

The powerhouse has a concrete substructure and steel and brick superstructure. The dimensions of the powerhouse are 52 feet by 70 feet by 37 feet high. The structure

⁸ Elevations in this document are presented in feet msl unless otherwise noted.

houses three Francis-type generation units. Water is discharged through conical steel draft tubes into the tailrace.

Tailrace

The project's tailrace consists of an excavated earth and rock channel approximately 10 to 20 feet wide and approximately 850 feet long. The tailrace is lined with a course of laid-up stone block on each side leading to a boulder-dominated substrate and littoral zone at the confluence with the bypassed reach. It is approximately 2 to 6 feet deep under generation flows, with a relatively uniform velocity field that is largely dependent on project operation. At its midpoint there is an outfall that directs a spring-fed drainage from across the road through a culvert and into the tailrace.

Bypassed Reach

The bypassed reach of the project is approximately 4,800 feet in length and ranges from approximately 20 to 150 feet in width. Under the existing license, the bypassed reach receives a year-round minimum flow of 15 cfs based on the calculated orifice of the minimum flow pipe. However, when inflows to the project fall below 85 cfs, the license allows Erie to reduce discharge from the Chasm dam to a continuous minimum flow of 10 cfs, or inflow to the impoundment, whichever is less.

Impoundment

The Chasm impoundment has a surface area of 22 acres and a shoreline length of 3.5 miles at the top-of-flashboard elevation of 1,285 feet msl. The impoundment has a gross storage capacity of 74 acre-feet and a usable storage capacity, under the currently-licensed operating range of 0.6 foot, of 13.2 acre-feet. The impoundment has a drainage area of 126 square miles.

Turbines

The powerhouse contains three S. Morgan Smith, 39-inch-diameter, horizontal Francis turbines rated at 1,756 horsepower (HP) (Units No. 1 and 2) and 2,185 HP (Unit No. 3) and 514 rotations per minute (rpm) at a design head of 256 feet. Units 1 and 2 each are rated at 1 MW, and Unit 3 is rated at 1.35 MW. The estimated discharge through the plant at maximum efficiency is approximately 195 cfs, with a maximum hydraulic capacity of 235 cfs.

Generators

Each turbine drives a direct-connected, General Electric, 3-phase, 60-cycle, alternating current (AC), synchronous generator with nameplate ratings of 1.0 MW (Units No. 1 and 2) and 1.35 MW (Unit No. 3). Field excitation is provided by a direct-

connected, General Electric exciter rated at 30 kilowatts (kW), 125 volts, and 240 amperes.

Appurtenances

The turbine-generators are controlled by digital governors rated at 7,000 (Units No. 1 and 2) and 6,700 (Unit No. 3) foot-pounds. System pressure for Unit No. 1, Unit No. 2, and Unit No. 3 are maintained by Woodward digital heads rated at 170 (Units No. 1 and 2) and 200 (Unit No. 3) pounds per square inch (psi). The powerhouse is equipped with one 8-ton overhead crane.

Substation and Transmission Lines

The project's generators are connected via a 74-foot-long transmission line to an associated electrical substation located adjacent to the facility where the project connects to the grid. Due to deregulation of the energy markets in the State of New York, the substation associated with the Chasm Project is owned and operated by National Grid Corporation.

Recreational Facilities

The project includes the following recreational facilities: 1) the Chasm Falls Site Picnic and Fishing Access Area (Chasm Falls Recreation Area); and 2) an informal parking and bypassed reach access area near the powerhouse.

Project Lands

There are no lands of the United States enclosed within the project boundary.

Project Boundary

Erie's proposed project boundary follows the impoundment shoreline at the 1,285.8 elevation contour (i.e., top of the 2-foot-high flashboards). Also, the proposed project boundary would enclose the penstock, powerhouse, transmission line, tailrace, and the Salmon River bypassed reach. We estimate the total area within the project boundary to be 68.5 acres. No federal or tribal lands are present within the project boundary.

2.1.2 Project Safety

The project has been operating for more than 30 years under the existing license and during this time, Commission staff has conducted operational inspections focusing on the 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, the Commission staff would evaluate the continued adequacy of the proposed project facilities under a new license. Special articles would be included in any license issued, as appropriate. Commission staff would continue to inspect the project during the new license term to assure 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.

2.1.3 Existing Project Operation

Article 25 of the existing license requires Erie to maintain the surface of the project's impoundment at an elevation equal to or above 1,285.2 feet when the 2-foot-high flashboards are in place at the Chasm Falls dam, and to maintain the surface of the project's impoundment at an elevation equal to or above 1,283.2 feet when the flashboards are removed. These elevations are 0.6 foot below the top of the flashboards and the spillway crest, respectively. These requirements provide a 0.6-foot operating band for the project and were included in the license to protect fish and wildlife in the Salmon River. Under article 25, impoundment level requirements may be temporarily modified if necessary due to operating emergencies beyond the control of Erie and for short periods upon mutual agreement between Erie and the New York DEC.

2.1.4 Existing Environmental Measures

In addition to the impoundment level measures provided by the existing project operation described above, the existing license provides the following environmental measures.

Bypassed Reach Flows

Article 24 of the existing license requires Erie to discharge from the dam into the bypassed reach a continuous minimum flow of 15 cfs, as measured immediately below the dam. When inflows to the project fall below 85 cfs, the existing license allows Erie to reduce discharge from the Chasm Falls dam to a continuous minimum flow of 10 cfs, or inflow to the impoundment, whichever is less.

Base Flow

Article 24 of the existing license requires Erie to maintain a continuous base flow of 70 cfs in the Salmon River below the confluence with the powerhouse tailrace, or a flow equal to impoundment inflow, whichever is less. Under article 24, the base flow may be temporarily modified if required by operating emergencies beyond the control of Erie, and for short periods upon mutual agreement between Erie and the New York DEC.

2.2 APPLICANT'S PROPOSAL

Erie's proposal for relicensing the Chasm Project is described in its July 1, 2013 license application, as modified by the April 30, 2015 Settlement Agreement. Erie does not propose any new facilities or capacity.

2.2.1 Proposed Project Facilities

Erie proposes no new facilities in association with relicensing of the project.

2.2.2 Proposed Project Operation

Erie proposes to continue to operate the project as it has under the existing license, except for the reduced impoundment fluctuation and increased minimum flow releases described in the following section.

2.2.3 Proposed Environmental Measures

Erie proposes to implement the protection, mitigation, and enhancement (PM&E) measures described in its license application, as modified by the Settlement Agreement. These measures are summarized below.

Aquatic Resources

- Continue to implement the Sediment Management Plan, filed July 5, 2012 and required by the existing license, to allow controlled release of sediments deposited within the project impoundment.
- Provide a minimum flow to the bypassed reach of 15 cubic feet per second (cfs) from May 1 through October 1, and a flow of 23 cfs from October 2 through April 30, or flow equal to impoundment inflow, whichever is less (section 3.3 of the Settlement Agreement).
- Provide a base flow of 70 cfs, or flow equal to impoundment inflow, whichever is less, in the Salmon River below its confluence with the powerhouse tailrace (section 3.2 of the Settlement Agreement).
- Maintain the impoundment water level within 0.25 foot of the top of the flashboards (or spillway crest if the flashboards are not installed) when river flow is 85 cfs or more, and within 0.1 foot of the top of the flashboards or spillway crest when river flow is less than 85 cfs (section 3.1 of the Settlement Agreement).

- Continue to maintain trash racks on the project's intake with 1-inch clear bar spacing to protect fish from entrainment (section 3.4 of the Settlement Agreement).
- Develop and implement a streamflow and water level monitoring plan to verify impoundment water levels, minimum bypassed reach flows, and base flow (section 3.6 of the Settlement Agreement).

Terrestrial Resources

- Implement the Invasive Species Management Plan appended to the Settlement Agreement to prevent the introduction and spread of invasive species during any construction, maintenance, and operational activities (section 3.7 of the Settlement Agreement).

Recreation

- Implement the Recreation Management Plan appended to the Settlement Agreement to: (1) install a footpath at the informal recreation area at the powerhouse; (2) install signage at the informal recreation area; (3) install signage near the powerhouse identifying restricted areas including the upper bypassed reach, the substation, and the tailrace area; (4) continue to maintain the Chasm Falls Recreational Area as a river access point, but remove existing picnic amenities; (5) provide the Town of Malone a one-time donation of two wooden picnic tables at the William A. King Memorial Park; and (6) install signage at the Chasm dam indicating "No Parking" and directing the public to the upstream New York Department of Environmental Conservation's Titusville Mountain Access Site (section 3.5 of the Settlement Agreement).

Cultural Resources

- Implement the HPMP, filed October 14, 2014, to protect cultural resources.

2.2.4 Modifications to Applicants Proposal – Mandatory Conditions

The following mandatory conditions have been provided and are evaluated as part of Erie's proposal.

Section 18 Fishway Prescriptions

In its letter filed July 14, 2014, Interior requested that a reservation of authority to prescribe fishways under section 18 be included in any license issued for the project.

Water Quality Certification Conditions

Conditions nos. 8 through 14 of the WQC (Appendix B) address project operation and are included in Erie's proposed measures (see section 2.2.3). Other WQC measures address construction and maintenance activities, including: agency notifications (no. 16); time-of-year restrictions on instream work (no. 17); maintenance dredging (no. 18); construction drawdown and refilling (no. 20); and erosion and sediment control (no. 22).

2.3 STAFF ALTERNATIVE

Under the staff alternative, the project would include all of Erie's proposed measures (see section 2.2.3) and would also include the WQC conditions.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

We considered several alternatives to the applicant's proposal, but eliminated them from further analysis because they are not reasonable in the circumstances of this case. They are: (1) issuing a non-power license, (2) Federal Government takeover of the project, and (3) project decommissioning.

2.4.1 Issuing a Non-power License

A non-power license is a temporary license the Commission would terminate whenever it determines that another governmental agency is authorized and willing to assume regulatory authority and supervision over the lands and facilities covered by the non-power license. At this time, no governmental agency has suggested a willingness or ability to take over the project. No party has sought a non-power license, and we have no basis for concluding that the Chasm Project should no longer be used to produce power. Thus, we do not consider a non-power license a reasonable alternative to relicensing the project.

2.4.2 Federal Government Takeover of the Project

In accordance with § 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 section 14 of the FPA.⁹ We do not consider federal takeover to be a reasonable alternative. Federal takeover of the project would require congressional approval. While that fact alone would not preclude further consideration of this alternative, there is currently no evidence showing that federal takeover should be recommended to Congress. No party has suggested that

⁹ 16 U.S.C. §§ 791(a)-825(r).

federal takeover would be appropriate, and no federal agency has expressed interest in operating the project.

2.4.3 Project Decommissioning

Decommissioning of the project could be accomplished with or without dam removal. Either alternative would require denying the relicense application and surrender or termination of the existing license with appropriate conditions. There would be significant costs involved with decommissioning the project and/or removing any project facilities. The project provides a viable, safe, and clean renewable source of power to the region. With decommissioning, the project would no longer be authorized to generate power.

No party has suggested project decommissioning would be appropriate in this case, and we have no basis for recommending it. Thus, we do not consider project decommissioning a reasonable alternative to relicensing the project with appropriate environmental enhancement measures.

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 (aquatic resources, recreation, etc.). Under each resource area, historic and existing conditions are first described. 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 mitigation, protection, and enhancement measures, and any potential cumulative effects of the proposed action and alternatives.¹⁰ Staff conclusions and recommendations are discussed in section 5.2, *Comprehensive Development and Recommended Alternative*.

¹⁰ Unless otherwise noted, the sources of our information are Erie's license application filed on July 1, 2013, as modified by Erie's additional information request responses, filed on September 16, 2013 and May 15, 2014, and the Settlement Agreement.

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The Chasm Project is located along the Salmon River in Franklin County, New York (**Figure 2** and **Figure 3**). From its headwaters in the Adirondack Mountains, the Salmon River flows approximately 50 miles northwest to its confluence with the St. Lawrence River near Dundee, Quebec. The Salmon River discharges into the St. Lawrence River approximately 28.8 river miles (RM) downstream from the project and drains an area of approximately 379 square miles, as measured at Fort Covington, New York (Erie 2010). The project has a drainage area of approximately 126 square miles.

The Chasm Project is located in a region that routinely experiences very cold winters and cooler, sunny summers. The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service maintains a monitoring station in Malone, New York (Station No. 304996) approximately 8 miles northwest of the project. The average annual temperature at the Malone Station from 1983 to 2010 was 42.4 degrees Fahrenheit (°F)(Table 2). The annual average maximum and minimum temperatures at the Malone Station were 51.5°F and 33.2°F, respectively. Annual mean total rainfall at Malone over the period from 1983-2010 was 38.91 inches, with the highest levels of precipitation occurring between April and November, annually. Average snowfall during this same period was 97.6 inches, with approximately 95 percent of snowfall occurring between November and March.

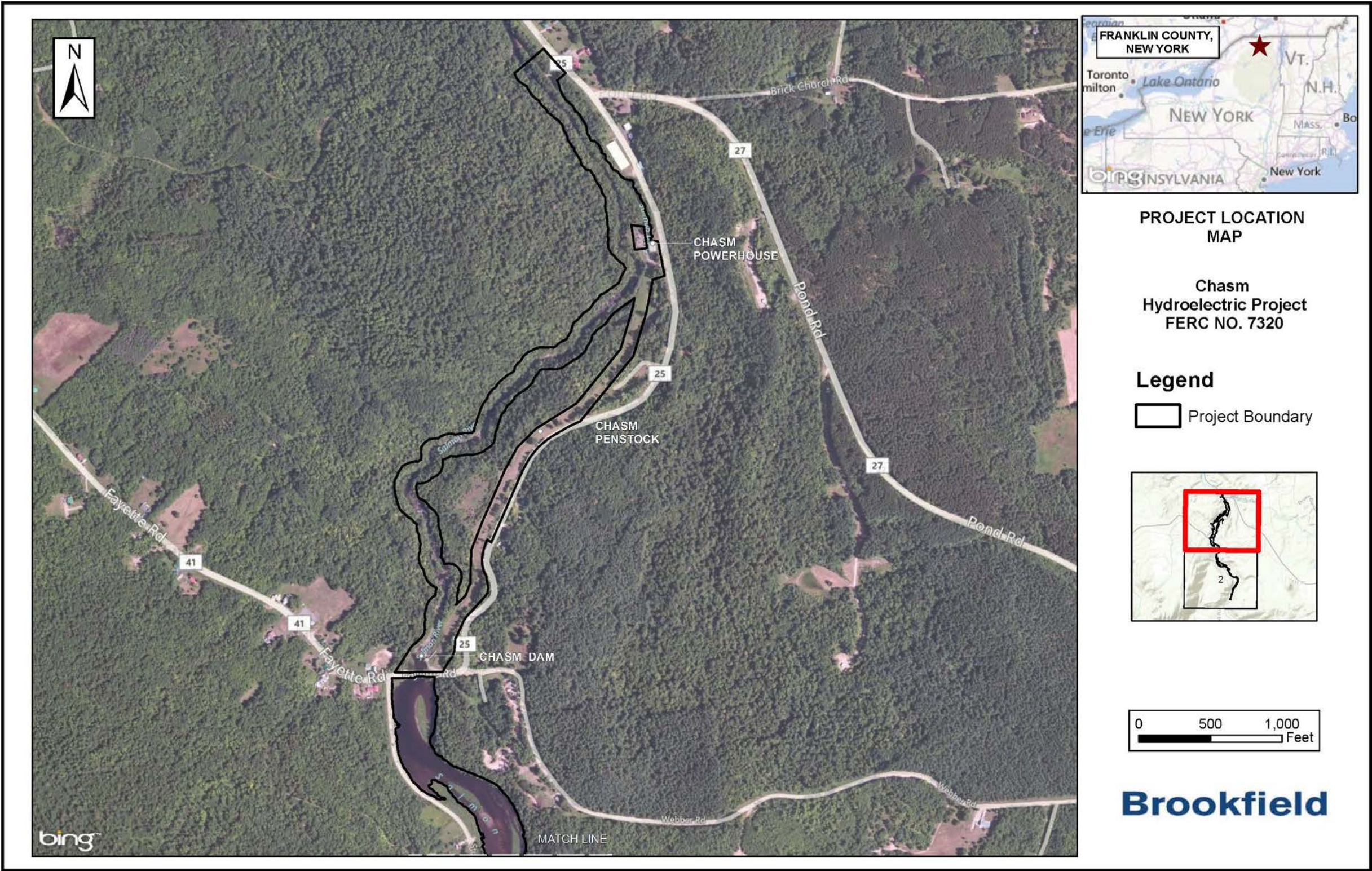


Figure 2. Chasm hydroelectric project boundary and location map: downstream.

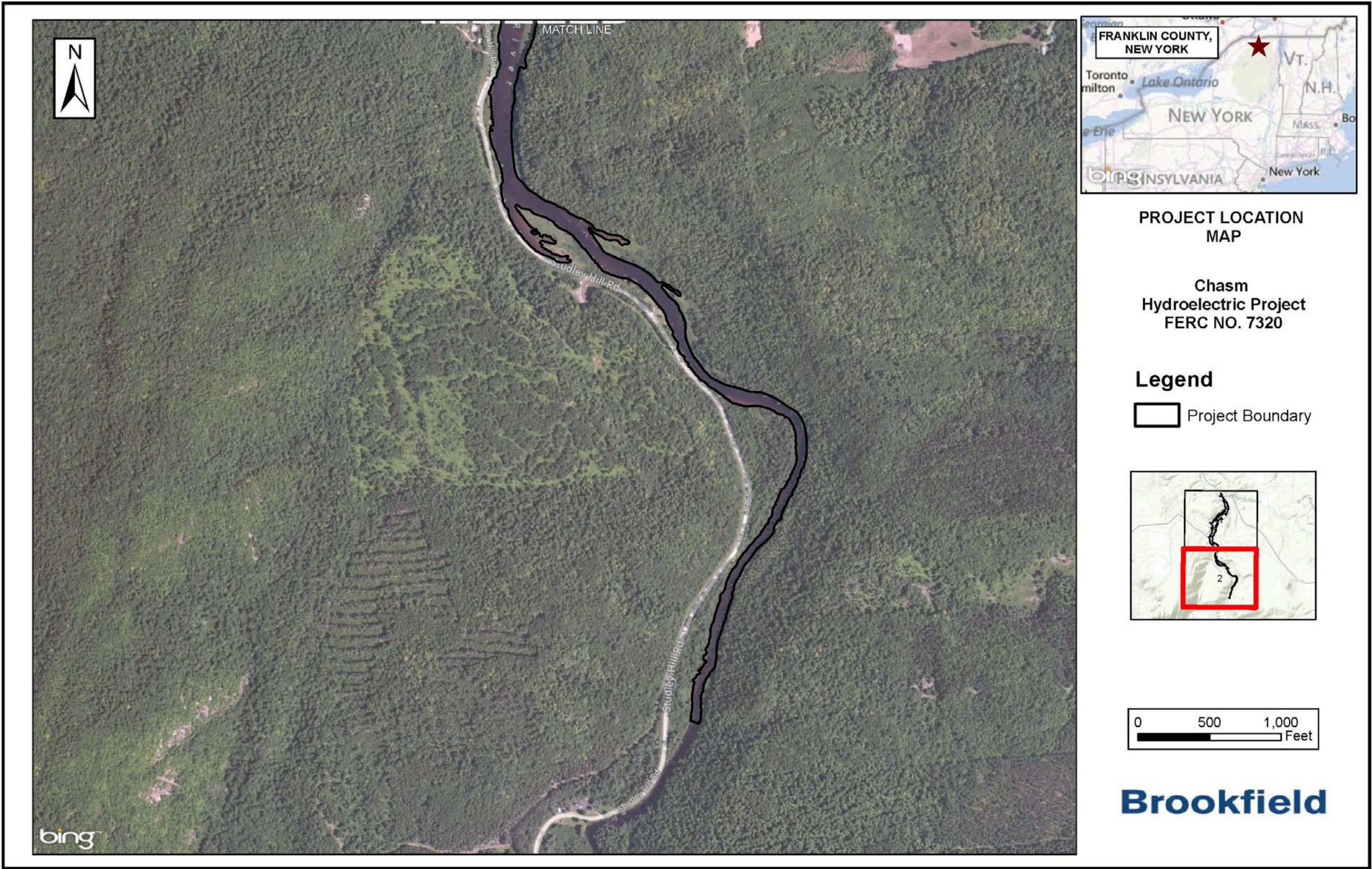


Table 2. Average temperature, precipitation, and snowfall recorded at Malone, NY from 1983 to 2010.

Period	Temperature (°F)	Precipitation (inches)	Snowfall (inches)
January	15.0	2.26	22.8
February	16.8	1.81	19.0
March	26.3	2.21	16.8
April	41.4	2.92	7.1
May	53.6	3.16	0.3
June	63.0	4.04	0.0
July	67.4	4.32	0.0
August	65.4	4.35	0.0
September	57.6	3.84	0.0
October	45.7	4.07	2.0
November	34.8	3.27	9.0
December	21.5	2.67	20.7
Annual	42.4	38.91	97.6

Source: NOAA National Weather Service Forecast Office
(<http://www.weather.gov/climate/xmacis.php?wfo=btv>)

Dams and Diversions in the Salmon River Basin

In addition to the Chasm Project, four other dams are located along the Salmon River. These four dams are also located within Franklin County and are located both upstream and downstream from the project (Table 3). Three of these facilities are operated for hydroelectric generation and have been licensed by the Commission. The fourth dam, Mountain View Dam, is operated for recreation purposes and does not generate electricity. The location of these dams is presented in figure 4.

Table 3. Dams along the Salmon River.

Name	RM	Location	Purpose	Capacity (kW)	FERC Project Number	Owner/Licensee
Macomb	RM 17.3	Village of Malone	Hydroelectric generation	1,000	P-7321	Erie Boulevard Hydropower, L.P.
Whittelsey	RM 19.7	Village of Malone	Hydroelectric generation	420	P-10522	Franklin Hydro, Inc.
Ballard Mill	RM 20.5	Village of Malone	Hydroelectric generation	275	P-3267	North Country Community College Foundation, Inc.
Chasm	RM 28.8	Chasm Falls (Town of Malone)	Hydroelectric generation	3,350	P-7320	Erie Boulevard Hydropower, L.P.
Mountain View	RM 35.8	Mountain View Lake	Recreation	N/A	N/A	Mountain View Association

Tributary Rivers and Streams

The Salmon River is joined by a number of smaller streams and tributaries as it flows from its headwaters in the Adirondack Mountains to its confluence with the St. Lawrence River. Upper watershed tributaries in the northern and western Adirondack foothills that join the Salmon River include Cold Spring Brook (also known as Fishpole Outlet) and the eastern and western branches of Deer Creek (Figure 4). Although there are spring-fed tributaries to the project's bypassed reach, there are no named tributaries that flow into the Salmon River within the project boundary or the project's impoundment.

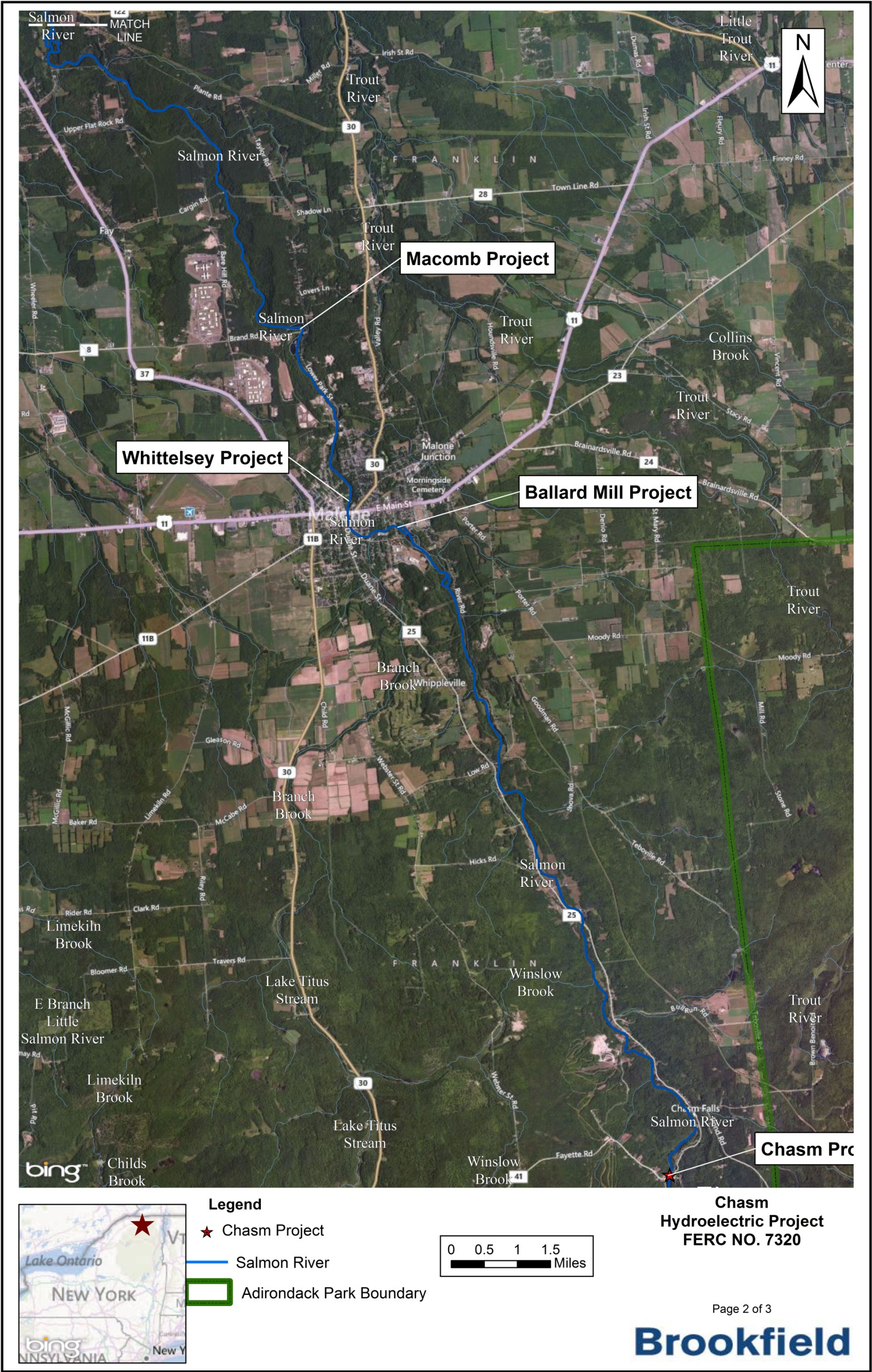


Figure 4. Salmon River tributaries, dams, and diversions.

General Land and Water Use

The headwaters of the Salmon River are located in the Adirondack State Park, a nationally significant wilderness and recreation area. The park encompasses approximately 6 million acres, 2.6 million acres of which are designated the Adirondack Forest Preserve. The Adirondack Forest Preserve includes state lands within the park constitutionally protected to remain “forever wild.” The remaining 3.4 million acres of the park is private land, which includes settlements, farms, timber lands, businesses, homes, and camps. The park is home to approximately 130,000 permanent residents in 105 towns, hamlets, and villages, and host to over 200,000 seasonal homes. These communities provide facilities and services for approximately 9 million visitors each year. Tourism, forestry, agriculture, and mining are the major components of the region’s economy.

The project is located in the Town of Malone, north of and outside of the Adirondack State Park boundary. Land use in the project vicinity is characterized primarily by scattered residences, private recreation areas (e.g., Titus Mountain Ski Center), summer camps, and forested land managed by the New York DEC for forest production and recreation. These New York DEC-managed lands include the Titusville Mountain State Forest, which is located adjacent to the project’s impoundment. Residential and commercial land use in the region is concentrated in and around the Village of Malone, downstream from the project. Crop and pastureland increases downstream from the project as the Salmon River flows through the Village of Malone and into the Upper St. Lawrence River Valley and the St. Lawrence lowlands.

3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

According to the Council on Environmental Quality’s regulations for implementing NEPA (40 CFR, section 1508.7), a cumulative effect is the impact on the environment which 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 impacts can result from individually minor but collectively significant actions taking place over a period of time, including hydropower and other land and water development activities.

Based on our review of the license application and agency and public comments, in SD2 we identified sediment transport and flow-dependent resources downstream of the project as resources that may be cumulatively affected by the proposed operation and maintenance of the Chasm Project.

3.2.1 Geographic Scope

The geographic scope of the analysis defines the physical limits or boundaries of the proposed action's effects on the resources. Because the proposed action would affect the resources differently, the geographic scope for each resource may vary.

The geographic scope for sediment transport would encompass the headwaters of the Salmon River that occur upstream of the project, all waters within the project area, and the main stem Salmon River downstream of the project's dam to its confluence with the St. Lawrence River. We chose this geographic scope because the Chasm Project, along with the downstream Ballard Mill, Whittelsey, and Macomb hydroelectric projects, and the upstream Mountain View Dam, affects sediment movement within the project area and areas downstream of the dam to the river's confluence with the St. Lawrence River.

The geographic scope for flow-dependent resources downstream of the project would include the Salmon River from the Titus Mountain water withdrawal downstream to the Macomb Project (FERC No. 7321). We chose this geographic scope because the impounding and subsequent release of water due to operation of the Macomb Project would attenuate any potential cumulative effects of Chasm Project operation and the water withdrawal.

3.2.2 Temporal Scope

The temporal scope of analysis includes a discussion of the past, present, and reasonably foreseeable future actions and their effects on sediment transport and flow-dependent resources. Based on the term of the proposed license, we will look 30 to 50 years into the future, concentrating on the effects on sediment transport and flow-dependent resources from reasonably foreseeable future actions. The historical discussion is limited, by necessity, to the amount of available information. 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 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 issues.

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 aquatic resources, terrestrial resources, threatened and endangered species, recreation and

land use, aesthetics, and cultural resources may be affected by the proposed action and action alternatives. We present our recommendations in section 5.2, *Comprehensive Development and Recommended Alternative*.

3.3.1 Aquatic Resources

3.3.1.1 Affected Environment

Sediment Transport

Sandy soils dominate the Salmon River Basin and are found in high quantities in the project area as well as upstream and downstream of the project. As the river flows northwest towards its confluence with the St. Lawrence River, the Salmon River entrains sand through soil erosion, sediment input from tributaries, and other natural and anthropogenic sources such as sheet runoff from agricultural and forest lands. This condition has been exacerbated by historic land use practices in the region (e.g., large-scale logging and clear-cutting), which have contributed to the sediment load of the Salmon River. As a result, the bedload of the Salmon River is comprised primarily of sand that originates from the sandy soils in the watershed. Sediment transport occurs primarily during high-flow events and is influenced by the available sediment budget, channel morphology, and downstream barriers to sediment transport.

As a result of the high sediment budget of the Salmon River, the project's impoundment is prone to partial filling by sand transported downstream during high-flow conditions. As the Salmon River enters the impoundment, the reduction in flow velocity causes a reduction in the sediment-carrying capacity of the river. Sandy sediment carried as bed load or suspended load becomes deposited in the lower energy environment of the project's impoundment. Under typical flow conditions, a portion of this sediment will be transported as suspended load through the project's intake and eventually through the turbines and returned to the river in the project's tailrace. Sediment may also move downstream over the project's spillway or through a sluiceway and into the bypassed reach.

In the fall of 1997, during construction to repair the project's spillway, the project's sluice gate was used to assist in maintaining a partial drawdown of the impoundment to allow concrete work on the spillway to proceed. During this time, the New York DEC reported the introduction of large amounts of sediment to the Salmon River downstream of the Chasm dam. Subsequently, the New York DEC conducted sediment surveys and concluded that about 14,000 cubic yards of sediment had passed through the project and was slowly moving downstream.

This construction-related incident identified the need for a sediment management plan at the project. By letter dated December 19, 2001, the Commission directed the

then-licensee to consult with the FWS and the New York DEC and to prepare such a plan. By letter dated September 9, 2005, the Commission required the licensee to operate the project in compliance with an interim sediment management plan until such time that the New York DEC approves a final sediment management plan, which it did on May 25, 2011. The final Sediment Management Plan was filed with the Commission on July 5, 2012 and accepted by the Commission in a letter order dated October 10, 2012.

Water Quantity and Use

The majority of the flows through the Chasm Project are a product of annual spring runoff, which generally occurs during the months of March, April, and May, and precipitation during the wetter fall months from September through December. Approximately 75 percent of the annual flow occurs during these two periods. The months of June through August are generally drier and hotter, while the winter months of January and February are usually very cold with accumulating snowfall. Minimum, mean, and maximum monthly flows at the Chasm Project were calculated using a ratio of the drainage area of the project to the drainage area of the U.S. Geological Survey (USGS) stream gage (Gage No. 04270000), located on the Salmon River at Chasm Falls, downstream from the confluence of the project's bypassed reach and tailrace (Table 4).¹¹ The drainage area upstream of the gage is 132 square miles.

Table 4. Chasm Project hydrologic data (1946-2011).

Month	Minimum (cfs)	90% Exceedance (cfs)	Average (cfs)	10% Exceedance (cfs)	Maximum (cfs)
Annual	43	107	228	389	3,131
January	69	115	193	288	1,747
February	64	111	170	228	1,155
March	79	115	265	508	2,845
April	95	175	506	953	3,131
May	87	162	301	491	1,938
June	53	109	198	294	1,613
July	50	90	160	232	1,136
August	44	88	154	233	1,470
September	43	91	160	237	1,002
October	60	103	204	340	1,556
November	44	123	219	337	1,852
December	78	127	206	305	1,050

¹¹ Gage datum is 1,011.52 National Geodetic Vertical Datum, and the gage is located at 44°45'22" latitude and 74°13'09" longitude.

Existing instream uses of the Salmon River within the project boundary include various recreational activities (e.g., fishing and boating) and hydroelectric generation at the Chasm Project. No additional instream uses of project waters were identified.

Bypassed Reach and Base Flows

As described above in section 2.1.1, the existing license requires Erie to release a minimum flow of 15 cfs in the bypassed reach when inflow to the impoundment is 85 cfs or more and allows for a minimum flow of 10 cfs when inflow to the impoundment is less than 85 cfs. However, Erie has not been reducing bypassed reach flow as allowed in the existing license; instead, Erie voluntarily maintains a minimum 15-cfs flow in the bypassed reach at all times, regardless of inflow to the impoundment. The existing license also requires Erie to maintain a continuous minimum base flow of 70 cfs (or inflow to the impoundment, whichever is less) in the Salmon River below the confluence with the project's tailrace. Erie consistently maintains or exceeds the 70-cfs base flow; however, if all three turbines trip off-line when water level in the impoundment is below the crest of the spillway, then base flow is interrupted until Erie restores flow through the turbines or the impoundment fills and spill over the dam restores the minimum flow in the Salmon River.

Water Withdrawals

No consumptive uses of water occur at the Chasm Project. Water used by the project for hydroelectric generation is immediately discharged back into the Salmon River through the project's tailrace. The Village of Malone obtains its water supply from Cold Spring Brook, a tributary that joins the Salmon River just downstream of the confluence of the project's tailrace and bypassed reach but outside of the project boundary. Cold Spring Brook is fed by a series of intermittent springs located in a small sub-watershed directly east of the Salmon River. A portion of this water supply is held in a 1.0-million-gallon-capacity reservoir near the mouth of Cold Spring Brook. From this reservoir, the water is piped to the larger 2.0-million-gallon-capacity Pinnacle Reservoir in the Village of Malone. In total, the Village of Malone uses an average of 2.5 million gallons of water per day (gpd) from Cold Spring Brook.

The Titus Mountain Ski Center also has a minor water withdrawal located along the west (left) shoreline of the Salmon River, approximately 1 RM downstream from the confluence of the project's bypassed reach and tailrace. This water withdrawal supplies a snowmaking pond for the ski center. Over the period from 2010 – 2012, withdrawals were made from November through February. The maximum permitted withdrawal rate is 2,880,000 gpd, equivalent to 4.456 cfs. Actual withdrawals vary depending on weather and snowmaking needs.

Water Discharges

The Village of Malone is the only entity in the project vicinity possessing a current State Pollution Discharge Elimination System (SPDES) permit to discharge waste water (with permit restrictions) into the Salmon River. This SPDES permit authorizes the village to discharge wastewater from the Village of Malone Wastewater Treatment Plant (WWTP), located approximately 12 RM downstream from the project. The Village of Malone WWTP serves a population of over 6,000 people in the village and more than 5,000 people in three prisons.

Water Quality

Water quality in the Salmon River has generally followed larger regional trends that show increasing improvement following historic impacts. Activities such as logging in the upper watershed and agriculture in the lower watershed of the Salmon River accelerated erosion and impacted water quality. Downstream from the project, industry in Malone and other locations contributed to pollution in the Salmon River watershed.

Despite historic impacts on the water quality of the Salmon River, the river is not currently considered impaired or threatened by the New York DEC. During the last 30 years, the water quality of the Salmon River, as well as other rivers in the Northeast, has improved and the water quality in the project area is considered good.

The Salmon River in the vicinity of the project is managed by the New York DEC as a cold water fishery primarily for brook trout (*Salvelinus fontinalis*) and brown trout (*Salmo trutta*), although warm water species are also found in the river. The New York DEC has classified the portion of the Salmon River extending from Westville Center (a small town downstream of Malone) to the river's source as Class C waters with an accompanying standard of (T) pertaining to trout waters. Fishing is defined as the best usage for Class C waters. Class C waters are suitable for fish, shellfish, wildlife propagation (including trout), and survival, as well as primary and secondary contact recreation. Water quality is a critical component of sustaining a viable and healthy fishery, and maintaining the classification of C(T) for the Salmon River in the project vicinity requires a higher dissolved oxygen (DO) concentration than regular Class C waters as described in Table 5, below.

Table 5. Water quality standards applicable to the Chasm Project.

Stream Segment Description	Classifications and Best Use	Water Quality Parameters
Salmon River from Canadian border to bridge over stream at Westville Center	<p>Classification - C</p> <p>Best Use - The best usage of Class C waters is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.</p>	<p><u>Dissolved Oxygen (DO) for non-trout waters:</u> Minimum DO daily average = 5.0 milligrams per liter (mg/L) Minimum DO = 4.0 mg/L pH: 6.5-8.5 <u>Dissolved Solids:</u> Low as practicable and never exceeding 500 mg/L. <u>Coliforms:</u> The monthly median value and more than 20 percent of the samples, from a minimum of five examinations, shall not exceed 2,400 and 5,000, respectively. <u>Fecal Coliforms:</u> The monthly geometric mean, from a minimum of five examinations, shall not exceed 200.</p>
Salmon River from bridge over stream at Westville Center to source (includes project area)	<p>Classification - C(T)</p> <p>Best Use - The best usage of Class C waters is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.</p>	<p><u>Dissolved Oxygen (DO) for trout waters:</u> Minimum DO daily average = 6.0 mg/L Minimum DO = 5.0 mg/L pH: 6.5 - 8.5 Dissolved Solids: Low as practicable and never exceeding 500 mg/L. <u>Coliforms:</u> The monthly median value and more than 20 percent of the samples, from a minimum of five examinations, shall not exceed 2,400 and 5,000, respectively. <u>Fecal Coliforms:</u> The monthly geometric mean, from a minimum of five examinations, shall not exceed 200.</p>

Water quality in the Salmon River was determined to be non-impacted through macroinvertebrate analysis by the New York DEC in 1997 and 1998. In 1998, hourly stream water temperature data were collected approximately 0.5-mile downstream of the Chasm Project by the New York DEC. A maximum water temperature of 73°F was

recorded in late June and again in late July. Differences in the daily high and low temperatures were 2 to 5 degrees, which is indicative of a stable thermal regime.

Erie conducted a Water Quality Study of the project's impoundment, bypassed reach, tailrace, and downstream reach in 2011 to gather baseline water quality data, including water temperature, DO concentration, DO saturation, pH, and specific conductance. Erie collected continuous water quality data during a typically hot and dry period between July 28 and August 16. In addition, Erie collected discrete water quality data at seven stations in the vicinity of the project throughout the summer. Specific parameters and methods are described in the license application and the final study report filed with the application.

Water Temperature

Based on the water and air temperature data collected by Erie in 2011, seasonal weather patterns appear to be the dominant drivers of water temperature changes in the study area. As shown below in Figure 5, monthly water temperatures from the water quality stations varied with seasonal changes within the vicinity of the project with the exception of Cold Spring Brook, a small and heavily canopied cold water stream that displayed reduced seasonal variation. Consistent with other lakes, reservoirs, and impoundments, the project's impoundment provides a temperature buffering effect with the water warming slightly slower during the spring and cooling slower during the fall.

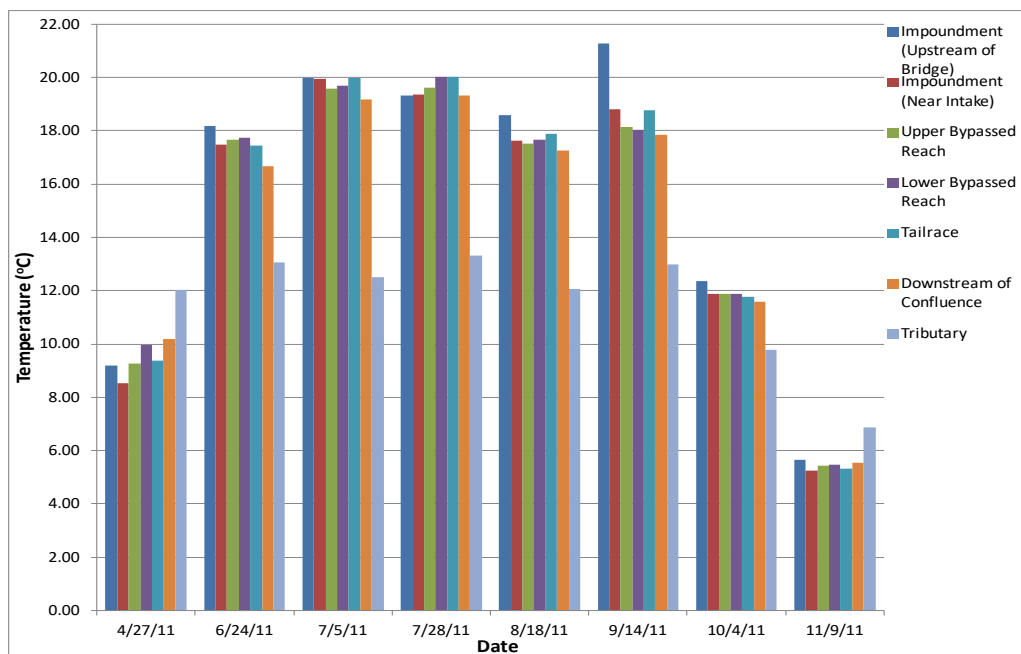


Figure 5. Discrete water temperature data collected at the water quality stations.

Dissolved Oxygen

Seasonal variations in DO concentration observed in 2011 were consistent with the physical relationship between water temperatures and DO concentration. During the warmer summer months, DO concentrations trended lower due to the increased water temperatures. During the fall and spring, cooler water temperatures resulted in higher DO concentrations. On a shorter temporal scale, smaller fluctuations were representative of normal diurnal patterns. DO concentrations remained well above the applicable state water quality standard (6 mg/L) during the 2011 sampling period.

pH

The pH levels observed at the water quality stations in 2011 were generally within the criteria range established by the New York DEC. However, pH levels recorded in the project's impoundment, upper bypassed reach, and tailrace in April 2011, were slightly below the state minimum standard of 6.5. Water bodies in the Adirondack region routinely experience episodic periods of acidification during snowmelt or rainfall runoff events that introduce pulses of lower pH water to the system. Stream and reservoir acidification have been well documented in the region and are the subject of various studies and monitoring activities beyond the scope of this relicensing effort. For example, the Adirondack Lakes Survey Corporation (ALSC) has conducted several studies documenting that large influxes of water with pH values lower than 5.0 routinely occur during snowmelt and precipitation events. Adirondack water bodies, including the Salmon River, which do not possess the buffering capacity to fully neutralize these influxes of lower pH water generally experience episodic acidification on a routine basis (i.e., at least annually) (ALSC 2010). This likely explains the low pH values that were observed at the project.

Continuous Water Quality Monitoring

Approximately 3 weeks of continuous water quality data were collected at 30-minute increments in the Salmon River 0.2 mile downstream of the project's tailrace. Water temperatures ranged from a high of 74.1°F (August 1, 2011 at 6:00 p.m.) to a low of 61.7°F (August 12, 2011 at 8:00 a.m.). DO ranged from a low of 8.15 mg/L at 1:00 a.m. on August 2, 2011 to a high of 9.23 mg/L at 11:00 a.m. on August 13, 2011. These values are well above the New York State minimum DO threshold for Class C(T) waters of 6.0 mg/L (daily average) and 5.0 mg/L (instantaneous). pH values ranged from 7.23 to 7.81 and are within the lower and upper pH standards of 6.5 and 8.5 for Class C(T) waters.

Macroinvertebrate Indicators of Water Quality

Erie also conducted a macroinvertebrate study in 2011, in part to assess the effects of project operation on water quality using New York DEC biotic criteria.

Macroinvertebrates vary in their ability to tolerate environmental stress and, as such, are used to assess water quality.

Erie collected three macroinvertebrate samples in the bypassed reach and the Salmon River downstream of the project's tailrace for a total of six samples to evaluate water quality using the Biological Assessment Profile (BAP). The BAP is a standardized multimetric score that the New York DEC uses to assess water quality. A total of four metrics including species richness; Ephemeroptera, Plecoptera, Trichoptera taxa richness; Hilsenhoff Biotic Index; and Percent Model Affinity¹² are assigned a score from 0 to 10 depending on the type and number of organisms in each sample. A score of 7.5 to 10 for each metric is indicative of high or non-impacted water quality. All samples at both locations scored between 7.5 and 10 for each metric indicating the Salmon River has excellent water quality in the bypassed reach and downstream of the project.

Aquatic Habitat

The Chasm dam was constructed at Chasm Falls, a natural hydraulic barrier that separates the Salmon River into distinct upstream and downstream habitats. The Salmon River upstream from Chasm Falls (including the project's impoundment) has a gradient of approximately 2.75 feet per mile, is slow moving, meandering, and dominated by sandy substrate. Downstream of the Chasm dam, extending most of the length of the bypassed reach, the Salmon River becomes a moderate-to-high-gradient stream with a

¹² Species Richness (SPP) - The total number of species or taxa found in the sample. Higher species richness values are often associated with good water quality conditions.

Ephemeroptera, Plecoptera, Trichoptera Taxa Richness (EPT richness) - The total number of species of mayfly (Ephemeroptera), stonefly (Plecoptera), and caddisfly (Trichoptera) taxa in the subsample. These are considered mostly clean-water organisms and their presence is associated with good water quality.

Hilsenhoff Biotic Index (HBI) - This index is a measure of the tolerance of the organisms in the sample to organic pollution and low DO levels. The presence of intolerant organisms is associated with good water quality.

Percent Model Affinity (PMA) - A measure of the similarity of the sample to a model non-impacted community based on the percent abundance of seven major groups (Novak and Bode 1992).

substrate dominated by bedrock and boulders. The river downstream of the project maintains a lower-gradient, while still providing good trout habitat.

In 2011, Erie conducted a Fisheries Survey to collect a comprehensive baseline for existing fishery resources within the project boundary while targeting brook trout, brown trout, and other game species. As part of this survey, Erie characterized and described the available aquatic habitat in the study area, including the project's impoundment, bypassed reach, and tailrace as well as Cold Spring Brook, a tributary entering the Salmon River just downstream of the project's tailrace. Detailed aquatic habitat descriptions are presented in the final study report.

Impoundment

The Chasm impoundment (Figure 6) has a surface area of approximately 22 acres and a 3.5-mile-long shoreline. Empirical depth measurements during the 2011 Fisheries Survey recorded a maximum depth of approximately 4.0 feet which was reported immediately upstream of the Fayette Road Bridge (County Route 25). The lower impoundment near the Chasm dam is characterized as gently sloped, lacustrine-dominated with substrates of mostly sand and silt and emergent vegetation. Further upstream, the impoundment becomes more riverine with steeper sloped banks and a substrate characterized by sand transitioning to cobble/boulder.



Figure 6. Representative view of Chasm impoundment.

Bypassed Reach

The Chasm bypassed reach is approximately 4,800 feet in length and ranges from approximately 20 to 150 feet in width. General habitat types within the bypassed reach are varied and include riffle, run, pool, braided channel, and cascade/waterfall habitats of varying configurations. Three distinct sub-reaches are present in the bypassed reach: the upper, middle and lower bypassed reaches.

The upper bypassed reach consists of several natural bedrock chutes and cascading waterfalls and is an impediment to upstream fish migration. The substrate of this upper reach is dominated by large boulders and interspersed with smaller boulders and cobbles. Sand is present in some of the interstitial spaces and small pockets of gravel are scattered throughout the upstream portion of this reach. Cover within this reach consists of some overhanging and instream emergent vegetation, canopy cover along the edge, and in-situ cover from the larger boulders, totaling about 15 percent of the river channel. General depths of the upper bypassed reach at a flow of 15 cfs range from approximately 0.0 – 1.0 foot.

The middle bypassed reach is segregated from the upper bypassed reach by a naturally occurring bedrock chute that serves as a barrier to upstream fish migration. The middle bypassed reach consists largely of step runs and pocket water interspersed with short riffles and small pool habitat (Figure 7). This section also has two small side channels identified as riffle habitat. The substrate of this middle reach is dominated by large boulders and interspersed with smaller boulders and cobbles. Sand is also present in some of the interstitial spaces. The side channels contain sand, some silt, and small boulders. Cover within the middle bypassed reach consists of some overhanging vegetation from the canopy at approximately 45 percent with additional, in-situ cover from larger boulders, and some root wads. Maximum depths in this reach at a flow of 15 cfs are approximately 2.6 feet and velocities range from approximately 0.1 foot per second (fps) to 2.0 fps.



Figure 7. Representative view of the middle bypassed reach.

The lower bypassed reach consists largely of riffle/run/pocket water habitat. The substrate is dominated by large to small boulders and cobble, with sand observed in the interstitial spaces. Cover within this reach consists of overhanging vegetation at approximately 85 percent with additional, in-situ cover from the larger boulders and minimally undercut banks. General depths of this reach at an approximate flow of 15 cfs, range from 0.8 foot to 1.1 feet, and velocities range from approximately 0.35 fps to slightly greater than 0.4 fps.

Tailrace

The project's tailrace consists of an excavated channel approximately 10 - 20 feet wide and approximately 850 feet long. The tailrace is approximately 2 to 6 feet deep under generation flows and the sides of the tailrace are lined with large, laid stone block on each side transitioning to boulder-dominated substrate at its confluence with the bypassed reach. The substrate within a majority of the tailrace consists of silt/mud and gravel fines with occasional large cobble, bedrock, and some minimal woody debris.

Cold Spring Brook

Cold Spring Brook enters the Salmon River just downstream of the confluence of the bypassed reach and the tailrace; this small cold water tributary is located outside of the project boundary. The low-gradient downstream reach of Cold Spring Brook is characterized by riffle habitat with a few step pools. The substrate consists of cobble with sand/gravel and small boulders and some woody debris. Depths are generally less than 1 foot and velocities are generally less than 1 fps. The upper reach of Cold Spring Brook is higher gradient and can be characterized as a series of small falls/plunge pools interspersed with short riffle and run segments. The substrate consists of large to small boulders and cobbles, and the interstitial spaces are filled with gravel and sand. Cover within Cold Spring Brook consists of overhanging canopy cover along the edge at approximately 95 percent, undercut banks and scours, debris dams, and pools. Average depth is similar to the lower reach; however, the riffles are shallower, the pools are deeper and the velocities are slightly higher due to the steeper gradient.

Fishery Resources

The lower portion of the Salmon River has historically supported runs of Atlantic salmon and freshwater runs of walleye, muskellunge, and northern pike up to the natural barrier of High Falls in the Town of Malone. This natural barrier prevents the upstream migration of these species as well as American eel and other species that may migrate from the St. Lawrence River.

Brook trout and brown trout are the key sport fish species being managed in the Salmon River. The New York DEC's fishery management goals include sustaining and enhancing all existing viable fisheries resources of the Salmon River, especially for brook trout and brown trout, and to assure that applicable water quality standards and designated uses are achieved and maintained. The Salmon River in Malone Township and immediately downstream in Westville Township are listed by the New York DEC as "Top Fishing Waters" in Franklin County for rainbow and brown trout.¹³

Fish Community

The Salmon River and its 20 major tributaries support a popular fishery with anglers seeking brown, brook, and rainbow (*Oncorhynchus mykiss*) trout. Large trout occur throughout the Salmon River and anglers have caught 5-pound brown trout near RM 16.3 in the Village of Malone. Sport fish populations are abundant throughout the river, in part because of the New York DEC's stocking program. Since 2002, the New York DEC has stocked the approximately 8.3-mile-long reach of the Salmon River extending from the Ballard Mill Project upstream to the Chasm bypassed reach with approximately 89,480 brown trout. Each year the New York DEC stocks approximately

¹³ <http://www.dec.ny.gov/outdoor/38324.html>.

6,000 to 9,000 8- to 10-inch brown trout and 400 to 650, 13- to 15-inch brown trout in this 8.3-mile-long reach. The Salmon River fishery is also supported by naturally reproducing trout and other species. Near Chasm Falls, wild brook trout and brown trout comprise 50 percent of the population, and tributaries like Cold Spring Brook support wild fish populations.

The New York DEC conducted sampling at the downstream end of the Chasm Project's bypassed reach in 1998. Brook and brown trout were abundant and both stocked and wild trout were captured during the survey. Non-game species captured in 1998 also included longnose dace, cutlips minnow, blacknose dace, slimy sculpin, white sucker, and creek chub.

As noted above, Erie conducted a Fisheries Survey in 2011 using boat and backpack electrofishing to sample representative habitats and characterize the fish community in the project vicinity. Erie conducted an early summer fisheries survey of the project's bypassed reach and Cold Spring Brook on July 6 and 7, 2011. In addition, Erie conducted an early fall fisheries survey of the project's impoundment, bypassed reach, tailrace, and Cold Spring Brook between September 12 and 14, 2011. A detailed description of the survey methods and results is presented in the final study report.

A total of 4.76 hours of backpack and 1.4 hours of boat electrofishing combined for a total of 6.16 hours of electrofishing and produced a total catch of 1,014 fish of 15 species during the two sampling events in 2011. Table 6 and Table 7 provide data on fish species and numbers collected by sample area. Species composition reflected habitat type with major differences between the impoundment and riverine habitats. White sucker was the most abundant fish collected and was primarily collected in the impoundment. The impoundment also contained a few smallmouth bass and yellow perch. River habitat reaches were dominated by several cyprinid species (fallfish, cutlips minnow, and longnose dace) followed by salmonids (brook trout and brown trout). Cyprinids were the most diverse, represented by six species. In total, white sucker was the most abundant species, followed by fallfish, cutlips minnow, and longnose dace.

Threatened or Endangered Aquatic Species and Aquatic Species of Special Concern

The eastern sand darter (*Ammocrypta pellucida*), listed as a threatened species by New York State, occurs in the lower Little Salmon River and the lower Salmon River near Fort Covington; however, the eastern sand darter does not occur in the project area. No federal or state-listed threatened or endangered aquatic species or species of special concern were encountered during the Fisheries Survey or other field studies conducted in 2011 and 2012.

Erie's consultation with the FWS, New York DEC, and New York Natural Heritage Program did not identify any federal or state-listed threatened or endangered aquatic species or species of special concern within the project vicinity.

Table 6. Chasm Project fish collections 2011.

Species		Chasm Project Area						Total
Scientific	Common	Impoundment Fall (CPUE)	Bypassed Reach		Tailrace Fall (CPUE)	Cold Spring Brook		
			Spring (CPUE)	Fall (CPUE)		Spring (CPUE)	Fall (CPUE)	
Catostomidae	Suckers							
<i>Catostomus commersonii</i>	White sucker	195 (138.95)	0	3 (1.75)	7 (11.38)	0	0	205
Centrarchidae	Sunfish							
<i>Micropterus dolomieu</i>	Smallmouth bass	3 (2.14)	0	1 (0.58)	0	0	0	4
Cyprinidae	Carps and Minnows							
<i>Exoglossum maxillingua</i>	Cutlips minnow	29 (20.67)	24 (15.41)	21 (12.26)	70 (113.77)	9 (21.94)	1 (2.18)	145
<i>Rhinichthys cataractae</i>	Longnose dace		39 (25.04)	70 (40.88))	25 (40.63)			143
<i>Rhinichthys atratulus</i>	Blacknose dace		17 (10.91)	47 (27.45)				64
<i>Rhinichthys sp.</i>	Unidentified dace	1 (0.71)						1
<i>Semotilus atromaculatus</i>	Creek chub				1 (1.63)			1
<i>Semotilus corporalis</i>	Fallfish	92 (65.56)	0	30 (17.52)	34 (55.26)	0	0	156
Esocidae	Pike							
<i>Esox lucius</i>	Northern pike	10 (7.13)	1 (0.64)	0	0	0	0	11
Ictaluridae	North American Catfish							
<i>Ictalurus nebulosus</i>	Brown bullhead	6 (4.28)						6
<i>Noturus insignis</i>	Margined madtom		2 (1.28)	12 (7.01)	2 (3.25)	0	0	16
Percidae	Perch							
<i>Perca flavescens</i>	Yellow perch	3 (2.14)	0	0	0	0	0	3
Salmonidae	Trouts							
<i>Salvelinus fontinalis</i>	Brook trout	0	15 (9.63)	15 (8.76)	7 (11.38)	20 (48.75)	19 (41.48)	76
<i>Salmo trutta</i>	Brown trout	0	6 (3.85)	9 (5.26)	5 (8.13)	29 (70.68)	42 (91.69)	91
Cottidae	Sculpins							
<i>Cottus cognatus</i>	Slimy sculpin	0	2 (1.28)	4 (2.34)	9 (14.63)	23 (56.06)	54 (117.89)	92
Total Catch		339 (241.57)	106 (68.06)	212 (123.82)	160 (260.05)	81 (197.43)	116 (253.24)	1,014
Total Species		8	8	10	9	4	4	15

Table 7. Total catch and relative abundance (percent of total) of fish families collected for both the summer and fall seasons combined.

Family	Number (percent of total)		Total (percent of total)
	Impoundment	Riverine (Bypassed Reach, Tributary, and Tailrace)	
Cyprinidae	122 (36.0)	388 (57.5)	510 (50.3)
Catostomidae	195 (57.5)	10 (1.5)	205 (20.2)
Salmonidae	0 (0)	167 (24.7)	167 (16.5)
Cottidae	0 (0)	92 (13.6)	92 (9.1)
Ictaluridae	6 (1.8)	16 (2.4)	22 (2.2)
Esocidae	10 (2.9)	1 (0.1)	11 (1.1)
Centrarchidae	3 (0.9)	1 (0.1)	4 (0.4)
Percidae	3 (0.9)	0 (0)	3 (0.3)
TOTAL	339	675	1,014

Aquatic Macroinvertebrates

Macroinvertebrates are an important component of aquatic ecosystems. Not only are they an important food resource for fish, but macroinvertebrates are also important to a variety of instream processes, such as the breakdown of organic matter, and are useful as water quality indicators. Typically, a diverse, well-balanced macroinvertebrate community is indicative of a healthy stream ecosystem.

As described above, the macroinvertebrate community in the bypassed reach and the Salmon River downstream of the project's tailrace is representative of excellent water quality. In addition to the standard water quality metrics, Erie also examined species diversity and dominance.¹⁴ High species diversity values are associated with diverse, well-balanced communities as are low dominance values. Erie observed

¹⁴ Species Diversity – A measure of species richness and community balance (evenness). Shannon-Wiener diversity values were calculated using the formula identified in Weber (1973; as cited in New York DEC 2009). High species-diversity values are associated with diverse, well-balanced communities.

Species Dominance – The percent contribution of the most numerous species, which is a measure of community balance, or evenness, of the distribution of individuals among the species. Simple dominance is the percent contribution of the most numerous species. Dominance-3 is the combined percent contribution of the three most numerous species. High dominance values may be an indication of an unbalanced community.

between 26 and 59 different macroinvertebrate species (~44 species average) at the three different sample locations. Both diversity and dominance metrics suggest that the macroinvertebrate community is well-balanced and diverse. No single species or group of species appeared to constitute a high percentage of the population. Site-specific values for the total number of organisms, density, species richness, diversity, and dominance are displayed below in Table 8.

Table 8. Average metric data from sample sites.

	Site 1 (pool/run) N = 352				Site 2 (riffle) N = 988				Site 3 (riffle) N = 950			
	1	2	3	Average	1	2	3	Average	1	2	3	Average
Number of Organisms Sorted	221	80	51	117	333	336	319	329	301	310	339	317
Estimated number of organisms per sample replicate	221	80	51	117	624	458	330	471	411	310	636	452
Density (number/m2)	97	35	22	51	273	201	144	206	180	136	278	198
SPP	59	30	26	38	50	43	52	48	51	48	38	46
Species Diversity	5.28	4.59	4.33	4.73	4.86	4.32	4.97	4.72	4.92	4.76	4.17	4.62
DOM-3	25.3	22.5	33.3	27.1	30.0	45.5	29.8	35.1	32.6	32.3	44.5	36.5
Simple DOM	11.8	7.5	15.7	11.7	15.9	25.6	13.8	18.4	14.6	14.2	19.5	16.1

3.3.1.2 Environmental Effects

This section assesses the potential effects of the operation of Erie's Chasm Project and alternatives on aquatic resources.

Sediment Management

The Chasm impoundment is partially filled by sand which must be periodically released downstream to allow for continued operation of the project. To accomplish this and in order to protect aquatic resources in the bypassed reach and downstream of the project, Erie proposes to continue to implement the Sediment Management Plan required by its existing license. The plan serves as the guide by which Erie manages and monitors sediments associated with the project and contains approved steps to allow controlled releases of sediments deposited in the project's impoundment.

Interior's original 10(j) recommendation no. 9 states that for the protection and enhancement of fish and wildlife, the existing Sediment Management Plan be incorporated as a license article in any new license issued for the project. Interior states

that if any changes to this plan are warranted, the licensee shall consult with the FWS and the New York DEC prior to submitting an amendment application to the Commission. Implementation of the Sediment Management Plan is also required by WQC condition no. 13.

Staff Analysis

As evidenced in 1997, uncontrolled sediment releases from the project's impoundment can adversely affect habitat and aquatic biota downstream of the project. The existing Sediment Management Plan identifies hydrologic conditions when sediment releases can be made. Under the plan, Erie only releases sediment when flow is above 700 cfs and expected to remain high for at least 24 hours after the sediment release. The plan also requires monitoring, the results of which indicate no adverse changes in sediment or aquatic habitat conditions following sediment releases. The results of Erie's macroinvertebrate and fisheries surveys in the project vicinity support this conclusion. Continued operation of the project in accordance with the Sediment Management Plan would ensure that sediment from the Chasm Project impoundment is effectively transported and dispersed downstream in a way that minimizes potential impacts of sediment releases on aquatic resources in the Salmon River.

If the need for changes to the Sediment Management Plan arises, the FWS recommends Erie consult with the FWS and New York DEC. Consultation with the agencies would likely facilitate any modifications to the existing plan and help ensure the protection of aquatic resources.

Minimum Flow Releases to the Bypassed Reach

Under the existing license, Erie continuously releases a minimum of 15 cfs into the 4,800-foot bypassed reach directly below the Chasm dam. This flow provides year-round habitat for aquatic resources in the bypassed reach. In accordance with section 3.3 of the Settlement Agreement, Erie proposes to maintain the minimum flow of 15 cfs from May 1 through October 1, and provide a flow of 23 cfs from October 2 through April 30, or flow equal to impoundment inflow, whichever is less. Erie would implement the new flow regime within 48 months of license issuance or by October 2, 2019, whichever comes later.

As evidenced by their execution of the Settlement Agreement, Interior, New York DEC, TU, and the Town of Malone support Erie's proposed measures regarding minimum flow releases. Condition no. 9 of the WQC would require the minimum flow releases described above. No alternative minimum flow recommendations were recommended by other entities.

Staff Analysis

In order to determine whether existing bypassed reach flows are adequate for the production and survival of aquatic species and identify an appropriate minimum flow in the bypassed reach, Erie conducted a Base and Bypass Flow Study (bypass flow study) using the Delphi approach.¹⁵ The Delphi team included representatives from FWS, New York DEC, TU, and Erie. The team developed management goals for the bypassed reach to determine whether or not certain demonstration flows (10, 15, 20, 25 and 50 cfs) achieved these goals. Erie also collected cross-sectional profiles, substrate information, and photographs in the bypassed reach. However, the Delphi team could not reach a consensus on which flow best achieved the agreed-upon management goals. After further consultation, the parties to the Settlement Agreement, which included parties from the Delphi team, determined that the 15-cfs minimum flow was adequate to support habitat and fish species from May 1 to October 1. The parties also determined that a flow of 23 cfs from October 2 to April 30 was necessary to support spawning and recreational fishing in the bypassed reach.

The highest priority Delphi -developed management goals for the bypassed reach include: 1) providing suitable habitat to support brook trout and brown trout; 2) providing suitable habitat for macroinvertebrates; and 3) ensuring the bypassed reach provides angling opportunities. Based on our analysis of the demonstration flows; all management goals, goal attainment criteria, and habitat suitability criteria for target fish species; along with the quantitative and qualitative data collected by Erie (see Base and Bypass Flow Study Report), a 15-cfs minimum flow in the bypassed reach is adequate to protect aquatic resources. However, some notable improvements for brown trout and macroinvertebrate habitat are realized at the 20-cfs demonstration flow (actual flow 21.37 cfs). Specifically, habitat with suitable depth (>1 foot) for adult and juvenile brown trout increased by an average of 48 percent in the middle and lower bypassed

¹⁵ The Delphi method utilizes a panel of experts employing qualitative observations of demonstration flow rates to reach a consensus flow recommendation for a given stream reach. Erie's study utilized an enhanced Delphi technique (see Arnold, S.H., et al. Collaborative instream flow resolution utilizing an enhanced Delphi technique, Waterpower '97: Proceedings of the International Conference on Hydropower; American Society of Civil Engineers, New York). The enhanced approach includes a wide array of fishery and non-fishery issues related to flow in the study reach, both qualitative and quantitative, and a systematic scoring protocol for the observed flows.

reach when flow increased from 15 to 20 cfs.¹⁶ Macroinvertebrate habitat also increased in the middle bypassed reach as total wetted width increased substantially in riffle and run habitat between the 15- and 20-cfs demonstration flow. The proposed 23-cfs winter flow is nearly equivalent to the actual 21.37-cfs flow observed during the Delphi study and would provide similar benefits. At higher flows, only minor improvements in habitat are achieved and greater velocities may actually limit habitat for certain species and lifestages of fish.

The quality of sport fishing opportunities likely increases at 23 cfs relative to 15 cfs and may continue to improve with increasing flow up to 35 cfs. At flows greater than 35 cfs, swift water may prevent angler access to some areas. Greater depths and velocities would also be present at the proposed 23-cfs flow relative to the existing 15-cfs flow which could improve spawning and incubation conditions for trout during the winter months. However, the bypassed reach is substrate limited and any improvement in spawning habitat due to increases in flow would likely be limited to the two side channels where some spawning substrate was observed.

Nevertheless, increasing the minimum bypassed reach flow from 15 to 23 cfs from October 2 to April 30 would notably benefit aquatic resources, especially early life stages of some species. Maintaining the 15-cfs minimum flow during the remaining summer months should continue to provide adequate habitat to support macroinvertebrates, fish, and angling opportunities. Other studies, including the water quality study, macroinvertebrate study, and the fisheries survey (described in section 3.3.2.1 above), indicate the existing minimum flow of 15 cfs is adequate for the production and survival of aquatic species during the summer months.

Base Flow and Impoundment Water Level

Erie currently provides a minimum base flow of 70 cfs, or flow equal to the impoundment inflow, whichever is less, in the Salmon River downstream of the confluence of the project's tailrace with the bypassed reach. In accordance with section 3.2 of the Settlement Agreement, Erie proposes to continue to release a 70-cfs base flow during the term of a new license.

Pursuant to section 3.1 of the Settlement Agreement, Erie proposes to reduce impoundment fluctuation due to project operation from 0.6 foot to 0.25 foot at river flows at or above 85 cfs and to 0.1 foot at river flows below 85 cfs.

¹⁶ Suitable depths of 1 foot or greater increased from an average width of 16 feet to 23.75 feet across the surveyed transects between the 15- and 20-cfs demonstration flows, respectively.

As evidenced by their execution of the Settlement Agreement, Interior, New York DEC, TU, and the Town of Malone support Erie's proposed measures regarding base flow and impoundment water level fluctuation. These base flow and impoundment water level measures would be required by WQC conditions nos. 8 and 11, respectively.

Staff analysis

During the Base and Bypass Flow Study, the Delphi team observed a flow of 70 cfs in the Salmon River downstream of the tailrace's confluence with the bypassed reach. All team members agreed that 70 cfs was adequate for aquatic resources in this section of the Salmon River and determined that no further study was needed.

Base flow would be interrupted if all three of Erie's turbines trip offline (powerhouse outage) and the water level in the impoundment is below the spillway crest (or top of flashboards, if installed) or if spill is insufficient to meet the 70-cfs base flow requirement. Erie proposes to minimize the magnitude of any such interruption by maintaining near-crest water levels in the impoundment. This would reduce the amount of time needed for spillage to occur.

In the event of a powerhouse outage that cannot be immediately restored, the Salmon River would receive the proposed 15-cfs (May 1 to October 1) or 23-cfs (October 2 to April 30) minimum bypassed reach flow, discharge from Cold Spring Brook, and drainage from the powerhouse tailrace when there is no spill at Chasm dam. This total flow should be adequate to sustain aquatic life in pools and most sections of the channel for several hours. However, some fish and aquatic macroinvertebrates could be stranded or die if base flow is not restored quickly.

Erie proposes to maintain near-crest water levels to reduce impoundment refill times so spill would occur faster relative to the current operating condition. Specifically, Erie would make a good faith effort to maintain impoundment water levels within 0.25 foot as measured in a downward direction from the spillway crest (or top of crest control device when installed)¹⁷ when inflow to the impoundment is more than 85 cfs and within 0.1 foot when inflow to the impoundment is below 85 cfs. The Settlement Agreement provides that impoundment levels of 0.5 foot or greater below the spillway crest would be considered a violation of normal operation.

Under all flow conditions, especially low-flow conditions (inflow < 85 cfs), base flow would be restored more quickly under the Settlement Agreement relative to the

¹⁷ An example of a crest control device includes year-round or seasonal flashboards. Erie typically installs flashboards during the summer months, but does not install them every year.

existing condition that requires impoundment water levels to be within 0.6 foot of the spillway crest.¹⁸ Based on our analysis of impoundment refill rates, maintaining near-crest water levels would provide a benefit to aquatic resources in the event of a prolonged powerhouse outage. For example, at the annual average flow of 228 cfs impoundment refill time would decrease from 42 minutes when impoundment water level is 0.6 foot below the spillway crest to 17 minutes when impoundment water level is 0.25 foot below the spillway crest. At an inflow of 80 cfs, refill time would decrease from 2 hours to 20 minutes under the proposed impoundment fluctuation limits.

There is still a potential risk to aquatic resources, but the probability of all three turbines tripping offline while the impoundment is below spillway crest is low. Since Erie acquired the Chasm Project in September 2004, only three interruptions to the minimum base flow have occurred, with the last interruption occurring on November 28, 2004. The Commission's project record shows that all of the powerhouse outages resulting in an interruption of minimum base flow were the result of extraneous circumstances outside of Erie's (and previous licensee's) control including icing of the intake structure, grid operation, and tree fall on transmission lines. In most instances, Erie is able to dispatch an operator and restart the turbines in less than 1 hour. Erie did not observe impacts to aquatic resources as a result of interruption to the minimum base flow during previous outages. As such, it seems that maintaining near-crest water levels would adequately protect aquatic resources downstream of the project if base flows were interrupted due to operating emergencies.

Stream Flow and Water Level Monitoring

In accordance with section 3.6 of the Settlement Agreement, Erie proposes to develop, within 24 months of license issuance, a stream flow and water level monitoring plan in consultation with the FWS and New York DEC that would permit independent verification of impoundment water levels, flow in the bypassed reach, and base flow downstream of the project. The plan would include provisions to install binary staff gages that would be visible to the public. All necessary equipment would be operational and calibrated within 36 months of the issuance date of a new license. Erie would also establish a public website that provides daily flow information associated with the Salmon River downstream of the project. Erie would maintain accurate records of water level elevations in the impoundment and project flows that would be available to the New York DEC upon request.

As evidenced by their execution of the Settlement Agreement, the FWS, New York DEC, TU, and the Town of Malone support Erie's proposal to develop and

¹⁸ We note that base flow could also be restored by the plant operator restarting at least one turbine or, in some cases, manipulating flashboards.

implement a stream flow and water level monitoring plan. Preparation and implementation of a stream flow and water level monitoring plan would be required by WQC condition no. 10.

Staff analysis

According to the information provided in the Final Study Report and license application it is clear that Erie currently maintains accurate records of impoundment elevations and project flows. However, implementation of a monitoring plan would provide data to ensure that Erie maintains adequate water level and flows for aquatic resources under the new impoundment fluctuation, base flow, and bypassed reach minimum flow measures and provide for independent verification by the FWS and New York DEC.

Developing the plan in consultation with the FWS and New York DEC would likely facilitate the placement of gages, development of a reporting website, and exchange of project flow and water level information to the New York DEC. As such, Erie's proposal would provide a means to monitor operations and make adjustments as necessary to ensure the protection of aquatic resources.

Fish Entrainment and Impingement

The powerhouse intake has the potential to affect the impoundment fishery by entraining fish or by impinging fish against the trash rack, resulting in fish injury or mortality. Pursuant to section 3.4 of the Settlement Agreement, Erie proposes to maintain the existing configuration of the trash racks with 1-inch clear bar spacing to reduce entrainment and impingement of fishes.

As evidenced by their execution of the Settlement Agreement, the FWS, New York DEC, TU, and the Town of Malone support Erie's proposal to maintain trash racks with 1-inch clear bar spacing at the project intake. Maintenance of a trash rack with 1-inch spacing on the project intake would be required by WQC condition no. 12.

Staff analysis

In the Final Study Report, Erie presents the results of its Fish Passage and Protection Study. To conduct this study, Erie assembled a team with representatives from the FWS, New York DEC, and TU to view existing environmental conditions and aspects of the project in the field on July 9, 2012. The main goal of this study was to assess the need for fish passage structures at the project, which no team member felt was necessary based on the differences in fish communities and management goals between the Salmon River downstream of the project and the Chasm impoundment. In addition, the team also evaluated whether or not the current configuration of the trash

racks adequately protects the fishery in the impoundment. Erie calculated intake velocities at the trash racks and reviewed these data, the existing trash rack configuration, and fish assemblage data for the impoundment and the Salmon River with the team during the site visit on July 9, 2012.

Erie calculated a maximum intake velocity of 0.8 foot per second when the powerhouse is drawing the maximum 235 cfs through the project. The low intake velocities calculated for the Chasm Project are generally well below the swim speeds needed for escape by most life stages of fish present in the impoundment and the risk of entrainment or impingement seems low. For example, juvenile and adult white sucker prefer flow velocities up to 2.3 and 2.5 fps,¹⁹ respectively, and juvenile (8-inch-long) northern pike have burst swim speeds of 5.7 fps (Peake 2008). Some very small juvenile fish may be entrained, especially during colder months when lower water temperatures would decrease maximum swimming speeds. However, all team members reviewed the trash rack design and intake velocity during the site visit and determined that the existing 1-inch clear bar spacing was adequate for fish protection.

Based on our review, impingement is unlikely to occur because small fish that cannot outswim the intake would pass through the trash racks. Entrainment of small juvenile fish would occur, but would occur infrequently because juvenile fish would be able to swim away from the intake under most conditions. As such, Erie's proposal to maintain the existing 1-inch clear bar spacing of the trash racks should adequately protect the fishery in the impoundment.

Cumulative Effects

Impoundment Fluctuation and Base Flow

The proposed 70-cfs base flow downstream of the project would protect aquatic habitat, fish, and macroinvertebrates in the Salmon River. The seasonal Titus Mountain water withdrawal, located approximately 1.5 miles downstream of the project, could decrease downstream flows in the Salmon River during the months of November through February and has the potential to affect aquatic resources in the Salmon River. However, the maximum withdrawal by Titus Mountain is slightly less than 4.5 cfs and withdrawals only occur to the extent needed for snow-making operations. Accordingly, Titus Mountain would have a minimal effect on Salmon River flow under normal operating conditions of the Chasm Project because it would reduce flows a maximum of 6.43 percent and proportionally less if flows through the project exceed 70 cfs.

In the event of an outage at the Chasm powerhouse when the impoundment water

¹⁹ See table 9-6 of the Base Flow and Bypass Flow Study in Erie's final study report.

level is below spillway crest, total flow downstream of the Chasm Project may be as little as 28 cfs (i.e., sum of 23-cfs bypassed reach minimum flow and flow from Cold Spring Brook). We are uncertain as to whether the Titus Mountain pumps would receive river flow under these conditions, but we assume the pumps are located at a low point which ensures continuous access to the Salmon River. Under this worst case scenario, the Titus Mountain withdrawal (maximum of about 4.5 cfs when operating) may reduce flow in the Salmon River to 23.5 cfs. This flow would still likely be able to sustain fish and other species in pool and deeper run habitat, but some additional stream habitat would be exposed until base flows are restored. The likelihood of a powerhouse outage during a time when the Titus Mountain water withdrawal is pumping at full capacity is low, but this scenario may result in some fish stranding and loss of macroinvertebrates.

In conclusion, the cumulative effects associated with potential interruptions in base flow at the Chasm Project together with the Titus Mountain water withdrawal, should they co-occur, could have a slight negative impact on aquatic resources relative to the effects of the Chasm Project alone.

Sediment Transport

Following the 1997 sediment release, described above in section 3.3.1, the Commission directed Erie to develop a plan to manage sediment releases and protect aquatic resources downstream of the project. The Sediment Management Plan, filed July 5, 2012, identifies suitable high-flow conditions under which Erie can release sediment from the low-level sluice gate at Chasm dam. Releasing sediment during high flows (over 700 cfs) should ensure that sediment remains in suspension and is transported downstream. However, other structures also affect sediment transport in the Salmon River including Mountain View Dam, located upstream of the Chasm Project, and the Ballard Mill, Whittelsey, and Macomb hydroelectric projects, located downstream of the Chasm Project.

As sediment is carried downstream in the Salmon River, some sediment may be deposited in the various impoundments, but the shallow depths observed in the Chasm impoundment (~ 4 foot maximum depth) and satellite imagery for Mountain View Lake, the Chasm impoundment, and Lamika Lake (impoundment of Macomb dam)²⁰ indicates that the impoundments are now mostly filled with sediment. These impoundments are shallow and likely retain sediment under low and normal flow conditions, but export sediment under high-flow conditions. The Ballard Mill and Whittelsey projects are smaller projects with small impoundments that do not retain much sediment, but a similar pattern of deposition and scour likely occurs in these

²⁰ Map data ©2015 Google

impoundments as well. As such, it is unlikely that sediment releases at the Chasm Project would result in any additional accumulation of sediment behind any of the downstream impoundments as long as sediment releases are conducted in accordance with the existing Sediment Management Plan.

Both the Chasm and Macomb projects implement sediment management plans to reduce the likelihood of unplanned releases and to minimize the impact of planned sediment releases. During high-flow events both of these projects may execute sediment releases which could elevate sediment loading downstream of the projects. However, the high-flow conditions (over 700 cfs) under which sediment releases occur would naturally yield high sediment loads, and the additional sediment loading from sediment releases should be relatively minor. Results of the sediment monitoring conducted to date indicates that sediment from planned releases moves out of the Salmon River, likely all the way to the St. Lawrence River, and does not accumulate in riverine habitat and that little to no impact on aquatic habitat occurs as a result of sediment releases from the Chasm or Macomb projects.²¹

Overall, cumulative effects associated with sediment releases and transport at the Chasm Project together with the effects of other dams and sediment releases at the Macomb Project likely have an overall positive impact on aquatic resources by ensuring sediment is transported out of the system and not deposited in riverine habitat.

3.3.2 Terrestrial Resources

3.3.2.1 Affected Environment

Much of the mountainous portions of New England and New York are within the Level III Northeastern Highlands ecoregion as defined by the United States Environmental Protection Agency (EPA). Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. The EPA defines the Northeastern Highlands ecoregion as characterized by hills and mountains, extensive forest cover, nutrient-poor frigid and cryic soils (mostly Spodosols), numerous glacial lakes, wetlands, bogs, and high-gradient cold water streams. Forest vegetation is somewhat transitional between the boreal regions to the north in Canada and the broadleaf deciduous forests to the south. Typical forest types include northern hardwoods (maple-beech-birch), northern hardwoods/spruce, and northeastern spruce-fir forests. The region is sparsely populated compared to adjacent regions; farm-to-forest conversion began in the mid-19th century and continues today. In spite of this trend, alluvial valleys, glacial lake basins, and areas of limestone-derived

²¹ See annual sediment management plan reports for the Chasm and Macomb projects filed under P-7320 and P-7321, respectively.

soils are still farmed for dairy products, forage crops, fruits, and vegetables. The timber industry, recreational homes, and associated lodging and services sustain the forested regions economically, but they also create development pressure that threatens to change the character of the region. Many of the lakes and streams in the region are sensitive to acid deposition originating from industrial sources in the west and southwest.

Within the broader Level III ecoregions that comprise New York State, the EPA has defined 42 Level IV ecoregions that reflect the regional ecological diversity and character. The Chasm Project is located within the Level IV Northern and Western Adirondack Foothills ecoregion. This area marks the change from more erodible shale and limestone in the Mohawk, Black, and St. Lawrence River valleys to the more resistant rocks of the Adirondack Mountains. The northern and western Adirondack foothills are characterized by ridges and mountains of low-to-moderate relief, a network of intersecting glacial outwash channels that wind among low hills, and stream channels that have been deranged by thick deposits of Pleistocene-age glacial till. Elevations across the northern and western Adirondack foothills generally range from 750 to 2,000 feet, although isolated mountains range from 2,800 to 3,300 feet. Local relief is between 75 and 600 feet. Spruce was a dominant tree species in this region historically, but it was favored by early loggers, and most of the region is covered with second growth hardwood forest today.

Upland Habitats

Spruce-northern hardwood forests are the most common upland habitat type in the project area. These forests are generally characterized by a well-developed canopy of red spruce, sugar maple, American beech, yellow birch, red maple, and balsam fir. Common subcanopy species include striped maple and mountain maple. Characteristic shrubs include hobblebush, American fly honeysuckle, and Canada yew. Characteristic ground layer plants include wood sorrel, common wood fern, shining clubmoss, wild sarsaparilla, Canada mayflower, Indian cucumber-root, and twisted stalk.

Mammals typically found in upland habitats include raccoon, long-tailed weasel, eastern gray squirrel, striped skunk, and white-footed mouse. Some common bat species include the little brown bat and big brown bat. These mammals are normally found in woodland/riparian areas due to food requirements, predator/prey relationships, and a preference by several species for trees as den or nest sites.

Riparian and Littoral Habitat

Riparian habitats are areas that support vegetation found along waterways such as lakes, reservoirs, rivers, and streams. Riparian areas differ from the uplands because of their high levels of soil moisture, frequency of flooding, and unique assemblage of

plant and animal communities. Riparian areas and the associated vegetation provide important habitat for wildlife and often contain a higher number of species, both plant and animal, than surrounding upland areas due to the proximity to water. Wildlife species typically found in riparian habitats include raccoon, deer, common gartersnake, eastern ribbon snake, spotted salamander, gray tree frog, striped skunk, gray fox, coyote, muskrat, white-footed mouse, and Virginia opossum. Many species utilize riparian zones for shelter, venturing into more aquatic and/or terrestrial habitats to forage and reproduce.

Erie surveyed riparian habitat at the Chasm Project as part of its Wetland Study conducted in 2011. In the project area, the most abundant riparian trees included silver maple, ashes, red maple, elms, hickories, sycamore, oaks, and river birch. The most abundant riparian shrubs in the project area included ironwood, speckled alder, dogwoods, and various viburnum species. The most abundant riparian herbs in the project area included sensitive fern, jewelweeds, ostrich fern, and goldenrods.

Erie also surveyed littoral habitat at the Chasm Project. Littoral habitats are found in the shallow waters near the shoreline of the river or impoundment. The project's littoral habitat contains areas of submerged aquatic vegetation (SAV). SAV performs many important ecosystem functions, including wave attenuation and sediment stabilization, water quality improvement, food web support, and provision of critical nursery and refuge habitat for fish species. SAV within the project's impoundment was observed during the Fisheries Survey on September 12, 2011 and the Impoundment Fluctuation Survey conducted on November 9, 2011. In total, an estimated 1.6 acres of SAV occurs within the impoundment.

Wetland Habitats

Wetlands are generally defined as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support vegetation typically adapted for life in saturated soil conditions. Most formal wetland definitions emphasize three primary components that define wetlands: the presence of water, unique soils, and hydrophytic vegetation.

Erie conducted a study of wetland habitat in the project area in accordance with the Wetland Study Plan. The study was divided into three major tasks: (a) development of preliminary wetland cover-type maps from existing sources of data using a Geographic Information System (GIS); (b) field verification of preliminary wetland maps conducted concurrently with other relicensing studies; and (c) identification of significant aquatic vegetation and invasive species observed during field efforts associated with other relicensing studies. Approximately 15 days of field observations were performed in conjunction with field study activities conducted at the project in

2011. The field verification task was used to compare and verify the accuracy of the wetland cover-type maps and to update these maps accordingly.

Based on satellite imagery, National Wetlands Inventory (NWI) and New York DEC wetland data, and the results of the Wetlands Study conducted in 2011, extensive wetland communities are generally lacking within the project boundary. Wetlands along the Salmon River are primarily confined to narrow bands immediately adjacent to the river, with slightly larger bands found in former river channels adjacent to the impoundment. The most common wetland habitats in the project boundary are represented by the open-water habitats of the project impoundment. Wetlands within the project area, other than open-water habitats, are generally represented by, palustrine forested (PFO), palustrine scrub-shrub (PSS), and palustrine emergent (PEM) wetland types. Based on FWS NWI maps there are approximately 26.08 acres of potential wetlands within the project boundary. Table 9 lists the dominant plant species found in each wetland type at the project.

Table 9. Areas and dominant species of wetland and aquatic cover types in the Chasm Project study area.

Type	Dominant Species
Palustrine Forested (PFO)	Silver maple, ashes, red maple, elms, hickories, sycamore, oaks, and river birch, ironwood, speckled alder, dogwoods, various viburnum species, sensitive fern, jewelweeds, ostrich fern, and various goldenrod species
Palustrine Scrub-Shrub (PSS)	Speckled alder, meadow-sweet, steeple-bush, gray dogwood, swamp azalea, highbush blueberry, maleberry, spicebush, various willow species, and arrowwood.
Palustrine Emergent (PEM)	Cattails, pickerel weed, arrowhead, duckweeds, and spatterdock in deeper water habitats. Bluejoint grass, cattails, sedges, marsh fern, sweetflag, tall meadow rue, marsh St. John's wort, various goldenrod species, sensitive fern, and common skullcap in shallower water habitats.

Invasive Plants

Between April 25 and November 9, 2011, in association with other field studies, Erie surveyed for invasive species such as common reed, purple loosestrife, garlic mustard, Eurasian watermilfoil, and curlyleaf pondweed. During this period, Erie performed approximately 15 days of field observations and found no invasive species within the project area.

Species of Special Concern

Bald eagle

Bald eagles are large migratory raptors whose habitat includes estuaries, large lakes, reservoirs, rivers, and some seacoasts. Most eagles forage primarily on fish, with lesser quantities of waterfowl, carrion, and small mammals. Eagles mate for life, typically nesting in large, super-canopy trees or snags within 0.25 to 1 mile of large bodies of open water such as lakes and large rivers. They prefer a nest site at the edge of the forest, near foraging areas, with unobstructed views and little human disturbance. Because they typically use and enlarge the same nests each year, nests may reach 10 feet across and weigh a half ton. They may also have one or more alternate nests within their breeding territory. The birds travel great distances but usually return to breeding grounds within 100 miles of the place where they were raised. The entire breeding cycle, from initial activity at a nest through the period of fledgling dependency, is about 6 months (FWS 2007).

The bald eagle is listed as threatened by the state of New York and is protected at the federal level under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (MBTA). Bald eagles are known to traverse through the project area, but no birds or nests were observed by Erie during the 2011 field studies.

Osprey

The osprey is a migratory, fish-eating bird of prey, which nests on trees and other structures near water. Ospreys feed primarily on live fish, which they catch by using their long, hooked talons. An osprey sometimes plunges deep enough to momentarily submerge its entire body. Ospreys build nests near the water; 10 to 60 feet above the ground near the tops of trees. They can also nest on the ground or on cliffs and use a variety of structures, including power poles, chimneys, channel markers, and duck blinds. The decline of this species was caused by DDT-induced eggshell thinning, which reduced the reproductive output of breeding pairs.

The osprey is listed as “special concern” by the state of New York and is protected at the federal level under the MBTA. Although no individual ospreys or nests were observed by Erie during the 2011 field studies, ospreys are known to utilize habitat similar to that of bald eagles, and bald eagles are known to utilize habitat in the project area.

3.3.2.2 Environmental Effects

This section assesses the potential effects of the operation of Erie’s Chasm

Project and alternatives on terrestrial resources.

Invasive Species and Vegetation Management

Although no invasive species have been found at the project, continued operation of the project would require vegetation management activities around project features such as the transmission line, powerhouse, dam abutments, penstock, and recreational facilities, which could potentially allow invasive species to become established. In accordance with section 3.7 of the Settlement Agreement, Erie proposes to implement an Invasive Species Management Plan to prevent the introduction and spread of invasive species during any construction, maintenance, and operational activities. The Invasive Species Management Plan was filed as an appendix to the Settlement Agreement. Erie's Invasive Species Management Plan was developed in consultation with FWS and New York DEC.

The plan addresses both aquatic and terrestrial invasive species. It would require Erie to comply with New York DEC recommended measures for preventing the introduction and spread of aquatic invasive species when conducting in-water work for daily operation and routine maintenance, such as inspecting for and removing any aquatic vegetation found on boating equipment. The plan also contains a provision for New York DEC to install and maintain an invasive species disposal station and educational signage at the Titus Mountain boat launch, located about 3,000 feet upstream of the Chasm dam.

For terrestrial invasive plants, the plan would require Erie to inspect and remove any vegetation from construction equipment, refrain from planting invasive terrestrial plants, and utilize only weed-free seed, straw, soil amendments, gravel fill, or mulch. The plan would also require Erie to monitor any areas disturbed by construction or maintenance activities for invasive species and to treat them during the first full growing season.

As evidenced by their execution of the Settlement Agreement, the FWS, New York DEC, TU, and the Town of Malone support Erie's proposal to implement its Invasive Species Management Plan. Implementation of the plan would be required by WQC condition no. 14.

Staff analysis

No new construction is proposed at the Chasm Project. Currently vegetation management is conducted on an as-needed basis using mostly mechanical vegetation removal techniques (e.g. mowing).

Because most of the habitat in the project area where vegetation management occurs has previously been disturbed, or is currently developed, much of the existing wildlife and botanical community is tolerant to this disturbance. Therefore, routine vegetation management activities would not likely affect wildlife species and continued operation of the project is not expected to have an adverse impact on botanical resources. Because no invasive plant species were found in the project area, and no new disturbance is anticipated at the project that would introduce invasive plant species in the project area, we do not anticipate any effects from invasive plants due to continued project operation. Nevertheless, the Settlement Agreement's invasive species management plan would help to prevent the introduction and spread of invasive plants due to future disturbances caused by any unforeseen construction or maintenance activities or accidental introductions throughout the term of a license.

Impoundment Fluctuation

Water-level fluctuations in the project's impoundment are largely driven by natural atmospheric and hydrologic conditions, the operation of the upstream Mountain View dam, and the operation of the Chasm Project within the constraints of the current license. Frequent or extreme water level fluctuations may adversely affect wetland, riparian, and littoral habitats, or associated submerged aquatic vegetation and wildlife.

As discussed previously, pursuant to Settlement Agreement section 3.1, Erie proposes to reduce impoundment fluctuation due to project operation from 0.6 foot to 0.25 foot at river flows at or above 85 cfs and to 0.1 foot at river flows below 85 cfs.

As evidenced by their execution of the Settlement Agreement, Interior, New York DEC, TU, and the Town of Malone support Erie's proposed measures regarding impoundment water level fluctuation.

Staff analysis

Erie conducted an impoundment fluctuation study in 2012 to evaluate the effects of its proposed change in impoundment fluctuation on wetland, riparian, and littoral habitats at the Chasm impoundment. Erie compiled hourly impoundment level data collected at the project impoundment for the calendar years 2004 to 2011. Additionally, fluctuation zone habitats were observed in the Chasm impoundment on November 9, 2011, while the impoundment was drawn down to 0.6 foot (elevation 1,283.2 feet) below the top of the spillway crest. Additional field observations were conducted prior to that date during other scheduled field studies.

Erie's study showed that over the 8-year period of record, the Chasm impoundment has operated within 0.6 foot of the dam crest or top of the flashboards (when in place) or higher about 98.6 percent of the time. During the growing season

(May 1 – September 30), the Chasm impoundment has operated within 0.6 foot of the dam crest or the top of the flashboards (when in place) or higher approximately 97.0 percent of the time for the period of record.

The wetland communities associated with the project were found to be generally healthy and appeared to be in a state of equilibrium with the current project operation. The species richness and diversity of all wetland types bordering the project impoundment generally reflect natural community expectations for this area. Based on field observations during the Wetland Study, there were no apparent project-related impacts to wetland resources observed within the project vicinity. The range of water level fluctuations and their frequency and duration of occurrence in the project impoundment is such that the hydrology for the adjacent wetlands is not being adversely affected to inhibit wetland vegetation growth and vigor. The proposed decrease in impoundment fluctuation is relatively minor and not expected to affect wetland, submerged aquatic vegetation, riparian, littoral habitat, or associated wildlife in the project vicinity.

3.3.3 Threatened and Endangered Species

3.3.3.1 Affected Environment

Prior to filing its license application, Erie consulted with Interior concerning the presence of federally listed threatened or endangered species. At that time, no species or designated critical habitat were known to occur in the vicinity of the Chasm Project. Since then, the northern long-eared bat (*Myotis septentrionalis*) was listed as federally threatened under the ESA. According to the FWS' Environmental Conservation Online System, the northern long-eared bat is known or believed to occur in Franklin County, New York.²²

The northern long-eared bat's range extends from Maine to North Carolina along the Atlantic coast. Its listing, which became effective May 4, 2015, was due to declines caused by white-nose syndrome, as well as the continued spread of the disease. Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They typically use large caves or mines with large passages and entrances, constant temperatures, and high humidity with no air currents. During summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or

²²<http://ecos.fws.gov/speciesProfile/profile/countiesByState?entityId=10043&state=New%20York>, accessed June 11, 2015.

crevices. It has also been found, rarely, roosting in structures like barns and sheds. Northern long-eared bats emerge at dusk to fly through the understory of forested hillsides and ridges feeding on moths, flies, leafhoppers, caddisflies, and beetles. Northern long-eared bat also feeds by gleaning motionless insects from vegetation and water surfaces (FWS 2015). Fall migration and the return to wintering habitat occur between mid-August and mid-October.

3.3.3.2 Environmental Effects

Erie does not propose any measures for the protection of the northern long-eared bat, and no agency or other stakeholder has recommended any such measures.

Staff Analysis

According to the FWS web site, the northern long-eared bat is known or believed to occur in Franklin County, New York. Consultation with the FWS indicates that it is not known to occur in the project vicinity. Erie did not conduct surveys for the northern long-eared bat and no entity requested that surveys be conducted. As a result, the presence of northern long-eared bat at the project cannot be ruled out.

Although potential roosting and foraging habitat for the northern long-eared bat may exist within the project area, along the riparian forested edges of the river and impoundment, and forested edges along the penstock right-of-way, Erie does not propose any activities that would result in more than a minimal amount of tree clearing, which would be permissible under the interim 4(d) rule that exempts certain activities, such as minimal tree removal and maintenance of utility right-of-ways, from incidental take restrictions. Continued vegetation management practices, such as trimming and herbicide application, would be unlikely to affect trees large enough to provide roosting habitat for bats. Therefore, the continued operation of the Chasm Project is not likely to adversely affect the northern long-eared bat, should they occur at the project.

3.3.4 Recreation

3.3.4.1 Affected Environment

Local and Regional Recreation Opportunities

The varying physical characteristics of the area provide for diverse recreation opportunities in the vicinity of the Chasm Project. Within the region, the Titusville Mountain State Forest, Adirondack State Park, and the Adirondack Trail Scenic Byway provide public access for recreational activities. Titusville Mountain State Forest is located about 10 miles southeast of the project; it covers 7,471 acres and is managed by the New York State DEC. Adirondack State Park encompasses approximately 6 million

acres, with 3,000 lakes, 30,000 miles of rivers and streams, globally unique wetlands, and old-growth forest lands. The park includes opportunities for fishing, camping, hiking, birding, hunting, trapping, and flatwater and whitewater paddling. The Adirondack Trail Scenic Byway begins in Malone, New York and extends 188 miles south and through the Adirondack State Park to Fonda, New York on the Erie Canal.

Recreation Facilities in the Project Area

Recreation access areas outside of the project boundary near the Chasm Project include the Titusville Mountain Access Site and the William A. King Memorial Park. The Titusville Mountain Access Site is owned and maintained by the New York State DEC. It includes a car-top boat launch at the Chasm Project impoundment about 3,000 feet upstream of the dam. The site provides access to flatwater paddling opportunities in the project's impoundment and the section of the Salmon River extending from the project upstream to Mountain View dam. The William A. King Memorial Park is located approximately 3 RM downstream of the project and is operated by the Town of Malone under a lease agreement from National Grid. The park offers informal access to the Salmon River where recreationists can launch a canoe or a kayak.

Erie owns and maintains two recreation access areas within the project boundary: the Chasm Falls Recreation Area and an informal parking area adjacent to the powerhouse that provides access to the bypassed reach. The Chasm Falls Recreation Area is located approximately 500 feet downstream of the confluence of the project's bypassed reach and tailrace. At this site, there is a parking area for seven vehicles, an unimproved road/footpath for access to the Salmon River, and a picnic area with two picnic tables and a charcoal grill. The unimproved road/footpath is also used by the New York State DEC as an access point for stocking fish in the Salmon River. The informal access at the bypassed reach includes a parking area for three vehicles. No other amenities are provided at this access area. Table 10 identifies the facilities currently provided within the project boundary.

Table 10 Existing Project Recreation Facilities

Recreation Site Name	Recreation Facilities
Chasm Falls Recreation Area	seven-vehicle parking area, unimproved road/footpath, two picnic tables, charcoal grill
Informal Bypassed Reach Access Area (near the powerhouse)	Parking for three vehicles

Recreation Use of the Project Area

Recreation use at the project was recorded through incidental observations while field activities for other relicensing studies were performed. Incidental observations were also recorded by Erie's travelling operators between April 2011 and August 2013. These observations were recorded on Incidental Recreation Observation Documentation Forms. A total of 27 people were observed on 12 different occasions at the Chasm impoundment, the bypassed reach, the Chasm Falls Recreation Area, and the Titusville Mountain Access Site. Recreation observations at the project indicate that the Chasm Falls Recreation Area is utilized primarily as an access site for shoreline fishing; while other recorded uses of the site include dog walking and a rest area for cyclists. The informal recreation access area at the powerhouse provides access to the bypassed reach, which provides a high-quality trout habitat; in-stream fishing along the lower bypassed reach was documented during the summer of 2012.

The Titusville Mountain Access Site, while outside of the project boundary, provides anglers and boaters with access to the project's impoundment and the upstream reach of the Salmon River between the Chasm Project and the Mountain View dam. The Titusville Mountain Access Site provides access to flatwater paddling for inexperienced canoeists and kayakers; it is also the only public boat launch that provides access to "The Bend." The Bend is a deep pool in the Salmon River approximately 1.7 RM upstream from the Chasm dam; it is located outside of the project boundary but is popular among local anglers.

3.3.4.2 Environmental Effects

Erie proposes to implement the Recreation Management Plan (RMP), which was included as an appendix to the Settlement Agreement. The plan includes measures to: (1) install a footpath at the informal recreation area at the powerhouse; (2) install signage at the informal recreation area designating the fishing area, footpath, and parking area; (3) install signage near the powerhouse identifying restricted areas including the upper bypassed reach, the substation, and the tailrace area; (4) continue to maintain the Chasm Falls Recreational Area as a river access point, but remove existing picnic amenities; (5) provide the Town of Malone a one-time donation of two wooden picnic tables at the William A. King Memorial Park; and (6) install signage at the Chasm dam indicating "No Parking" and directing the public to the upstream Titusville Mountain Access Site. Figure 8 shows the location of the proposed project recreational facilities. Table 11 summarizes the new and existing recreation amenities to be provided by Erie under the Settlement Agreement.

As evidenced by their execution of the Settlement Agreement, Interior, New York DEC, TU, and the Town of Malone support Erie's proposed Recreation Management Plan.



Table 11. Existing and Proposed Project Recreation Facilities under the Settlement Agreement

Recreation Site Name	Recreation Facilities
Chasm Falls Recreation Area	Seven vehicle parking area, footpath
Informal Bypassed Reach Access Area (near the powerhouse)	Install a footpath; install signage to (a) identify the designated fishing area and footpath, (b) identify the two-vehicle parking area, and (c) identify restricted areas including the upper bypassed reach, the substation, and the tailrace area

Staff analysis

Recreational use at the project is provided through two access areas within the project boundary and two access areas outside of the project boundary. Combined, the four sites provide access to the impoundment, the bypassed reach, shoreline and boat angling, and flatwater paddling opportunities for the public. Recreational use at the project is below capacity and estimated at approximately 10 percent of capacity at the informal recreation access site and 25 percent at the Chasm Falls Recreation Area. Projections from the New York State Office of Parks, Recreation, and Historic Preservation indicate that the supply/demand ratio for recreational fishing, canoeing, and kayaking in Franklin County will be below the statewide average through 2025.

The measures proposed in the Recreation Management Plan appended to the Settlement Agreement were developed through Erie's consultation with New York State DEC, FWS, Trout Unlimited, and the Town of Malone. During consultation, the parties discussed how to enhance the recreation user experience. New York State DEC and Trout Unlimited recommended that additional signage be posted at the project's powerhouse to clearly indicate where anglers can park and where access is restricted. Trout Unlimited explained that the informal parking area is currently used for angler parking but it was unclear from existing signage whether public parking was permitted. In addition, both parties recommended signage near the dam directing recreationists to the Titusville Mountain Access Site. The settling parties agreed that no enhancements should be made to the informal parking area at the Chasm dam because increased usage could pose traffic and safety issues. The parties agreed that the Titusville Mountain Access Site currently offers sufficient access and no additional enhancements were recommended. The parties discussed that given the proximity of the downstream William A. King Memorial Park relative to the Chasm Falls Recreation Area, both sites did not need to serve as picnic areas. The group discussed that Chasm Falls Recreation Area should serve primarily as a river access point by providing parking and a footpath

to the river, whereas the William A. King Memorial Park would serve as a family picnic area. Thus, the group agreed that Erie would provide picnic tables to the Town of Malone for the park and would remove the picnic amenities at the Chasm Falls Recreation Area.

Recreation use at the project is well below capacity and is not expected to surpass its limits in the near future. Through the relicensing process and the development of the RMP, Erie consulted with local stakeholders and agencies. Erie has agreed to implement the recreational enhancements agreed to by the settling parties as described above. These measures would benefit the public. There was a recognized and agreed-upon need for specific signage at multiple locations in order to provide a safer recreation experience. The proposals for signage at the varying locations throughout the project would enhance the user's experience. The signs would provide guidance for the appropriate places to park, how to access the river, and restricted places near the project to be avoided. The access, facilities, and signage proposed for the recreation areas are adequate for the amount of use at the project.

3.3.5 Land Use and Aesthetics

3.3.5.1 Affected Environment

Land Use

Residential land use in the region is concentrated in and around the Village of Malone, downstream from the project. The highest concentrations of residential development are found in the areas just north of the Village of Malone along Lower Park Road and State Route 30, and along the Duane Street (Salmon River) corridor south of the village through Whippleville to Chasm Falls. Residential development decreases with distance from the village, and the project vicinity is characterized by rural development with scattered year-round residences and summer camps. There is very little commercial or industrial land use in the vicinity of the project. A sand and gravel mine operated by Titus Mountain Sand & Gravel is located approximately 1 RM downstream from the project near the intersection of Johnson Road and County Route (CR) 25 in the Town of Malone. The Titus Mountain Ski Center is also located downstream from the project and west of the Salmon River. Other scattered commercial businesses such as auto repair shops are located in the project vicinity. The density of industrial and commercial development increases with proximity to the U.S. Route 11 corridor in the Town of Malone.

Public lands in the vicinity of the project include forested land managed by the New York DEC for forest production and recreation. These New York DEC-managed lands include the Titusville Mountain State Forest, which is located adjacent to the project's impoundment. Other public land uses in the vicinity of the project include the

Village of Malone's water supply facility located near the project's tailrace. The village obtains its water supply indirectly from Cold Spring Brook, a tributary that joins the Salmon River just downstream of the confluence of the project's tailrace and bypassed reach. A portion of this water supply is held in a 1.0-million-gallon-capacity reservoir near the mouth of Cold Spring Brook.

Crop and pastureland increases downstream from the project as the Salmon River flows through the Village of Malone and into the Upper St. Lawrence River Valley and the St. Lawrence lowlands. Agricultural land is concentrated to the east of the Village of Malone and in the Franklin County Agricultural District west of the village.

Aesthetics

The Chasm Project is located within the Northern and Western Adirondack Foothills, a region characterized by ridges and mountains of low to moderate relief, and a network of intersecting glacial outwash channels that wind among low hills, scattered with lakes and wetlands. Elevations across the Northern and Western Adirondack Foothills generally range from 750 to 2,000 feet, although isolated mountains within the region range from 2,800 to 3,300 feet. Local relief is between 75 and 600 feet.

The project is located along the CR 25 corridor, which serves as a minor byway through the area and is used by seasonal recreation users passing from U.S. Route 11 and the Town of Malone to the Central Adirondack Region. From the Village of Malone, CR 25 follows the river valley south and offers scenic views of the Salmon River. As CR 25 approaches the Chasm dam, it gains elevation quickly, following the natural topography of the landscape. The best view of the dam and immediate upstream and downstream areas is from Fayette Road, which crosses the Chasm impoundment upstream from the dam and intake structure and intersects with CR 25 on the east side of the Salmon River. With the exception of the views offered from the vantage point of the Fayette Road Bridge, the project's facilities and the impoundment are largely screened from view by dense vegetation and forest cover common in the Adirondack region. Scenic intrusions and topographical alterations resulting from original project construction have long since disappeared, and the project area has become integrated with the environmental and visual setting of the surrounding area.

3.3.5.2 Environmental Effects

Erie did not propose any measures relating to land use or aesthetics at the project. No agency or stakeholder recommended any measures relating to land use or aesthetics.

Staff Analysis

There is no construction proposed or new facilities to be added within the project boundary. Decreases in impoundment fluctuation and seasonal increases in flow releases to the bypassed reach as proposed by Erie and included in the Settlement Agreement would result in minor improvements to aesthetics, although the small magnitude of these changes may not be noticeable to the general public. Recreation access sites will be improved with signage, but these enhancements would not result in a major change to land use or aesthetics. There are no other alterations or additions related to land use or aesthetics.

Because the project and its operation would be similar to that occurring under the existing license, we have not identified a need for additional land use or aesthetics mitigation or enhancement measures at the Chasm Project.

3.3.6 Cultural Resources

3.3.6.1 Affected Environment

Area of Potential Effects

Section 106 of the NHPA of 1966, as amended, requires that the Commission evaluate the potential effects of continued operation of the project on properties listed or eligible for listing on the National Register. Such properties listed, or eligible for listing, in the National Register are called historic properties. In this case, the Commission must take into account whether any historic property could be affected within the project's area of potential effects (APE). The APE is defined as 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. We define the APE for the Chasm Project as: (1) lands enclosed by the project boundary, and (2) lands or properties adjoining the project boundary, where the authorized project uses may cause changes in the character or use of historic properties, if historic properties exist.

History of the Region

The Chasm Falls area is not known to have been occupied or heavily used by Native Americans prior to European contact. There are no known reported sites in the area, and generally pre-contact archeological sites are more common in lower elevation areas, particularly north of Malone along the Salmon River, as it nears the St. Lawrence River (Hartgen 2013). Since the 1830s, the project has been used for saw mills, pulp mills, and hydroelectric generation. The remains of a late 19th century pulp mill are

located along the bypassed reach. The earlier saw mills have been destroyed or obscured by the later development (Hartgen 2013).

Historic and Archaeological Resources

As part of its cultural resources study, Erie completed a Phase IA Literature Review and Archaeological Sensitivity Assessment (Phase IA Study) of the APE. The background literature review did not identify any previously reported archeological resources or properties listed in or determined eligible for inclusion in the National Register within a 1-mile radius of the project. However, in 2011, through fieldwork, Erie identified a previously unreported historic period archeological site within the APE. The Adirondack Pulp Mill Site is located along the project's bypassed reach; it consists of the remnants of a former saw mill that was later converted to a pulp mill. The site dates to the late 19th century and includes a stonework foundation, a large stone-arched culvert (part of the former headrace), and scattered millstones that once served as the pulp mill's mechanical grinders. Archeological remnants of a silo or storage bin related to construction of the Chasm Project were also identified within the APE.

The Chasm Project was first placed in service in 1913. Extensive alterations to the powerhouse and other project facilities have occurred in the past 20 years including the removal of the original parapet and associated stone detailing, the rebuilding of the upper portion of each exterior wall at the powerhouse, replacement of the original powerhouse roof, and replacement of the original windows with metal-framed windows.

Erie concludes that the project's facilities are ineligible for the National Register due to the substantial alterations which have removed character-defining features of the project. Other architectural features of the project that were identified include a pair of cobblestone gateposts, a cobblestone springhouse, and a man-made pond located outside of the project boundary. These structures were constructed in association with the project's facilities, and were related to recreational use of the project. These structures have also been modified over the past 90 years and Erie concludes that the architectural structures do not meet the criteria for National Register eligibility.

3.3.6.2 Environmental Effects

To protect cultural resources at the project, Erie proposes to implement its Historic Properties Management Plan, filed with the Commission on October 14, 2014.

Erie was designated the Commission's non-federal representative to initiate section 106 consultation with the New York SHPO in a notice issued on August 13, 2010. As part of the relicensing process, Erie completed a cultural resources study which included the Phase IA Study. The Phase IA Study identified the Adirondack

Pulp Mill Site as potentially eligible for inclusion in the National Register. No on-going project-related effects were identified; however, continued operation of the project could have the potential to adversely affect this site. Potential effects may result from project operation, recreation activities, potential project enhancement measures, and routine maintenance activities.

Erie's license application contained a March 21, 2013 letter from the St. Regis Mohawk Tribe stating that the Chasm Project had "No Effect" in regards to cultural properties of concern to the tribe. The letter also requested that the tribe be immediately contacted in the event any inadvertent discoveries of human remains, funerary objects, sacred objects, and objects of cultural patrimony were made at the project.

The license application also contained a March 29, 2013 letter from the New York SHPO, agreeing with the findings of the Phase IA study, and stating that no further archeological work was requested at the time, and that Erie should complete an HPMP. The New York SHPO stated that it would review the plan when it was completed.

On December 27, 2013, Erie filed a draft HPMP with the Commission, which included a record of consultation with the New York SHPO, the St. Regis Mohawk Tribe, and the National Park Service. The draft HPMP included measures for the management of the Adirondack Pulp Mill Site within the APE, and procedures for treating unanticipated discoveries of archaeological materials or human remains. The draft HPMP also included protocols for proposed future actions, as well as implementation measures that include designation of an HPMP coordinator, training requirements, standards for cultural resources investigations, requirements regarding the use of qualified cultural resources professionals, and a dispute resolution process.

On October 14, 2014, Erie filed its final HPMP with the Commission. Included in that filing was a letter dated February 6, 2014 from the New York SHPO requesting Erie revise the Human Remains Discovery Protocol contained in the draft HPMP to indicate that human remains or funerary objects should not be photographed without first consulting with the St. Regis Mohawk Tribe. The October 14, 2014 filing also contained the New York SHPO's September 23, 2014 comment letter on Erie's revised draft HPMP, which stated the New York SHPO had no issues or concerns with the proposed HPMP.

Staff Analysis

During the Phase IA Study, Erie identified one site, the Adirondack Pulp Mill Site, which has the potential to be listed in the National Register and to be affected by project operation. All other sites previously associated with the project including the powerhouse site were altered in ways that preclude them from being eligible for listing

in the National Register. In order to protect the Adirondack Pulp Mill Site, the New York SHPO requested that Erie develop and implement an HPMP. Through consultation with the New York SHPO, the St. Regis Mohawk Tribe, and the National Park Service, Erie developed an HPMP that directs Erie's management of historic and cultural properties within the APE; it also includes measures to avoid, minimize, or mitigate adverse effects to historic and cultural properties. Throughout the life of any license issued, Erie should continue to consult with the New York SHPO and the St. Regis Mohawk Tribe regarding any future discoveries or disturbances to historic or cultural resources.

To meet its requirements under section 106, the Commission intends to execute a programmatic agreement (PA) for the protection of historic properties from the effects of the operation and maintenance of the Chasm Project. The terms of the PA would ensure that Erie addresses and treats all historic properties identified within the project's APE through implementation of the HPMP filed October 14, 2014. Implementation of the HPMP for the Chasm Project in consultation with the New York SHPO would ensure that adverse effects on historic properties would be appropriately resolved in accordance with section 106 of the NHPA.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the Chasm Project's use of the flow of the Salmon 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.*,²³ 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

²³ See *Mead Corporation, Publishing Paper Division*, 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.

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

Table 12 summarizes the assumptions and economic information we use in our analysis. This information was provided by Erie in the license application. We find that the values provided by Erie are reasonable for the purposes of our analysis. Cost items common to all action alternatives include taxes and insurance costs; net investment (the total investment in power plant facilities remaining to be depreciated); estimated future capital investment required to maintain and extend the life of plant equipment and facilities; normal operation and maintenance cost; and Commission fees.

Table 12. Parameters for the economic analysis of the Chasm Project (Source: Erie and staff).

Parameter	Value
Period of analysis (years) ^a	30
Federal income tax rate (%) ^b	34
State and local tax rate (%) ^d	119,850
Estimated first year of operation ^c	2015
Project cost (\$) ^d	5,569,000
Cost of developing FERC license application (\$) ^d	655,000
Operation and maintenance (\$/year) ^d	262,360
Alternative energy value (\$/MWh) ^e	49.29
Dependable Capacity value (\$/kW-year)	165
Interest rate (%) ^b	8.0
Discount rate (%) ^f	8.0
Installed Capacity (MW)	3.35
Average Annual Generation (MWh)	20,847
Dependable Capacity (kW) – under current license	450
– as described in the license application	300

^a Regardless of the potential license term (30, 40, or 50 years), consistent with Mead, we perform a 30-year economic analysis.

^b Estimated by staff..

^c Consistent with Mead, for a constructed project, the first year of the analysis is the year the project is expected to be licensed.

^d Provided by Erie.

^e Consistent with Mead, the value of energy is based on the current energy values. Alternative energy value is based on an average of the average monthly value for the past year (May 2014 to April 2015) obtained from the New York Independent System Operator Monthly Report dated April 2015. See: http://www.nyiso.com/public/webdocs/markets_operations/documents/Studies_and_Reports/Reports/Monthly_Reports/2015/Board%20Monthly%20Report%20April%202015.pdf.

^f Assumed by staff to be the same as the interest rate.

4.2 COMPARISON OF ALTERNATIVES

Table 13 compares 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 the two action alternatives considered in this EA: Erie's proposal and the staff alternative.

Table 13. Summary of the annual power values and annual production costs for the action alternatives for the Chasm Project (Source: Staff).

	No Action	Erie's Proposal	Staff Alternative
Installed capacity (MW)	3.35	3.35	3.35
Annual generation (MWh)	20,847	20,300 ¹	20,300 ¹
Dependable Capacity (kW)	450	300	300
Annual cost of alternative power (\$/MWh)	\$1,089,256 (52.25)	\$1,037,939 (51.13)	\$1,037,939 (51.13)
Annual project cost (\$/MWh)	\$949,581 (45.55)	\$945,980 (46.60)	\$945,980 (46.60)
Difference between cost of alternative power and project power (\$/MWh)	\$139,675 (6.70)	\$91,959 (4.53)	\$91,959 (4.53)

¹ The generation was reduced as a result of the increased minimum flow releases to the bypassed reach.

4.2.1 No Action

Under the no-action alternative, the project would continue to operate as it does now. The project would have an installed capacity of 3.35 MW, and generate an average of 20,847 MWh of electricity annually with a dependable capacity of 450 kW. The average annual power value of the project would be \$1,089,256, or about \$52.25/MWh. In total, the average annual cost of producing power would be \$949,581, or about \$45.55/MWh. Overall, the project would produce power at a cost which is \$139,675, or \$6.70/MWh, less than the cost of alternative power.

4.2.2 Erie's Proposal

Erie proposes to continue to operate a project that has an installed capacity of 3.35 MW, and generates an average of 20,300 MWh of electricity annually with a dependable capacity of 300 kW. The average annual power value of the project would be \$1,037,939, or about \$51.13/MWh. In total, the average annual cost of producing power would be \$945,980, or about \$46.60/MWh. Overall, the project would produce power at a cost which is \$91,959, or \$4.53/MWh, less than the cost of alternative power.

4.2.3 Staff Alternative

The staff alternative includes the same development proposal as Erie and, therefore, would have the same capacity and energy attributes. Table 12 compares the cost of the no action alternative, Erie's proposal, and the Staff Alternative.

Based on a total installed capacity of 3.35 MW, an average annual generation of 20,300 MWh, and a dependable capacity of 300 kW, the project would have an average annual power value of \$1,037,939, or about \$51.135/MWh. The average annual cost of producing power would be \$945,980, or about \$46.60/MWh. Overall, the project would produce power at a cost which is \$91,959, or \$4.53MWh, less than the cost of alternative power.

4.3 COST OF ENVIRONMENTAL MEASURES

Table 14 shows the cost of each of the environmental enhancement measures considered in our analysis. 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 14. Cost of environmental mitigation and enhancement measures considered in assessing the environmental effects of the Chasm Project (Source: Erie and staff).

Enhancement/Mitigation Measures	Entities	Capital Cost (\$)	Annual Cost (\$)	Levelized Annual Cost (\$)
Aquatic Resources				
1. Implement the Sediment Management Plan, filed July 5, 2012, to allow controlled release of sediments deposited within the project impoundment.	Erie, Staff, Interior, New York DEC	20,000	10,000	7,760
2. Maintain the impoundment water level within 0.25 foot of the top of the flashboards, or the crest of the spillway (if the flashboards are not installed) when river flow is 85 cfs or more and within 0.1 foot of the flashboards or spillway crest when river flow is less than 85 cfs. ¹	Erie, Staff, Settling Parties	0	0	0
3. Provide a base flow of 70 cfs in the Salmon River below its confluence with the powerhouse tailrace, or flow equal to impoundment inflow, whichever is less. ²	Erie, Staff, Settling Parties	0	0	0

Enhancement/Mitigation Measures	Entities	Capital Cost (\$)	Annual Cost (\$)	Levelized Annual Cost (\$)
4. Provide a minimum flow to the bypassed reach (as measured immediately below the dam) of 15 cfs from May 1 through October 1, and 23 cfs from October 2 through April 30, or inflow to the impoundment, whichever is less.	Erie, Staff, Settling Parties	15,100	0	87,030 ³
5. Maintain trash racks on the project's intake with 1-inch clear spacing on a year-round basis. ⁴	Erie, Staff, Settling Parties	0	0	0
6. Develop and implement a streamflow and water level monitoring plan to verify impoundment water levels, minimum bypassed reach flows, and base flows.	Erie, Staff, Settling Parties	15,000	1,000	1,530
Terrestrial Resources				
7. Implement the Invasive Species Management Plan to prevent the introduction and spread of invasive species during construction, maintenance, and operational activities.	Erie, Staff, Settling Parties	0	2,500	1,650

Enhancement/Mitigation Measures	Entities	Capital Cost (\$)	Annual Cost (\$)	Levelized Annual Cost (\$)
Recreation Resources				
8. Within 2 years of license issuance, implement the recreational enhancement measures identified in the Recreation Management Plan appended to the Settlement Agreement.	Erie, Staff, Settling Parties	8,000	500	790
Cultural Resources				
9. Implement the Historic Properties Management Plan filed on October 14, 2014	Erie, Staff	5,000	1,500	1.280

- 1 Because Erie already maintains the impoundment within a narrow band, there is no cost associated with this measure.
- 2 Because Erie already maintains a 70-cfs base flow, there is no cost associated with this measure.
- 3 The levelized annual cost is based on replacing 2,173 MWh of power due to the minimum flow released to the bypassed reach and a loss in dependable capacity of 150 kW.
- 4 Because Erie already maintains 1-inch trash racks at the project intake, there is no cost associated with this measure.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) 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 licensing the Chasm Project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

5.1.1 Recommended Alternative

Based on our independent review and evaluation of the environmental and economic effects of no action, the proposed action, and the proposed action with staff-recommended measures (staff alternative), we recommend the staff alternative.

We recommend this alternative because: (1) the project would provide a dependable source of electrical energy for the region (an estimated 20,300 MWh annually); (2) the 3.35 MW of electric capacity comes from a renewable resource that does not contribute to atmospheric pollution; (3) the public benefits of this alternative would exceed those of the no-action alternative; and (4) the environmental measures proposed by Erie, and recommended by staff, would adequately protect and enhance environmental resources affected by the project.

In the following section, we make recommendations as to which environmental measures proposed by Erie or recommended by agencies and other entities should be included in any license issued for the project.

5.1.1.1 Measures Proposed by Erie

Based on our environmental analysis of Erie's proposal, as discussed in section 3, *Environmental Analysis* and the costs discussed in section 4, *Developmental Analysis*, we recommend including the following environmental measures proposed by Erie in any license issued for the Chasm Project:

Aquatic Resources

- Continue to implement the Sediment Management Plan, filed July 5, 2012 and required by the existing license, to allow controlled release of sediments deposited within the project impoundment.
- Provide a minimum flow to the bypassed reach of 15 cfs from May 1 through October 1, and a flow of 23 cfs from October 2 through April 30, or flow equal to impoundment inflow, whichever is less (section 3.3 of the Settlement Agreement).
- Provide a base flow of 70 cfs, or flow equal to impoundment inflow, whichever is less, in the Salmon River below its confluence with the powerhouse tailrace (section 3.2 of the Settlement Agreement).
- Maintain the impoundment water level within 0.25 foot of the top of the flashboards (or the crest of the spillway if the flashboards are not installed) when river flow is 85 cfs or more and within 0.1 foot of the top of the flashboards or spillway crest when river flow is less than 85 cfs tailrace (section 3.1 of the Settlement Agreement).
- Continue to maintain trash racks on the project's intake with 1-inch clear bar spacing to protect fish from entrainment (section 3.4 of the Settlement Agreement).
- Develop and implement a streamflow and water level monitoring plan to verify impoundment water levels, minimum bypassed reach flows, and base flow (section 3.6 of the Settlement Agreement).

Terrestrial Resources

- Implement the Invasive Species Management Plan appended to the Settlement Agreement to prevent the introduction and spread of invasive species during any construction, maintenance, and operational activities (section 3.7 of the Settlement Agreement).

Recreation

- Implement the Recreation Management Plan appended to the Settlement Agreement to: (1) install a footpath at the informal recreation area at the powerhouse; (2) install signage at the informal recreation area; (3) install signage near the powerhouse identifying restricted areas including the upper

bypassed reach, the substation, and the tailrace area; (4) continue to maintain the Chasm Falls Recreational Area as a river access point, but remove existing picnic amenities; (5) provide the Town of Malone a one-time donation of two wooden picnic tables at the William A. King Memorial Park; and (6) install signage at the Chasm dam indicating “No Parking” and directing the public to the upstream New York Department of Environmental Conservation’s Titusville Mountain Access Site (section 3.5 of the Settlement Agreement).

Cultural Resources

- Implement the Historic Properties Management Plan filed on October 14, 2014 to protect cultural resources.

5.1.1.2 Additional Measures Recommended by Staff

Under the staff alternative, the project would include Erie’s proposed measures, as noted above, and the conditions of the New York DEC’s water quality certification.

We discuss the rationale for key measures we are recommending below.

Sediment Management Plan

The Chasm impoundment is partially filled by sand which must be periodically released downstream to allow for continued operation of the project. To accomplish this and in order to protect aquatic resources in the bypassed reach and downstream of the project, Erie proposes to continue to implement the Sediment Management Plan required by its existing license. The plan serves as the guide by which Erie manages and monitors sediments associated with the project and contains approved steps to allow controlled releases of sediments deposited in the project’s impoundment.

The FWS recommends (10(j) recommendation no. 9) and New York DEC requires (WQC condition no. 13) that Erie implement the Sediment Management Plan. In addition, the FWS recommends that Erie consult with the FWS and the New York DEC if Erie proposes to make any changes to the existing plan.

Monitoring conducted pursuant to the plan during the existing license indicates no adverse changes in sediment or aquatic habitat conditions following sediment releases. As such, it appears that sediment from the Chasm Project impoundment is effectively transported and dispersed downstream in a way that minimizes potential impacts of sediment releases on aquatic resources in the Salmon River. If the need for changes to the Sediment Management Plan arises, consultation with the FWS and New York DEC would likely facilitate any modifications to the existing plan and ensure the protection of aquatic resources. As such, we agree that Erie should consult with the agencies as

needed regarding changes to the existing plan. Further, we recommend that Erie continue implementing the Sediment Management Plan filed with the Commission on July 5, 2012 and conclude that the benefits to aquatic resources outweigh the levelized annual cost of \$7,760.

Minimum Bypassed Reach Flow

The minimum flow in the project's 4,800-foot-long bypassed reach may limit the amount of suitable habitat for fish and other aquatic organisms. To ensure the protection of aquatic species and improve habitat conditions during the winter months, Erie proposes to release a continuous minimum flow of 15 cfs (May 1 to October 1) and 23 cfs (October 2 to April 30) into the bypassed reach. Erie would implement this new flow regime within 48 months of license issuance or by October 2, 2019, whichever occurs later. Erie's proposed minimum flow regime constitutes section 3.3 of the Settlement Agreement and would be required by WQC condition no. 9.

The data collected during Erie's Base and Bypass Flow Study indicate that the existing minimum flow of 15 cfs provides adequate habitat to support the growth and survival of fish and macroinvertebrates in the bypassed reach. Other studies such as the macroinvertebrate and fisheries survey indicate the existence of high quality aquatic habitat and a productive fishery under the existing 15-cfs minimum flow regime. However, our analysis indicated that some improvements in macroinvertebrate habitat, brown trout habitat, angling opportunities, and hydraulic conditions for fish spawning and incubation would occur at the proposed winter flow of 23 cfs. Furthermore, Salmon River flows are generally higher from October through April so the relative cost to release additional water to the bypassed reach is lower compared to the summer months when average river flows are lower. As such, we agree with Erie's proposed minimum flow regime for the bypassed reach as specified in the Settlement Agreement and conclude that the benefits to aquatic resources would be worth the levelized annual cost of \$87,030.

Base Flow

Erie currently provides a minimum base flow of 70 cfs, or flow equal to the impoundment inflow, whichever is less, in the Salmon River downstream of the confluence of the project's tailrace with the bypassed reach. To protect aquatic resources downstream of the project under a new license, Erie proposes to maintain the existing base flow of 70 cfs. As evidenced by their execution of the Settlement Agreement, FWS, New York DEC, TU, and the Town of Malone support Erie's proposal regarding base flows. The 70-cfs base flow would be required by WQC condition no. 9.

During the Base and Bypass Flow Study, the FWS, New York DEC, TU, and Erie observed a flow of 70 cfs in the Salmon River downstream of the tailrace's confluence

with the bypassed reach. All team members agreed that 70 cfs was adequate for aquatic resources in this section of the Salmon River and determined that no further information was needed at that time. We agree and recommend that Erie maintain the base flow as proposed. Since Erie currently maintains a 70-cfs base flow, there would be no cost associated with this measure.

Impoundment Fluctuation

In the event of a powerhouse outage when impoundment water level is below the spillway crest, the 70-cfs base flow provided downstream of the powerhouse would be interrupted until spillage occurs or the turbines are restarted. In order to reduce the duration of base flow interruption resulting from powerhouse outages, Erie proposes to maintain near-crest water levels in the impoundment so that spill would occur quickly and base flow would be restored. Specifically, Erie would make a good faith effort to maintain impoundment water levels within 0.25 foot as measured in a downward direction from the spillway crest (or top of the crest control device when installed) when inflow to the impoundment is more than 85 cfs and within 0.1 foot when inflow to the impoundment is below 85 cfs (section 3.1 of the Settlement Agreement). The Settlement Agreement also provides that impoundment levels 0.5 foot below the spillway crest, (or top of flashboards, if installed) or more be considered a violation of normal operation. As evidenced by their execution of the Settlement Agreement, FWS, New York DEC, TU, and the Town of Malone support Erie's proposed impoundment fluctuation limits. Erie's proposed impoundment fluctuation measure would be required by WQC condition no. 11.

In the event of a powerhouse outage when there is no spill at Chasm dam, the Salmon River would receive the bypassed reach flow, discharge from Cold Spring Brook, and drainage from the powerhouse tailrace. This total flow should be adequate to sustain aquatic life in pools and most sections of the channel for several hours, but some habitat and aquatic organisms could be stranded. If Erie maintains near-crest water levels in the impoundment as proposed, base flow would be restored more quickly relative to the existing condition. Based on our analysis of impoundment refill rates, maintaining near-crest water levels would substantially reduce impoundment refill times and protect downstream aquatic resources in the event of a powerhouse outage. As such, we recommend Erie maintain water level in the impoundment as proposed and conclude there is no cost associated with this measure, since Erie already operates the project in a narrow band.

Streamflow and Water Level Monitoring Plan

Erie proposes to develop a stream flow and water level monitoring plan in consultation with the FWS and New York DEC that would permit independent verification of impoundment water levels, flow in the bypassed reach, and base flow

downstream of the project. Erie proposes to complete the stream flow and water level monitoring plan within 24 months of license issuance. All necessary equipment would be operational and calibrated within 36 months of license issuance. The plan would contain provisions for the installation of binary staff gages to allow for independent verification of impoundment water level, bypass flow, and tailrace base flow. Erie would also establish a public website that provides daily flow information associated with the Salmon River downstream of the project. In addition, Erie would maintain accurate records of water level elevations in the impoundment and project flows that would be made available to the New York DEC upon request. As evidenced by their execution of the Settlement Agreement, the FWS, New York DEC, TU, and the Town of Malone support Erie's proposal to develop this plan. The plan would be required by WQC condition no. 11.

Implementation of a monitoring plan would allow independent verification of water level in the impoundment, bypassed reach flow, base flow, and total Salmon River flow downstream of the project. As such, Erie's proposal would provide a means to monitor project operation and make adjustments as necessary to ensure the protection of aquatic resources. Therefore, we recommend Erie develop and implement the proposed stream flow and water level monitoring plan and conclude this plan is worth the levelized annual cost of \$1,530.

Trash Racks

The powerhouse intake has the potential to affect the impoundment fishery by entraining fish or impinging fish against the trash rack, resulting in fish injury or mortality. To reduce entrainment and impingement of fishes, Erie proposes to maintain the existing configuration of the trash racks with 1-inch clear bar spacing. As evidenced by their execution of the Settlement Agreement, the FWS, New York DEC, TU, and the Town of Malone support Erie's proposal to maintain trash racks with 1-inch spacing. This measure would be required by WQC condition no. 12.

The low intake velocities calculated for the Chasm Project are generally well below the swim speeds needed for escape by most life stages of fish species present in the impoundment. The narrow clear bar spacing, coupled with the low intake velocities, limits the number of fish expected to become entrained through the project and should adequately protect the fishery in the impoundment. As such, we recommend Erie maintain the trash racks as proposed. Because Erie already maintains trash racks with 1-inch clear bar spacing, there is no cost associated with this measure.

Invasive Species Management Plan

The Invasive Species Management Plan appended to the Settlement Agreement includes measures to prevent the introduction and spread of invasive species during

construction, maintenance, and operational activities. Although no invasive species are currently associated with the project, should a license be granted, the Invasive Species Management Plan would be beneficial to help prevent the introduction of invasive species to the project due to disturbance caused by future construction or maintenance activities. As evidenced by their execution of the Settlement Agreement, the FWS, New York DEC, TU, and the Town of Malone support Erie's the proposed plan. Implementation of the plan would be required by WQC condition no. 14.

The Invasive Species Management Plan would require Erie to comply with New York DEC recommended measures for preventing the introduction and spread of aquatic invasive species such as inspecting for and removing any aquatic vegetation found on boating equipment when conducting in-water work for daily operations and routine maintenance. The plan also requires Erie to inspect and remove any vegetation from construction equipment, refrain from planting invasive terrestrial plants, and utilize only weed-free seed, straw, soil amendments, gravel fill, or mulch. Further, the plan requires Erie to monitor any areas disturbed by construction or maintenance activities for invasive species and to treat them in the first full growing season. The plan also contains a provision for New York DEC to install and maintain an invasive species disposal station and educational signage at the New York DEC's Titus Mountain boat launch, located about 3,000 feet upstream of the dam.²⁴ Implementing the Invasive Species Management Plan would help prevent the introduction and spread of invasive species due to disturbance caused by future activities over the term of a new license and the benefits are worth the levelized annual cost of \$1,650.

Recreation Management Plan

Erie conducted recreation stakeholder consultation and reached an agreement with the parties involved on the measures to be included in a recreation management plan. Currently, the project lacks directional signage. Erie's proposal for directional signage would inform the user where access to the impoundment and bypassed reach is allowed or prohibited. Additionally, visitors to the project would be directed to where parking is or is not allowed. Therefore, additional signage would be an enhancement to the project.

Erie's plan incorporates a new footpath at the informal access site near the powerhouse, signage improvements, parameters for continued maintenance of the Chasm Falls Recreation Area, and a one-time donation of two picnic tables to the Town of Malone. These measures would provide adequate recreation enhancements to the project for the benefit of the public. Implementation of the measures included in the Recreation

²⁴ Should the plan be approved in a license, the Commission would not be able to ensure compliance with any provision of the plan that imposes requirements on an entity other than the licensee.

Management Plan would enhance the recreational user experience at the project and be worth the estimated levelized annual cost of \$790.

Historic Properties Management Plan

Erie identified the Adirondack Pulp Mill Site as potentially eligible for inclusion in the National Register. No other historic or archeological resources listed in, previously determined to be eligible for, or recommended as eligible for inclusion in the National Register were identified within the APE. The New York SHPO requested that Erie complete an HPMP. On October 14, 2014, Erie filed its final HPMP, which was approved by the New York SHPO on September 23, 2014. The HPMP provides background information on cultural resources at the project, including maps of the APE and any archeological site(s), preservation goals and priorities, project effects, mitigation measures, implementation procedures, and a list of activities that do not require prior consultation with the SHPO. Implementation of the HPMP would ensure that any adverse effects on National Register eligible components of the project would be properly identified and resolved through consultation with the New York SHPO and the St. Regis Mohawk Tribe. To ensure that effects on eligible historic properties, and to any as-yet unidentified archeological resources, are satisfactorily resolved over the term of any new license, we intend to execute a PA with the New York SHPO. The PA would require Erie to implement any approved HPMP. The annual cost of implementing the HPMP is \$1,280 and we conclude that the benefits of this measure outweigh the costs.

5.2 UNAVOIDABLE ADVERSE EFFECTS

Some fish entrainment and turbine-induced mortality would occur despite low intake velocities and trash racks with 1-inch clear bar spacing. We expect the long-term impact of entrainment to be minimal because only small fish could pass through the trash racks and larger fish would remain in the impoundment.

5.3 FISH AND WILDLIFE AGENCY RECOMMENDATIONS

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by the federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project.

Section 10(j) of the FPA states that whenever the Commission finds that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of the agency.

In response to the Commission's Ready for Environmental Analysis notice, Interior, in a letter filed July 14, 2014, recommended 10 fish and wildlife measures under section 10(j). Subsequently, as noted previously, Erie, Interior's FWS, and other parties executed a Settlement Agreement to address various issues associated with issuance of a new license for the project, including impoundment fluctuation, base flows, bypassed reach flows, fish protection and passage, recreational enhancements, stream flow and water level monitoring, and invasive species management.

In its comments on the Settlement Agreement, filed May 20, 2015, FWS stated that the measures in the Settlement Agreement supersede its original 10(j) recommendations, with the exception of the original 10(j) recommendation no. 9 (implement the existing Sediment Management Plan), which was not reflected in the Settlement Agreement.

Table 15 presents Interior's 10(j) recommendations and indicates whether the recommendations are included in the staff alternative. The recommendations reflecting the Settlement Agreement are numbered as they appear in the Settlement Agreement. Recommendation no. 9 is numbered as it was in the original 10(j) recommendations.

Commission Staff makes a preliminary determination that one of the recommendations by Interior, no. 3.5 (Recreation Management Plan) is not within the scope of section 10(j), but we recommend adopting it, as well as all of the other recommendations.

Table 15. Analysis of fish and wildlife agency recommendations for the Chasm Project (Source: staff).

Recommendation	Agency	Within the scope of section 10(j)?	Levelized Annual cost \$	Recommend adopting?
3.1. Limit normal drawdown of impoundment to 0.25 foot when project inflow is 85 cfs or greater and 0.1 foot when inflows are less than 85 cfs.	Interior	Yes	0 ¹	Yes
3.2. Release a base flow downstream of the project of 70 cfs or project inflow, whichever is less.	Interior	Yes	0 ²	Yes
3.3. Release a minimum flow to the bypassed reach of 15 cfs from May 1 through October 1, and 23 cfs from October 2 through April 30, or project inflow, whichever is less.	Interior	Yes	87,030	Yes
3.4. Maintain trash racks with 1-inch clear spacing on the project intake year-round.	Interior	Yes	0 ³	Yes
3.5. Implement the Recreation Management Plan appended to the Settlement Agreement.	Interior	No ⁴	790	Yes
3.6. Develop and implement a stream flow and water level monitoring plan.	Interior	Yes	1,530	Yes
3.7. Implement the Invasive Species Management Plan appended to the Settlement Agreement.	Interior	Yes	1,650	Yes

Recommendation	Agency	Within the scope of section 10(j)?	Levelized Annual cost \$	Recommend adopting?
9. For the protection and enhancement of fish and wildlife, the existing Sediment Management Plan (approved by the FERC on October 10, 2012) shall be incorporated as a license article in any new license issued for this Project. If any changes to this plan are warranted, the Licensee shall consult with the U.S. Fish and Wildlife Service and the New York State Department of Environmental Conservation prior to submitting an application for amendment to the FERC.	Interior	Yes	7,760	Yes

¹ Erie currently maintains the impoundment within a 0.6-foot operating range. There would be no additional costs attributable to the 0.25-inch range.

² Erie currently maintains a 70-cfs base flow

³ Erie currently maintains 1-inch trash racks.

⁴Not a specific measure for the protection, mitigation, or enhancement of fish and wildlife resources that may be affected by the project.

5.4 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA, 16 U.S.C. section 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 a project. We reviewed five comprehensive plans that are applicable to the project. We found no inconsistencies.

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6.0 FINDING OF NO SIGNIFICANT IMPACT

Issuing a new license for the Chasm Project as proposed, with the additional staff-recommended measures, would allow Erie to continue to generate 20,300 MWh of electrical energy from a renewable resource which does not contribute to atmospheric pollution, while providing enhancements to fish and wildlife resources, improvements to recreation facilities, and protection of cultural and historic resources in the project area.

Based on our independent analysis, the issuance of a license for the Chasm Project with our recommended environmental measures would not constitute a major federal action significantly affecting the quality of the human environment.

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8.0 LIST OF PREPARERS

John Mudre—Project Coordinator (Ecologist; Ph.D. Fisheries Science)

Nicholas Ettema – Aquatic Resources (Fisheries Biologist; M.S. Aquatic Ecology)

Timothy Looney – Need for Power and Developmental Analysis (Civil Engineer; B.S. Engineering)

Brandi Sanguinetti –Terrestrial Resources and Threatened and Endangered Species (Ecologist; M.S. Natural Resources and Environmental Science)

Allyson Conner – Recreation, Land Use, Aesthetics, and Cultural Resources (Outdoor Recreation Planner: M.S. Recreation Management)

APPENDIX A: SETTLEMENT AGREEMENT MEASURES

3.0 MEASURES THAT THE PARTIES AGREE SHOULD BE INCORPORATED IN THE TERMS OF THE LICENSE

3.1 Daily Impoundment Fluctuation as Part of Normal Operations

3.1.1 General Agreements

Within 24 months of license issuance or by August 1, 2017, whichever occurs later, the Licensee shall limit daily impoundment fluctuations as part of normal operations, as specified in Table 3-1.

**TABLE 3-1
CHASM HYDROELECTRIC PROJECT NORMAL
IMPOUNDMENT FLUCTUATION**

River Flow (cfs)	Normal Impoundment Fluctuation
85 cfs or greater	0.25-foot measured in a downward direction from top of 2-foot-high crest
Less than 85 cfs	0.1-foot measured in downward direction from top of 2-foot-high crest

1. Although Erie will make a good faith effort to limit normal impoundment fluctuation to 0.25-foot when river flows are equal to or exceed 85 cfs, for the purposes of FERC compliance, only drawdowns greater than 0.5-foot will be reportable. This additional 0.25-foot helps address the natural fluctuations in river flow.
2. An example of a crest control device includes year-round or seasonal flashboards.
3. The Parties agree that the Licensee may continue to install 2-foot-high seasonal flashboards (or equivalent) consistent with current operations. The Licensee has the flexibility to modify the seasonal flashboards to be year-round flashboards or to replace the flashboard with a similar device or devices (e.g., an inflatable crest control device) over the term of the license. The Licensee is not required to provide the Parties with details regarding the schedule for deployment, removal, or a designed failure of the crest control device.

Normal impoundment fluctuations specified in Table 3-1 will be defined as the maximum drawdown limit associated with the operating range necessary to achieve normal operation. The normal impoundment fluctuation limit will be measured in the downward direction from the crest of spillway elevation of 1,283.8 feet or top of crest control device (e.g., flashboards) elevation of 1,285.8 feet when installed. Water surface elevations higher than the elevation from which any downward fluctuation is measured are considered outside of the normal impoundment fluctuation zone, and variations of such elevations are not considered as a utilization of the normal impoundment fluctuation.

The Licensee will at all times make a good faith effort to maintain impoundment fluctuation within 0.25-foot when river flow exceeds 85 cfs. The Parties agree that only when the impoundment drops in excess of 0.5-foot from the top of the 2-foot-high crest control device (when installed), or crest of spillway (when not installed), shall a notification to FERC and the NYSDEC be made.

3.1.2 Emergency Exceptions

Impoundment fluctuation limitations may be curtailed or suspended if required by operating emergencies beyond the control of the Licensee, and for short periods upon prior mutual agreement between the Licensee and NYSDEC. If the requirements of this commitment are so curtailed or suspended, the Licensee shall notify FERC and the NYSDEC as soon as possible, but no later than ten (10) business days after each such incident.

3.1.3 Justification

The Salmon River downstream of the Project supports a high quality wild and stocked trout fishery. The trout, and the invertebrates that provide their primary forage, are dependent upon the free flowing habitat of the Salmon River downstream of the Project. Water levels in the free flowing portions of the river can be quickly altered due to modifications in upstream flow releases. While the mobility of trout and other fish may allow these species to avoid potential dewatering, the much less mobile invertebrate populations can be adversely impacted.

Based on study activities, field observations, and subsequent consultation, the Parties concluded that limiting daily impoundment fluctuations consistent with the levels presented in Table 3-1 would help support the downstream habitat areas in the event of a potential unit trip during non-spill events. Given the Parties' continuous seasonal bypass flows of 15 and 23 cfs (as specified in Section 3.3 below), in combination with flows in the Project's tailrace that would continue to contribute to the downstream base flow following a unit trip, the Parties believe that limiting the Project's impoundment fluctuation consistent with Table 3-1 will help protect the downstream areas through continuing to provide the necessary base flow. Therefore, the Parties determined that, in order to reduce the potential for interruptions in the

Project's downstream 70 cfs base flow (as specified in Section 3.2 below), a reduction of the Project's normal fluctuation limits would be beneficial.

3.2 Base Flows

3.2.1 General Agreements

Upon license issuance, the Licensee shall maintain a base flow of 70 cfs (or inflow to the Chasm impoundment, whichever is less) immediately downstream of the confluence of the Project's bypassed reach and tailrace.

3.2.2 Emergency Exceptions

The requirements of this base flow commitment may be curtailed or suspended if required by operating emergencies beyond the control of the Licensee and for limited periods upon prior mutual agreement between the Licensee and the NYSDEC. If the requirements of this commitment are so curtailed or suspended, the Licensee shall notify FERC and the NYSDEC as soon as possible, but no later than ten (10) business days after each such incident.

3.2.3 Justification

The existing base flow was established during the previous licensing of the Project. The Base Flow Study conducted in support of this current relicensing demonstrated that the existing base flow of 70 cfs fully meets all management goals for the downstream river reach.

3.3 Flow Releases to Bypassed Reach

3.3.1 General Agreements

Upon license issuance, the Licensee shall provide a year-round flow releases to the Project's bypassed reach of 15 cfs (or inflow to the Chasm impoundment, whichever is less). The flow released to the bypassed channel will continue to be provided through an existing penstock tap located immediately downstream of the Project's intake. Within 48 months of

license issuance, or by October 2, 2019, whichever occurs later, the Licensee shall begin providing a flow release to the bypassed channel of 15 cfs from May 1st through October 1st, and a flow release of 23 cfs from October 2nd through April 30th, (or inflow to the Chasm impoundment, whichever is less) with such flow regime continuing for the remainder of 40- year term of the new license.

3.3.2 Emergency Exceptions

The requirements of this flow release to the bypassed reach commitment may be curtailed or suspended if required by operating emergencies beyond the control of the Licensee, and for limited periods upon prior mutual agreement between the Licensee and the NYSDEC. If the requirements of this commitment are so curtailed or suspended, the Licensee shall notify FERC and the NYSDEC as soon as possible, but no later than ten (10) business days after each such incident.

3.3.3 Justification

The Delphi Flow Studies and subsequent consultation conducted as part of the relicensing effort demonstrated that a bypassed reach flow release of 15 cfs from May 1st through October 1st provides the necessary flow to support the habitat and fish species associated with the Chasm bypassed reach. Additional consultation among the Parties determined that a flow release of 23 cfs from October 2nd through April 30th provides the necessary stream flow to support spawning and recreational fishing activities associated with the bypassed reach. The Parties to this Offer of Settlement have agreed that establishment of the proposed flow releases to the Project's bypassed reach was justified by, and is contingent upon, a 40-year (or more) license term associated with the new license.

3.4 Fish Protection and Passage

3.4.1 General Agreements

Over the course of the new license, the Licensee will maintain trashracks with 1-inch clear spacing on a year-round basis.

3.4.2 Reservation of Authority

In addition to the protection measures outlined in this section, the DOI will reserve its authority under Section 18 of the FPA to prescribe additional upstream or downstream fishway facilities in the future. This reservation ensures that adequate facilities for fish passage will be in place should management goals or needs change during the term of the license.

3.4.3 Emergency Exceptions

Fish protection measures may be curtailed or suspended if required by operating emergencies beyond the control of the Licensee, and for limited periods upon prior mutual agreement between the Licensee, the NYSDEC, and the USFWS. If the requirements of this commitment are so curtailed or suspended, the Licensee shall notify FERC, the NYSDEC, and the USFWS as soon as possible, but no later than ten (10) business days after each such incident.

3.4.4 Justification

The use of 1-inch clear spaced trashracks to exclude most adult game fish and other fish from potential entrainment has become the USFWS's standard for hydroelectric facilities located on rivers similar to the Salmon River in New York. This Offer of Settlement does not require the Licensee to monitor or test the effectiveness of any fish protection measures included in this Offer of Settlement.

3.5 Recreational Enhancements

3.5.1 General Agreements

The Licensee has developed a Recreation Management Plan in consultation with the NYSDEC, USFWS, TU, and Town of Malone. A copy of the approved Plan is presented in Appendix A to this Offer of Settlement. In accordance with the Recreation Management Plan, the Licensee will complete the following recreational enhancements within 24 months of license issuance:

- Through the installation of signage and a herd path, formalize the designated fishing areas associated with the lower portion of the Project's bypassed reach.
- Through the installation of signage within the parking lot, formalize a 2 vehicle parking area within the Project's powerhouse parking lot (due to the sensitive nature of this area, no signage will be posted at the road identifying public access).
- Through the installation of signage, clearly identify restricted areas associated with public safety concerns, including the upper bypassed reach, the substation, and the tailrace area.
- Continue to maintain the Chasm Falls Recreational Area, with an emphasis on river access by removing the existing picnic tables.
- Provide the Town of Malone with two wooden picnic tables for the town's William A. King Memorial Park (this will serve as a one-time donation to the park and the Licensee will not be responsible for maintenance or the potential replacement of the picnic tables).
- Install signage near the Project's dam indicating no parking and directing the public to the upstream Titusville Mountain State Forest Salmon River Fishing and Waterway Access Site.

3.5.2 Monitoring

This Offer of Settlement does not require the Licensee to monitor the use of any recreational facilities included in this Offer of Settlement beyond the requirements of FERC Form 80 reporting.

3.5.3 Justification

The Parties agreed to formalize the fishing areas associated with the Project's bypassed reach through the installation of signage, a herd path, and through identification of areas associated with potential public safety concerns. The Parties also agreed that, given the proximity of the existing Chasm Falls Recreation Area and the Town of Malone's William A. King Memorial Park, it would be appropriate for the Licensee's recreation area to focus on providing river access, and for the Town's park to be the central location for picnicking activities along this portion of the river. Thus, the Parties agreed that Licensee should remove the picnic tables from the Chasm Falls Recreation Area and install two picnic tables at the Town of Malone's William A. King Memorial Park.

3.6 Stream Flow and Water Level Monitoring Plan

3.6.1 General Agreements

The Licensee shall develop a Stream Flow and Water Level Monitoring Plan in consultation with the NYSDEC and the USFWS within 24 months of license issuance. The Monitoring Plan shall include all gages and/or equipment to:

- Determine head pond elevation,
- Determine bypass flow,
- Determine tailrace base flow, and
- Provide an appropriate means of independent verification by the NYSDEC and the USFWS.

All staff gages, pins, and ancillary equipment required by the Monitoring Plan, including head pond gages, shall be made operational and calibrated within 36 months of license issuance.

The Monitoring Plan shall contain provisions for the installation of binary staff gages at appropriate locations to permit independent verification of head pond water level, bypass flow, and tailrace base flow. Binary staff gages will be visible to the general public.

Within 36 months of license issuance, as part of the Monitoring Plan, the Licensee shall establish a public website that provides daily flow information associated with the Salmon River downstream of the Chasm Project. The Licensee will provide the address of the web site to the NYSDEC, USFWS, and TU. These Parties may distribute the web site address as deemed appropriate; however, the Licensee will not be responsible for advertising or further dissemination of web site address over the term of the license. The public website will be established and maintained in lieu of any future funding or development of a gaging station on the Salmon River over the 40-year term of the new license.

3.6.2 Record-Keeping

As to be defined in the Stream Flow and Water Level Monitoring Plan, the Licensee shall keep accurate and sufficient records of the impoundment elevation and Project flows. Consistent with similar plans developed in consultation with the NYSDEC, the Licensee anticipates that such data would be provided in spreadsheet format in intervals ranging from 15 minutes to 1 hour and in increments ranging from 0.1 foot to 1 foot. The NYSDEC will provide the Licensee with a contact person to receive such information. All records will be made available for inspection at the Licensee's principal business office within New York State within five (5) business days or will be provided in written form within 30 days of the Licensee's receipt of a written request for such records by the NYSDEC. Furthermore, the Licensee will provide to the NYSDEC the name of a 7-day-per-week contact person to provide immediate verification of monitored flows and responses to questions about abnormal or emergency conditions.

3.6.3 Justification

The NYSDEC and the USFWS have required that flows be verified through stream gaging methods for the initial placement of visual gages and markers for other hydroelectric facilities across New York State. Experience throughout the State has confirmed that the development of a Stream Flow and Water Level Monitoring Plan and the associated gaging and data management activities has proven to be an essential component of a water flow and elevation management program. Such a Plan, and the associated monitoring, provides the tools necessary to verify the water flows and elevations presented in this Offer of Settlement. Aside from providing the agencies with a means to independently monitor flows, the visual gages and markers have proved to be useful to the Licensee as well. The Parties to this Offer of Settlement agree that the public website, in combination with the proposed visual gages, provide the desired recreational and flow information, and thus no further funding of gaging efforts (e.g., USGS gage) by Licensee on the Salmon River is warranted.

3.7 Invasive Species Management Plan

The Licensee has developed an Invasive Species Management Plan in consultation with the NYSDEC and the USFWS. A copy of the approved Plan is presented in Appendix B to this Offer of Settlement. The Plan includes measures to prevent the introduction and/or spread of invasive species during construction, maintenance, and operational activities, as defined by the NYSDEC Office of Invasive Species Coordination.

3.7.1 Justification

Although no invasive species are currently associated with the Project, given the agreed upon 40-year term for the new license, the Parties agreed that the development and implementation of an Invasive Species Management Plan will be beneficial to help prevent the introduction of invasive species to the Project through recreation or construction activities.

APPENDIX B: WATER QUALITY CERTIFICATION



PERMIT
Under the Environmental Conservation Law (ECL)

Permittee and Facility Information

Permit Issued To:

ERIE BOULEVARD HYDROPOWER LP
33 W 1ST ST S
FULTON, NY 13069
(315) 593-3118

Facility:

CHASM FALLS HYDRO FACILITY
CHASM FALLS RD|FERC 7320
MALONE, NY 12953

Facility Location: in MALONE in FRANKLIN COUNTY

Facility Principal Reference Point: NYTM-E: 561.51 NYTM-N: 4955.01

Project Location: Salmon River

Authorized Activity: This Water Quality Certificate authorizes the continued operation and maintenance of the existing Chasm Falls Hydroelectric Project, with a generating capacity of 3.35 MW. This Water Quality Certification is part of a Federal Energy Regulatory Commission (FERC) relicensing, Project # P-7320. The project shall be run in accordance with attached conditions and the applicable provisions of the Chasm Project Settlement Agreement dated April 13, 2015.

Permit Authorizations

Water Quality Certification - Under Section 401 - Clean Water Act

Permit ID 5-1648-00084/00008

(FERC Project No. 7320)

New Permit

Effective Date: 5/19/2015

Expiration Date: See Condition #1

NYSDEC Approval

By acceptance of this permit, the permittee agrees that the permit is contingent upon strict compliance with the ECL, all applicable regulations, and all conditions included as part of this permit.

Permit Administrator: ERIN L BURNS, Deputy Regional Permit Administrator
Address: NYSDEC REGION 5 HEADQUARTERS
1115 NYS ROUTE 86
PO BOX 296
RAY BROOK, NY 12977 -0296

Authorized Signature: _____

Date ____/____/____



Permit Components

NATURAL RESOURCE PERMIT CONDITIONS

WATER QUALITY CERTIFICATION SPECIFIC CONDITION GENERAL

CONDITIONS, APPLY TO ALL AUTHORIZED PERMITS

NOTIFICATION OF OTHER PERMITTEE OBLIGATIONS

NATURAL RESOURCE PERMIT CONDITIONS - Apply to the Following Permits: WATER QUALITY CERTIFICATION

1. Expiration Date The expiration date of this Water Quality Certificate is coincident with the expiration date of the license issued by the Federal Energy Regulatory Commission (FERC) for FERC project #7320.

2. Conformance with Plans All activities authorized by the permit must be in strict conformance with approved plans submitted by the applicant or applicant's agent as part of the permit application and licensing Settlement Agreement.

3. Settlement Agreement This certificate includes and incorporates the Chasm Project Settlement Agreement ("Settlement") dated April 13, 2015, to the extent that the Settlement provides for or requires the certificate holder to comply with New York State water quality standards and the conditions of this certificate.

4. Notification Requirements for Emergencies With the exception of emergency provisions described in the Settlement Agreement, the following procedures shall apply to all activities conducted at the project in response to an emergency:

Prior to commencement of emergency activities, the certificate holder must notify the Department and receive approval in advance of the work commencing. If circumstances require that emergency activities be taken immediately such that prior notice to the Department is not possible, then the Department must be notified by the certificate holder within 24 hours of commencement of the emergency activities. In either case, notification must be by certified mail or other written form of communication, including fax or electronic mail. This notification must be followed within 24 hours by submission of the following information:

- a description of the action;
- location map and plan of the proposed action; and
- reasons why the situation is an emergency.

All notifications, requests for emergency authorizations and information submitted to support such requests shall be sent to the Department contact listed in Permit Condition #15.



5. State May Require Site Restoration If upon the expiration or revocation of this permit, the project hereby authorized has not been completed, the applicant shall, without expense to the State, and to such extent and in such time and manner as the Department of Environmental Conservation may lawfully require, remove all or any portion of the uncompleted structure or fill and restore the site to its former condition. No claim shall be made against the State of New York on account of any such removal or alteration.

6. Precautions Against Contamination of Waters All necessary precautions shall be taken to preclude contamination of any wetland or waterway by suspended solids, sediments, fuels, solvents, lubricants, epoxy coatings, paints, concrete, leachate or any other environmentally deleterious materials associated with the project.

7. State Not Liable for Damage The State of New York shall in no case be liable for any damage or injury to the structure or work herein authorized which may be caused by or result from future operations undertaken by the State for the conservation or improvement of navigation, or for other purposes, and no claim or right to compensation shall accrue from any such damage.

OPERATIONS

8. Base Flows The certificate holder shall maintain a base flow of 70 cfs (or inflow to the impoundment, whichever is less), in accordance with the Settlement, Section 3.2.

9. Bypassed Reach Flow The certificate holder shall maintain a seasonal bypassed reach flow of 15 cfs from May 1 - October 1 and 23 cfs from October 2 - April 30 each year, in accordance with the Settlement, Section 3.3.

10. Flow and Water Level Monitoring The certificate holder shall develop a stream flow and water level monitoring plan consistent with the Settlement, Section 3.6.

11. Impoundment Fluctuations The project reservoir shall be operated in accordance with the Settlement, Section 3.1. Alternate impoundment operating plans must be reviewed and approved by the Department prior to being implemented. Emergencies shall be dealt with in accordance with Permit Condition #4 of this Certificate.

12. Fish Protection and Passage The certificate holder will maintain fish protection and passage provisions in accordance with the Settlement, Section 3.4.

13. Sediment Management The certificate holder shall manage sediments in accordance with the Department-approved Sediment Management Plan, dated May 25, 2011, and any subsequent updated versions over the course of the FERC license period. The conditions associated with the construction and maintenance section below do not apply to this sediment management plan condition.

14. Invasive Species Management The licensee will prevent the introduction and/or spread of invasive species in accordance with the Invasive Species Management Plan referenced in the Settlement, Section 3.7.



CONSTRUCTION AND MAINTENANCE REQUIREMENTS

15. Department Contact for Project Maintenance and Construction All matters pertaining to project maintenance and construction work affecting water quality, compliance with water quality standards, and this certificate shall be addressed to:

Regional Permit Administrator
New York State Department of Environmental Conservation
1115 Route 86, PO Box 296
Ray Brook, NY 12977-0296

16. Notifications The Regional Permit Administrator must be notified in writing at least 60 days prior to commencing any project maintenance or construction work pertaining to water quality, compliance with water quality standards or this certificate.

17. Prohibition Period for Trout All instream work, as well as any work that may result in the suspension of sediment, is prohibited during the trout spawning and incubation period commencing October 1 and ending April 30, unless project-specific approval is granted by the Department.

18. Maintenance Dredging The certificate holder shall install and maintain appropriate turbidity control structures while conducting any maintenance dredging activities associated with the Project. At least 60 days prior to maintenance dredging, the certificate holder shall notify the Department of the details of the dredging operations and provide details of the environmental controls to be used to minimize sediment and turbidity releases downstream of the work, along with the disposal location.

19. Sediment Analysis and Disposal The certificate holder shall notify the Department at least 60 days prior to sediment dredging or disturbance of the proposed activity in order for the Department to determine whether sediment sampling and analysis is necessary. If deemed necessary, the certificate holder shall sample any sediments to be disturbed or removed from the project's waters and test them for contaminants. Sampling and testing shall be accomplished according to a protocol that is consistent with the Department's Technical and Operations Guidance (TOGS) 5.1.9 or applicable guidelines/regulations. The sampling protocol shall include a disposal protocol based on analytical sediment sampling results and current applicable regulations/guidelines. The sampling results are required to be submitted to the Department at least 45 days prior to the commencement of dredging or work that will disturb sediment in the project waters. Dredging or other excavation can not commence until the certificate holder also secures the Department's approval for the disposal or interim holding locations for any sediments to be removed from the project waters.

20. Construction Drawdowns Whenever construction and/or maintenance activities require that the water level of project reservoirs be lowered, it shall not be drawn down more than 1 foot per hour. During refill, the water level of the impoundment shall not be allowed to rise more than 1 foot per hour. Baseflow requirements below the Chasm Project (70 cfs unless inflow to the impoundment is less than 70 cfs, in which case the outflow from the Chasm Project will be equal to inflow to the impoundment, as specified in Section 3.2 of the Settlement) is to be maintained during all impoundment drawdowns and refills.



21. Cofferdams, Access Roads, or other Structures on River Bank Placement of cofferdams, construction of temporary access roads or ramps, or other temporary structures which encroach upon the bed or banks of the Salmon River or project reservoir: The proposed design of all such structures as they pertain to water quality, compliance with water quality standards, and this certificate must be approved by the Department prior to installation. The Department will conduct its review of the proposed design within 60 days after receipt of all materials it determines are necessary for completing such review.

22. Erosion and Sediment Control The certificate holder shall ensure that the following erosion and sediment/contaminant control measures, at a minimum, are adhered to during routine maintenance and construction that may result in sediments/contaminants entering any wetland or waterbody:

- Isolate in-stream work from the flow of water and prevent discolored (turbid) discharges and sediments caused by excavation, dewatering and construction activities from entering any waterbody or wetland.
- Exclude the use of heavy construction equipment below the mean high water line until the work area is protected by an approved structure and dewatered.
- Stabilize any disturbed banks by grading to an appropriate slope, followed by armoring or vegetating as appropriate, to prevent erosion and sedimentation into any waterbody or wetland.
- Minimize soil disturbance, provide appropriate grading and temporary and permanent re-vegetation of stockpiles and other disturbed areas to minimize erosion/sedimentation potential.
- Protect all waters from contamination by deleterious materials such as wet concrete, gasoline, solvents, epoxy resins or other materials used in the construction, maintenance and operation of the project.
- Install effective erosion control measures on the downslope of all disturbed areas to prevent eroded material from entering any waterbody or wetland. Erosion control measures must be maintained in a fully functional condition until the disturbed areas are fully stabilized. These erosion control measures are to be installed before commencing any other activities involving soil disturbance.
- Ensure complete removal of all dredged and excavated material, debris or excess materials from construction, from the bed and banks of all water areas to an approved upland disposal site.
- Ensure that all temporary fill and other materials placed in the waters of the river are completely removed, immediately upon completion of construction, unless otherwise directed by the Department.



23. Turbidity Monitoring During routine maintenance or construction related activities in or near the Salmon River or project reservoir, the certificate holder will visually monitor the waters of the river at a point no more than 200 feet downstream of the worksite to ensure there is no substantial visible contrast to natural conditions as observed upstream of the worksite. If there is a substantial visible contrast to natural conditions caused by the work, the certificate holder shall take appropriate actions to prevent further turbidity exceedence of the applicable 6NYCRR Part 703 turbidity water quality standard. The certificate holder shall also notify the Department within 24 hours of a turbidity exceedence and the actions taken to correct the exceedence.

24. Maintenance of River Flows During all periods of maintenance and/or construction activity, the certificate holder shall continuously maintain adequate flows immediately downstream of the work site consistent with the provisions of this certificate. If adequate river flows are not maintained, the certificate holder is required to notify the Department's Region 5 office in Ray Brook, within 24 hours of the incident.

25. Stormwater SPDES All activities at the project proposing ground disturbance greater than one acre must obtain coverage under the SPDES General Permit for Stormwater Discharges from Construction Activities (GP-0-15-002).

WATER QUALITY CERTIFICATION SPECIFIC CONDITIONS

1. Water Quality Certification The New York State Department of Environmental Conservation hereby certifies:

- The Department has reviewed the certificate holder's Application for Federal Hydroelectric License (hereafter referred to as "the Application") and all other available pertinent information, including the Settlement;
- The project will comply with Sections 301, 302, 303, 306 and 307 of the Federal Water Pollution Control Act as amended and as implemented by the limitations, standards and criteria of the state statutory and regulatory requirements set forth in 6NYCRR Section 608.9(a); and
- The project will comply with applicable New York State effluent limitations, water quality standards and thermal discharge criteria set forth in 6NYCRR Parts 700-706.

This Water Quality Certificate is issued pursuant to Section 401 of the Federal Water Pollution Control Act (33 USC 1341).

GENERAL CONDITIONS - Apply to ALL Authorized Permits:

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



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

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

2. Relationship of this Permit to Other Department Orders and Determinations Unless expressly provided for by the Department, issuance of this permit does not modify, supersede or rescind any order or determination previously issued by the Department or any of the terms, conditions or requirements contained in such order or determination.

3. Applications For Permit Renewals, Modifications or Transfers The permittee must submit a separate written application to the Department for permit renewal, modification or transfer of this permit. Such application must include any forms or supplemental information the Department requires. Any renewal, modification or transfer granted by the Department must be in writing. Submission of applications for permit renewal, modification or transfer are to be submitted to:

Regional Permit Administrator
NYSDEC REGION 5 HEADQUARTERS
1115 NYS ROUTE 86
PO BOX 296
RAY BROOK, NY 12977 -0296

4. Submission of Renewal Application The permittee must submit a renewal application at least 30 days before permit expiration for the following permit authorizations: Water Quality Certification.

5. Permit Modifications, Suspensions and Revocations by the Department The Department reserves the right to exercise all available authority to modify, suspend or revoke this permit. The grounds for modification, suspension or revocation include:

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

6. Permit Transfer Permits are transferrable unless specifically prohibited by statute, regulation or another permit condition. Applications for permit transfer should be submitted prior to actual transfer of ownership.



NOTIFICATION OF OTHER PERMITTEE OBLIGATIONS

Item A: Permittee Accepts Legal Responsibility and Agrees to Indemnification

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

Item B: Permittee's Contractors to Comply with Permit

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

Item C: Permittee Responsible for Obtaining Other Required Permits

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

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

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