# ENVIRONMENTAL ASSESSMENT

**Amendment of License**

**Green Island Power Authority & Albany Engineering Corp.**

**Green Island Hydroelectric Project**

**FERC Project No. 13-039**

**Federal Energy Regulatory Commission**
**Office of Energy Projects**
**Division of Hydropower Administration & Compliance**
**888 First Street, NE**
**Washington, D.C. 20426**

**January 12, 2021**

## TABLE OF CONTENTS

## LIST OF FIGURES

**ENVIRONMENTAL ASSESSMENT**

**FEDERAL ENERGY REGULATORY COMMISSION**
**OFFICE OF ENERGY PROJECTS**
**DIVISION OF HYDROPOWER ADMINISTRATION AND COMPLIANCE**

## 1.0 INTRODUCTION

Project Name: Green Island Hydroelectric Project

FERC Project No.: 13-039

### 1.1 Application

Application Type: Amendment of License

Date Filed: April 8, 2020

Licensee: Green Island Power Authority & Albany Engineering Corp.

Water Body: Hudson River

Counties & State: Albany County, New York

### 1.2 Purpose and Need for Action

On April 8, 2020, Green Island Power Authority and Albany Engineering Corp. (co-licensees) filed an application with the Federal Energy Regulatory Commission (Commission) to amend the license for the 6.0-megawatt (MW) Green Island Hydroelectric Project located on the Hudson River in Albany County, New York (Figures 1 and 2).[1] The co-licensees propose to remove from the project license the previously approved, but never constructed, expansion of the powerhouse, installation of new hydraulically operated crest gates, and increase in project generation capacity.

The Green Island project was the subject of a compliance investigation beginning in 2018 as a result of the co-licensees' failure to construct the expanded powerhouse, install the required fish passage facilities and perform recreational enhancements required

[1] *Green Island Power Authority*, 140 FERC ¶ 62,133 (2012).

in the license. That investigation resulted in the October 2, 2019 issuance of an Order on Compliance Filing and Approving Fish Passage Design Drawings that: listed the co-licensees' numerous violations of their license requirements; directed the co-licensees to bring the project into compliance; and approved a previously filed plan for fish passage.[2] On November 21, 2019 the co-licensees filed notice that they would develop a non-capacity amendment to remove the expansion of the project from the license and address other items in the Order on Compliance Filing and Approving Fish Passage Design Drawings. The licensees state that the proposed amendments are necessary pursuant to discussions with Commission staff and the resource agencies to resolve all remaining obligations set forth in the 2012 license and Commission staff's October 2, 2019 Order on Compliance Filing and Approving Fish Passage Design Drawings.

The Commission must decide whether to amend the license for the project and what conditions, if any, should be placed on any amendment issued. The Commission will only issue an amendment to the current license that contains measures, if needed, for the protection, mitigation of, preventing damage to, and enhancement of fish and wildlife resources (including related spawning grounds and habitat); the protection of recreational opportunities; and the preservation of other aspects of the project environment. The analysis in this Environmental Assessment (EA) provides a basis for Commission staff to make an informed decision on the co-licensee's April 8, 2020 license amendment application.[3]

[2] *Green Island Power Authority*, 169 FERC ¶ 62,001.(Order on Compliance Filing and Approving Fish Passage Design Drawings)

[3] On July 16, 2020, the Council on Environmental Quality (CEQ) issued a final rule, *Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act* (Final Rule, 85 Fed. Reg. 43,304), which was effective as of September 14, 2020; however the NEPA review for this project was in process at that time and was prepared pursuant to CEQ's 1978 NEPA regulations.

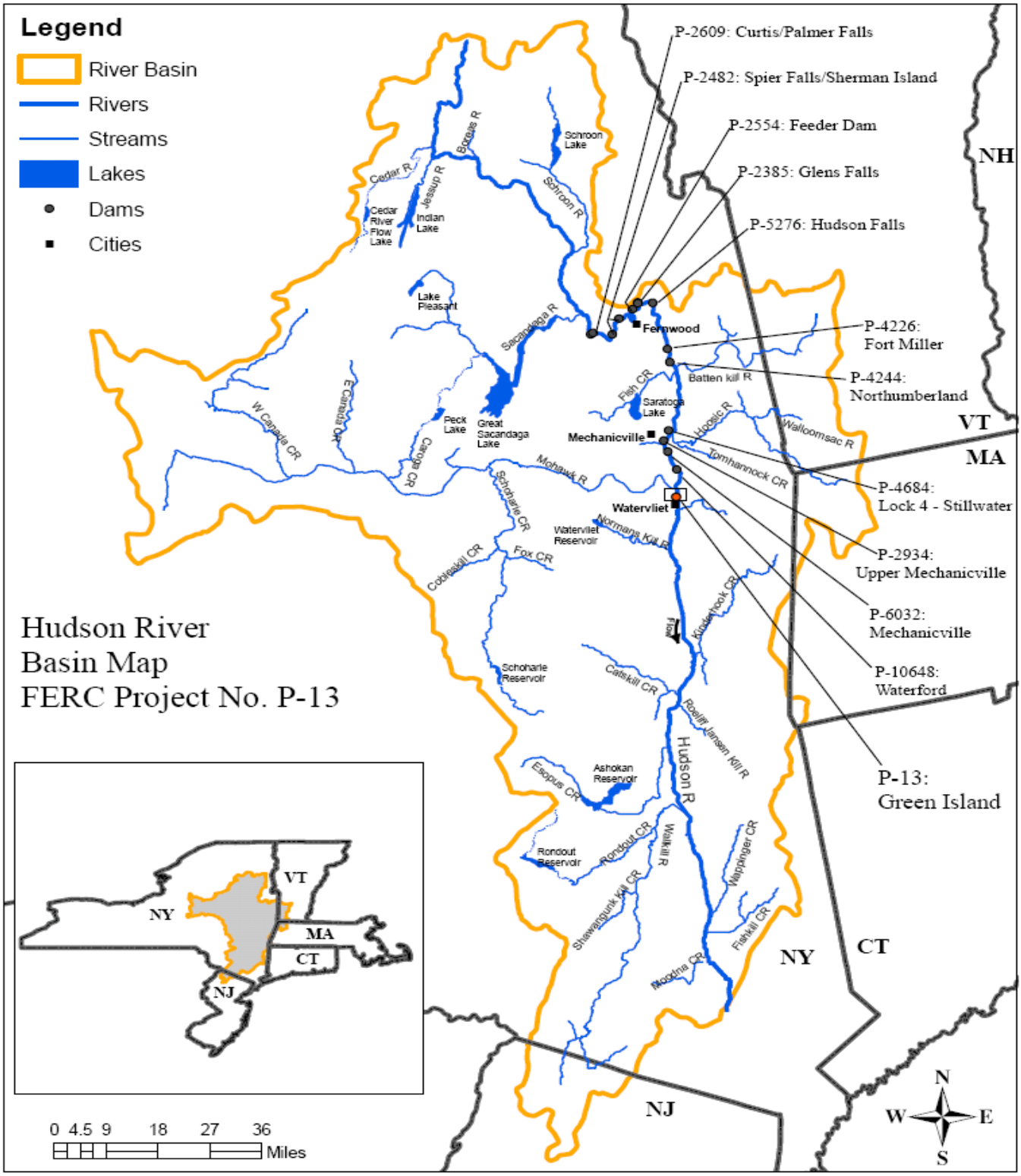


Figure 1. Hudson River Basin Map. (Source: Staff)

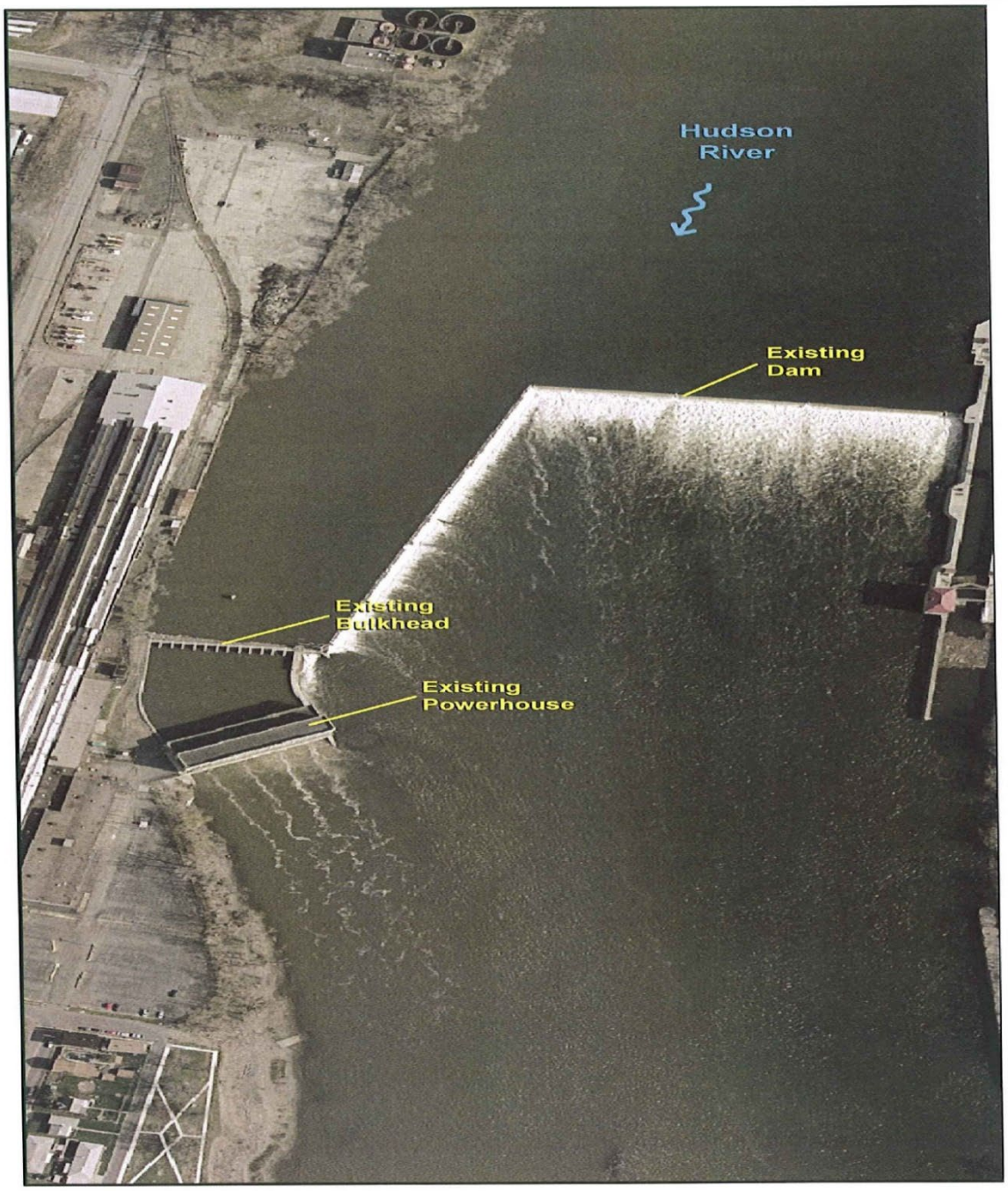


Figure 2. Existing Green Island Project. (Source: Co-licensees, as modified by Commission Staff)

## 2.0 PROJECT DESCRIPTION AND OPERATION

### 2.1 Existing Project Facilities

The project is located at the U.S. Army Corps of Engineers (Corps) Green Island-Troy lock and dam, on the Hudson River, and occupies approximately 15.12-acres of federal land managed by the Corps. The Green Island-Troy lock and dam is located near river mile 154 and was constructed between 1913 and 1915. The first hydroelectric project was built by Henry Ford in the early 1920s. The lock and dam consists of a 14.33-foot-high crest, 586-foot-long main spillway dam; a 16.33-foot-high, 750-foot-long auxiliary spillway; and a 520-foot-long, 45-foot-wide lock.

Existing project facilities consists of: (1) two-foot-high pneumatically operated spillway gates along the top of the main spillway dam raising the dam crest elevation to 16.33 feet mean sea level (MSL); (2) impounding a 700-acre impoundment with a normal water surface elevation of 16.33 feet MSL; (3) a bulkhead and forebay structure located downstream and at the west end of the Corps dam; (4) leading to a powerhouse containing four 1.5 MW generating units with a total installed capacity of 6.0 MW; and (5) a 140-foot-long, 13.8-kilovolt (kV) transmission line. The project bypasses a 750-foot-long section of the Hudson River. The project boundary generally follows the top of the riverbank (elevation 18.5 feet MSL) of the Hudson River from the downstream side of Lock No. 1, which is owned and maintained by the New York State Canal Corporation, to approximately five miles upstream of the project dam. The project boundary does not fully enclose the upstream limit of the impoundment, the downstream limit of the tailrace, the river debris collection facility, and the recreation area.

### 2.2 Existing Project Operation

Current project operation employs the use of pneumatically inflated bladders that are installed on the crest of the main spillway dam. A section of the inflatable bladders was damaged in 2019 and is undergoing repair. The fixed crest elevation of the main dam is 14.33 feet MSL. When the pneumatic bladders are fully inflated, the crest elevation is increased to 16.33 feet MSL. During conditions when river flow is less than the minimum hydraulic capacity of the powerhouse (400 cubic feet per second [cfs]), the impoundment level is maintained at 16.33 feet MSL. During conditions when river flow exceeds the maximum hydraulic capacity of the powerhouse (6,000 cfs), the pneumatically operated bladders remain inflated until the impoundment level reaches 18.5 feet MSL. At that point the bladders automatically deflate to about 14.33 feet MSL.

The co-licensees state that under present operating conditions, they strive, in cooperation with the Corps, to maintain a normal pool elevation at 16.33 feet MSL to the greatest extent possible by making adjustments to powerhouse turbine flow (i.e. as upstream inflow decreases, inflow to the powerhouse is reduced and vise-versa). The co-

licensees estimate that the average annual generation at the project is approximately 47,800 megawatt-hours (MWh).

### 2.3 Currently Licensed Project Facilities

As stated in ordering paragraph (B)(2) of the project's 2012 license, the project consists of the following (this does not reflect the actual existing facilities, but those as licensed): (1) a new hydraulically operated crest gates along the top of the main spillway with a maximum crest gate elevation of 18.5 feet MSL; (2) the upper 4.07 feet (i.e., from 14.33 feet MSL to 18.4 feet MSL) of impoundment controlled by the new crest gates and creating a 708-acre impoundment with a maximum water surface elevation of 18.4 feet MSL; (3) a new trash boom extending across and upstream of the forebay; (4) two new Denil fishways and three new upstream passage facilities for American eel; (5) a new downstream fish exclusion screen attached to a new bulkhead structure, a new downstream fish passage facility, and new plunge pool; (6) an existing forebay and existing powerhouse expanded on its east and west sides to accommodate four new 6.0 MW generating units and four new replacement 6.0 MW generating units for a total installed capacity of 48 MW; and a new 70-foot-long, 18.8-kilovolt transmission line.

## 3.0 PROPOSED ACTION AND ALTERNATIVES

### 3.1 Proposed Project Facilities

In order to address the Commission's Order on Compliance Filing and Approving Fish Passage Design Drawings, the co-licensees are proposing to remove the expansion of the project from the current license, and install downstream fish passage. In the amendment application the co-licensees propose to:

- Install new pneumatic flashboards, four feet in height, that would be installed on the fixed crest of the main spillway to achieve a maximum flashboard crest of 18.33 feet MSL. The existing pneumatic flashboards, two feet in height, would be relocated to the fixed crest of the auxiliary spillway to achieve a maximum flashboard crest of 18.33 feet MSL and increase the impoundment area from 700 acres to 708 acres (as currently licensed);

- Remove from the existing project license construction of new hydraulically operated crest gates along the top of the main spillway;

- Remove from the project license construction of a new bulkhead structure and reconfiguration of the auxiliary spillway;

- Remove from the project license expansion of the forebay and existing powerhouse expanded on its east and west sides to accommodate four new 6.0 MW generating units;

- Remove from the project license four new replacement 6.0 MW generating units in the existing powerhouse;

- Construct the new downstream fish exclusion screen, new downstream fish passage facility, and new plunge pool in and adjacent to the existing forebay in accordance with the October 2, 2019 Order on Compliance Filing and Approving Fish Passage Design Drawings;

- Relocate construction of a new trash boom extending across and upstream of the forebay in accordance with the October 2, 2019 Order on Compliance Filing and Approving Fish Passage Design Drawings;

- Remove from the project license construction of two new Denil fishways and replace with two fish lifts in accordance with the October 2, 2019 Order on Compliance Filing and Approving Fish Passage Design Drawings;

- Remove from the project license construction of three new upstream passage facilities for American eel and replace with construction of one upstream passage facility for American eel adjacent to the fish lift at the western (shore) side of the existing powerhouse based on the results of the eel siting study requested by the resource agencies on March 8, 2019, approved on March 21, 2019, and completed on December 5, 2019; and

- Remove from the project license expansion of the powerhouse tailrace; and remove from the project license a new 70-foot-long, 18.8-kV transmission line.

The co-licensees would provide the following recreational amenities: debris removal and vegetation maintenance/control along the shoreline from the powerhouse tailrace downstream to River Park to improve shoreline conditions for fishing and other river access activities; a kiosk in River Park to display and describe the historic Meneely bell that is owned by the Village of Green Island and currently in storage; and improvements to Paine Street Park including better access and installation of fencing and sidewalks.

### 3.1.1 Proposed Project Operation

The co-licensees propose to continue to operate the Green Island Project in run-of-river mode and not utilize any impoundment storage capacity. The current normal water surface elevation is 16.33 feet MSL with an impoundment area of 700 acres. The shoreline of the Hudson River within the project boundary has steep banks and increasing the normal water surface elevation from 16.33 feet to 18.33 feet MSL would result in only minimal increase in the impoundment area from 700 acres to the previously approved 708 acres. The increase in impoundment elevation and surface area would increase the total impounded storage volume behind the dam from 3,500 acre-feet to approximately 4,970 acre-feet. Other changes to project operation would include flows for the proposed fish passage facilities. No new transmission lines are proposed.

### 3.1.2 Proposed Environmental Measures

In Exhibit E of the amendment application, the co-licensees propose to limit project construction, repowering, and operation to the existing project footprint, modify the approved Recreation and Aesthetics Management Plan, and incorporate the functional design drawings for fish passage facilities filed pursuant to license Article 414, the New York State Department of Environmental Conservation's (New York DEC) WQC, and United States Department of Fish and Wildlife (FWS) and National Marine Fisheries Service (NMFS) Section 18 prescriptions, as approved by Commission staff's October 2, 2019 Order on Compliance Filing and Approving Fish Passage Design Drawings.

## 3.2 No-Action Alternative

Under the no-action alternative, the project would continue to operate under the terms and conditions of the existing license, with no new environmental protection, mitigation, or enhancement measures being implemented. The licensee would continue to be in violation of the October 2019 Order On Compliance Filing and Approving Fish Passage Design Drawings until such time as it complied with the requirements of its license and installed all the requisite features.

## 4.0 STATUTORY AND REGULATORY REQUIREMENTS

The license for the Green Island Project is subject to numerous requirements under the Federal Power Act (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 Green Island Project

| Requirement | Agency | Status |
|---|---|---|
| Section 18 of the FPA - fishway prescriptions | U.S. Department of Interior (Interior) | Reservation of authority to prescribe fishways. Approval of fishway drawings on July 30, 2019. |
| | National Marine Fisheries Service (NMFS) | Reservation of authority to prescribe fishways. Approval of fishway drawings on July 31, 2019 |
| Section 401 of the Clean Water Act—(WQC) | New York Department of Environmental Conservation (New York DEC) | Original WQC issued on February 11, 2011. Deferral for fishway approval to U.S. Fish and Wildlife Service (FWS) on March 25, 2019. |
| Endangered Species Act (ESA) | National Marine Fisheries Service | Section 5.5 of this EA provides the Commission's environmental analysis of the effects of the proposed action on shortnose sturgeon. |
| Section 106 of the National Historic Preservation Act | New York State Historic Preservation Office (SHPO) | No change to approved Programmatic Agreement executed on November 5, 2010 with original license pursuant to Article 413. |

### 4.1 Section 18 Fishway Prescriptions

Section 18 of the FPA states that the Commission is to require construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of Commerce or the Interior. The license includes fishway prescriptions submitted by Interior and NMFS as well as reserving authority to modify them in the future if needed. The license requires the installation of upstream and downstream anadromous and American eel fish passage facilities. As a result of the proposed amendment, NMFS and Interior stated that there have been no changes to the section 18

prescriptions from prescriptions included in the 2012 license. NMFS and Interior approved fishway design drawings and plans for the project on July 31, 2019. The approvals included: (1) the construction of an upstream fish lift at the existing powerhouse; (2) an upstream eel ladder at the existing powerhouse; (3) a downstream fish safe hydro intake system (FISHIS$^{R}$) passage system at the existing powerhouse: (4) the implementation of a fishway effectiveness monitoring plan; (5) conducting upstream and downstream fish passage effectiveness studies; and (6) modifying upstream and downstream fish passage facilities based on effectiveness testing results.

### 4.2 Clean Water Act

Under section 401(a)(1) of the Clean Water Act (CWA), license applicants must obtain either certification that any discharge from a project would comply with applicable provisions of the CWA, or a waiver of certification by the appropriate state agency. New York DEC issued its original WQC on February 11, 2011 and Condition 11 requires the licensees to construct, operate and maintain upstream and downstream fish passage facilities that pass diadromous and resident fish species (other than shortnose sturgeon) in a safe, timely and effective manner. Therefore, the approved fish passage drawings meet this requirement and New York DEC deferred further review to FWS.

### 4.3 Endangered Species Act

Section 7 of the ESA of 1973[4] 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 modification of the critical habitat of such species. One federally listed species is known to occur in the Green Island Project vicinity: the shortnose sturgeon, *Acipenser brevirostrum*. There is currently no proposed critical habitat for the shortnose sturgeon in the project vicinity.

In its license application, the co-licensees filed a Settlement with the Commission on January 15, 2010 that included a Shortnose Sturgeon Mitigation Plan to be prepared and implemented by the co-licensees to avoid or eliminate any adverse effects the proposed Green Island Project may have on the endangered shortnose sturgeon. The plan was approved on February 2, 2011 and included as a requirement in the license as Article 405 and remains unchanged in the amendment application. The amendment application does not modify the approved Shortnose Sturgeon Mitigation Plan, therefore, the mitigation of any possible adverse effects will be continued if the application is approved, and there would be no adverse impacts as a result of the proposed action.

[4] 16 U.S.C. § 1536(a) (2006).

### 4.4 National Historic Preservation Act

Section 106 of the National Historic Preservation Act[5] requires that a federal agency "take into account" how its undertakings 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).

The project's powerhouse is eligible for listing on the State and National Registers. As part of its amendment application, the co-licensees do not plan any alterations to the powerhouse that affect the structures historic integrity. On November 5, 2010, the Commission executed a Programmatic Agreement with the State Historic Preservation Officer (SHPO) requiring the filing of a Historic Properties Management Plan (HPMP). The HPMP was approved on March 1, 2016 and included in existing Article 413 and remains a license requirement.[6]

## 5.0 AGENCY CONSULTATION AND PUBLIC INVOLVEMENT

### 5.1 Comments on the Amendment Application

On May 1, 2020, the Commission issued a public notice stating the application was ready for environmental analysis and requested comments, recommendations, preliminary terms and conditions, and preliminary fishway prescriptions. This notice set June 15, 2020, as the filing deadline. The following entities commented:

| Commenting Entity | Date Filed |
|---|---|
| Interior (FWS) | May 19, 2020 |
| Environmental Protection Agency (EPA) | June 2, 2020 |
| Interior – Motion to Intervene | June 11, 2020 |

### 5.2 U.S. Army Corps of Engineers – Terms and Conditions

Pursuant to a Memorandum of Understanding between the Commission and the Department of the Army,[7] licensed hydropower facilities that would be an integral part of

[5] 36 C.F.R. Part 800 (2016).

[6] Order Approving Historic Properties Management Plan issued March 1, 2016 (154 FERC ¶ 62,140).

[7] See Memorandum of Understanding between the Commission and the Corps of

or that affect the structural integrity or operation of a Corps' project are to be designed and constructed in consultation with and subject to the review and approval of the appropriate Corps' District Engineer. Pursuant to license Article 311 the licensee has filed a copy of its Regulating Plan and Operating Agreement with the Corps on April 11, 2013. The Agreement continues to remain in force with the proposed amendment.

## 6.0 ENVIRONMENTAL ANALYSIS

This section includes: (1) a general description of the project vicinity and (2) our analysis of the proposed action and recommended environmental measures. Unless noted otherwise, the sources of our information are the license amendment application (co-licensees, 2020), Order on Compliance Filing and Approving Fish Passage Design Drawings issued October 2, 2019 and the previous Final Environmental Assessment issued for the relicensing of the project issued on January 5, 2011.

### 6.1 Description of the General Area

The Green Island Project is located at approximately river mile 154 on the Hudson River in east-central New York, in the Village of Green Island, Albany County, New York. The Green Island-Troy lock and dam is the first dam located upstream from the Upper New York Bay. The Hudson River originates in the Adirondack Mountains in northern New York, and flows in a southerly direction for about 315 river miles to Upper New York Bay, an arm of the Atlantic Ocean. The Hudson River drains a total area of approximately 12,650 square miles, and an area about 8,090 square miles at Green Island, New York (FWS, 1997).

### 6.2 Resource Area Descriptions and Analysis

In this section, we discuss the effects of the license amendment on environmental resources. For each resource, we first describe the affected environment, and then discuss and analyze the site-specific environmental effects.

Only the resources that would be affected, or about which comments have been received, are addressed in detail in this EA. We present our recommendations in the Recommendations and Conclusions.

---

Engineers regarding Non-federal Hydropower Projects, November 1981 (http://www.ferc.gov/legal/maj-ord-reg/mou/mou-2.pdf).

## A. Water Quantity and Quality

Affected Environment

New York State has established ambient water quality standards and guidance values for the protection of surface waters in the state. Surface waters are classified for their best usage under a state program with federal oversight. The Hudson River through Albany County is listed as Class C, suitable for fishing and non-contact activities. Previous studies for the license application found that temperature and dissolved oxygen levels during the critical periods of July and August were in compliance with state water quality standards. Fluctuations in impoundment levels and instream flows downstream of hydropower projects have the potential to adversely affect aquatic resources by contributing to shoreline erosion, sediment mobilization, dewatering of fish nests and preventing the establishment of aquatic vegetation that can provide cover and forage for fish. The extent of such effects depends on the frequency, magnitude, duration and timing of these fluctuations.

Environmental Affects

Co-licensees currently operate the Green Island Project in a run-of-release mode (using only flows released by the Corps) and propose to continue run-of-release mode operations with minimal headpond elevation changes as previously approved. The authorized impoundment area would also remain at 708 acres, as currently licensed. Therefore, there would be no impacts to water quantity or quality as a result of the proposed action. A water quality and stream flow monitoring plan is included in the Settlement Agreement, Section 3.7 located in Appendix E of the license.

## B. Fishery Resources

Affected Environment

The Hudson River, in the vicinity of the project, supports a mixed coolwater and warmwater fishery. Resident game fish species include smallmouth bass (*Micropterus dolomieu*), largemouth bass (*M. salmoides)*, walleye (*Sander vitreus*), and white perch (*Morone americana*). Other common resident fish species include bluegill (*Lepomis macrochris*), pumpkinseed (*L. gibbosus),* rock bass (*Ambloplites rupestris*), yellow perch (*Perca flavescens*), brown bullhead (*Ameiurus nebulosus*), common carp (*Cyprinus carpio*), and golden shiner (*Notemigonus crysoleucas*). Diadromus (i.e., migratory) fish species include the anadromous (adults migrate from the ocean to bodies of freshwater to spawn) blueback herring (*Alosa aestivalis*), alewife (*A. pseudoharengus*), American shad (*A. sapidissima*), striped bass (*Morone saxatilis*), and the federally-listed endangered shortnose sturgeon (*Acipenser brevirostrum*) and the catadromous (adults migrate from bodies of freshwater to the ocean to spawn) American eel (*Anguilla rostrata*).

The Hudson River stock of migratory fish, including shad, alewife, and blueback herring, as well as striped bass, shortnose sturgeon, and American eel have shown steady population declines over the past several decades due primarily to overexploitation, degradation of habitat and water quality, and blockage of fish movement by obstacles such as dams.

Environmental Effects

*Downstream Fish Passage and Exclusion System*

The co-licensees still propose to install and operate downstream fish passage system known as FISHIS$^{R}$ to prevent or minimize fish entrainment into the project's intakes which can result in turbine mortality or injury. The FISHIS$^{R}$ would include an exclusion screen to prevent fish from entering the project's intake directing them into a downstream fish bypass facility. The FISHIS$^{R}$ would allow resident (non-migratory) and diadromous (migratory) fish to pass safely and effectively downstream past the project.

Interior and NMFS prescribed, pursuant to Section 18, downstream fishway facilities to protect diadromous fish species migrating downstream, primarily American eel, blueback herring, American shad, alewife, and resident fish. The agencies also require a fishway effectiveness monitoring plan. Both the proposed passage facilities and the monitoring are consistent with Interior's and NMFS's requirements. Dedicated fish exclusion and passage facilities would prevent fish from entering the project's intake and being injured or killed passing through the project's turbines and draft tubes. Presently, no downstream fish passage or exclusion facilities exist at the project site and flows through the existing project have the potential to entrain fish. Injury and mortality to juvenile and adult resident fish should be significantly reduced, and the diadromous fish populations should be significantly enhanced with the installation of the co-licensees proposed FISHIS$^{R}$. The FISHIS$^{R}$ design would be an exclusion device for fish that are too large to pass through the openings and the screen's surface to bottom orientation should divert both surface and bottom oriented fish, including eels, away from the turbines. Therefore, this system should provide safe, timely, and effective downstream passage of fish. However, the FISHIS$^{R}$ is an experimental design, and as such has not been extensively tested. A Fishway Effectiveness Monitoring Plan, as required by the October 2, 2019 Order on Compliance Filing and Approving Fish Passage Design Drawings, will evaluate the effectiveness of the FISHIS$^{R}$ design.

*Upstream Fish Passage Facilities (Fish Lifts and Eel Ladder)*

Under its proposed amendment the co-licensees would install upstream fish lifts to enhance the upstream migration of the river's diadromous fish species (blueback herring, American shad, and alewife) and an eel ladder for upstream passage of American eel. No

fish passage facilities are proposed to encourage the upstream movement of the shortnose sturgeon past Troy Dam. The resource agencies' management plan for the shortnose sturgeon, at this time, does not include upstream passage beyond the Troy dam. The co-licensees would prepare a fishery facilities operation and maintenance plan that would include regular maintenance and monitoring activities of the proposed fish passage facilities to ensure the facilities operate effectively and that shortnose sturgeon are not using the proposed passage facilities to move upstream. Under the current license the co-licensees would continue to monitor for the presence of shortnose sturgeon at the proposed lift for five consecutive years after amendment issuance to ensure that no shortnose sturgeon are using the lifts.

Interior and NMFS have, and continue to prescribe, upstream fish passage facilities that would pass diadromous fish species (other than shortnose sturgeon) in a safe, timely, and effective manner. In addition, Interior and NMFS prescribe that the fish passage facilities be operated so that they do not pass shortnose sturgeon upstream nor cause sturgeon injury or significant impairment. Interior and NMFS also require a fishery facilities operation and maintenance plan. The proposed amendment appears to be consistent with all of Interior's and NMFS's requirements and 18 prescriptions.

Dedicated upstream passage facilities would allow movement of migratory fish past Troy Dam and the proposed project. Currently no dedicated fish passage facilities exist at the project site although fish likely maneuver through the Corps' lock to reach areas upstream. The lock is not managed as a fishway and no studies have been completed that show the lock is an efficient means for anadromous and catadromous fish species in the Hudson River to move upstream past the project site. The new fish lifts and an eel ladder would provide a safe and effective means of enhancing the movement of migratory fish upstream past Troy Dam and the project. The design of the fish lifts and eel ladder are based on known engineering criteria and the best science available and would likely provide safe, timely, and effective fish passage upstream of the project. However, if the fishway facilities are ineffective, inefficient, or unsafe, the Fishery Facilities Operation and Maintenance Plan would identify the problems and allow for modifications that would ensure that the proposed lift and eel ladder are safe and effective. Similarly, monitoring for the presence of shortnose sturgeon at the proposed fish lift would help ensure that no shortnose sturgeon are using it.

## C. Threatened and Endangered Species

Affected Environment

One federally listed endangered species is known to occur in the Green Island Project vicinity: the endangered shortnose sturgeon, *Acipenser brevirostrum*. There is no proposed critical habitat for the shortnose sturgeon in the project vicinity. NMFS recommends that the co-licensees continue to operate the project in a manner that would neither injure nor impair essential behavior patterns of shortnose sturgeon.

Under the Endangered Species Preservation Act of 1966**,** shortnose sturgeon were listed in 1967 as federally-endangered primarily due to overexploitation, habitat destruction, stream blockage, and water degradation. The shortnose sturgeon found at the project site, reside most of the year in the lower part (i.e., the tidal estuarine part) of the Hudson River and miles downstream from the project site. During spawning season which typically occurs between April 1 and May 31 each year, adult shortnose sturgeon move upstream to spawn near the Troy Dam. Following spawning, early life stages (eggs, larva, and juveniles) of shortnose sturgeon can be found in the proposed project area until about June 30. The exact period that shortnose sturgeon spawn near the project site varies yearly and is primarily dictated by water temperature. Generally, shortnose sturgeon spawn when water temperatures are between approximately 46 °F and 64 °F.

Environmental Effects

Under Article 405 of the license, the Commission approved the co-licensees' Shortnose Sturgeon Mitigation Plan that minimizes project-related effects on the federally-listed endangered shortnose sturgeon. To ensure that operation of its project would not adversely affect shortnose sturgeon, the co-licensees would continue to implement its approved shortnose sturgeon mitigation, handling and monitoring plans. The shortnose sturgeon plans should address the potential of any adverse effects to shortnose sturgeon as the result of continuing project operation and fish passage installation.

Accordingly, Article 405 and the approved shortnose sturgeon mitigation plan should mitigate any potential adverse effects caused by project construction and operation that would not otherwise be entirely avoided, eliminated, or minimized.

## D. Land Use and Recreation

Affected Environment

Land use in the project area has historically consisted of industrial and commercial uses interspersed with urban residential facilities. The land immediately to the east of the

project is federally owned and includes the Troy Dam, the lock, administrative offices, maintenance buildings, parking lots, access roads and lawn areas. On the east side of the river, development generally eliminates views of the river to passersby using the major north-south roadways in the vicinity of the project.

The project occupies federal land on the west side of the river. The land immediately to the west of the project is comprised of vacant land in the Village of Green Island, which overall contains 189.5 acres of industrial zoned property. The property is located at the confluence of the Mohawk and Hudson Rivers. The west side of the river, downstream from the project, provides river views and access.

Regional Recreation

The project is located within the boundary of both the Erie Canal National Heritage Corridor and the Hudson River Valley National Heritage Corridor. There are numerous and varied recreational opportunities available in the nearby urban, suburban, and rural regions, including: John Boyd Thacher State Park, Six Mile Waterworks Park, the City of Albany Riverfront Park at Corning Preserve, and several city parks in Albany. Paine Street Park, River Park, Veterans Memorial Stadium, and Veterans Memorial Park provide varied recreation opportunities within the Village of Green Island. The City of Troy constructed the Ingalls Avenue Boat Launch and Park, located across and downstream from the tailrace area, just south of the Troy Lock with Hudson River frontage. Fishing downstream of the Troy Dam is an extremely popular activity; anglers use both sides of the Hudson River immediately downstream of the dam and lock for extensive shoreline fishing. There are ten access points on the Hudson River upstream from the dam hosts; these include six existing boat launches, as well as marinas, docks, and boat clubs.

Project Recreation

For safety and security reasons associated with both the navigational and hydroelectric facilities, access for fishing is presently limited to the powerhouse tailrace area. Co-licensees maintain signage, parking, and a pedestrian ramp to provide access for shoreline fishing in the tailrace area.

Environmental Effects

The recreation improvements required by Article 412 were to be constructed in conjunction with the expansion of the project. Absent the project expansion, and based on consultation with the Town and Village of Green Island, the co-licensees would provide the following recreational amenities: debris removal and vegetation maintenance/control along the shoreline from the powerhouse tailrace downstream to River Park to improve shoreline conditions for fishing and other river access activities; a

kiosk in River Park to display and describe the historic Meneely bell that is owned by the Village of Green Island and currently in storage; and improvements to Paine Street Park including better access and installation of fencing and sidewalks. These facilities would enhance regional opportunities in a positive manner and improve the riverfront area. The proposed enhancements would assist in accommodating the anticipated future growth in the demand for local, recreational opportunities.

Debris removal and vegetation maintenance/control along the shoreline from the powerhouse tailrace downstream to River Park can cause temporary disturbances to the shoreline. Employing erosion control and restoration practices would minimize impacts to environmental resources.

The proposed removal of debris and maintenance/control of vegetation along the shoreline from the tailrace to River Park would improve conditions for fishing and other river access activities. The kiosk would provide information about the Meneely bell, which is of local significance. The improvements to Paine Street Park would enhance public use and enjoyment of the park.

## E. Cultural Resources

Affected Environment

Area of Potential Effect

The Advisory Council on Historic Preservation defines an area of potential effect (APE) as the geographic area or areas in which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE for the Green Island Project includes: (a) lands enclosed by the project boundary (including the impoundment, existing Troy Dam, and the riverfront property on the west shore of the river just below the project tailrace and owned by the Village of Green Island); and (b) lands or properties outside the project boundary which project operations or project-related recreational development or other enhancements may cause changes in the character or use of historic properties, if any exist.

Historic Properties

The co-licensees previously conducted an Eligibility and Impact Report to determine the eligibility of the powerhouse for listing on the National Register of Historic Places and any effects that the currently authorized project has on the powerhouse. The report was prepared by Steven M. Bedford, Ph.D. in 2009. The report concluded that previous alterations to the powerhouse have not substantially affected the integrity of the powerhouse while the alterations to the mechanical systems have only ensured its continued efficient operation. Dr. Bedford recommends that given the age of the

powerhouse, the role it played in the continuing development of the industry in the early 20th century in what was one of the birthplaces of the 19th century industrial revolution, its association with a well-known hydroelectric plant design firm and its high degree of integrity, the powerhouse would appear to be eligible for the National Register under Criterion A for its contribution to the history of industry, industrial planning and power generation in New York State. The powerhouse would also be eligible for the National Register under Criterion C as an important example of a hydroelectric plant in New York State designed by an important firm from the 20th century. Its period of significance would extend from 1921 to 1973. The Troy Dam and lock have been significantly altered over time and are not considered eligible for the National Register.

The Phase 1A report conducted for the Green Island Hydroelectric Project recommended that a Phase 1B archaeological survey of limited shovel testing be conducted in any undisturbed and uncontaminated areas of the riverbank south of the powerhouse, where shoreline fishing access currently exists, and where construction of a pedestrian walkway and fishing pier was originally proposed. In its November 20, 2008 project review letter, New York SHPO stated that "we have reviewed the Green Island Hydroelectric Project and we have no further building concerns with this project."

Environmental Effects

The co-licensees propose no major alterations to the Green Island Project powerhouse. The approved HPMP provides the following guidance for the protection and management of historic properties located within the APE for the project: (1) it describes the scope and purpose of the HPMP: (2) describes the project's APE; (3) provides surveys completed to determine archaeological and historic resources; (4) includes measures for inadvertent discoveries and the treatment of human remains (5) provides a list of categorical exclusions that would not require prior consultation with the New York SHPO; (6) a provides procedure to consult with the SHPO, Indian tribes and Commission for any future actions; (7) it appoints a Cultural Resource Administrator to implement the HPMP and serve as the co-licensees' liaison with the agencies and the Indian tribes; (8) provides measures for emergency situations; (9) provides measures to address on-going effects; (9) provides preservation goals and methods; and (10) requires the co-licensees to conduct formal reviews of the HPMP every five years for the first ten years following approval of the HPMP, and every ten years thereafter to determine if revisions are necessary.

Powerhouse

Managing the project's powerhouse as if it is listed on the National Register of Historic Places would protect the structure's historic integrity. Continued consultation with the SHPO would provide a mechanism to ensure the existing powerhouse retains its historic integrity. Measures in the project's approved HPMP include measures to

replicate the original windows using original drawings of the powerhouse for guidance. The co-licensee's application did not mention its consultation with the SHPO regarding the decision not to expand the powerhouse. However, the SHPO issued a letter filed on August 19, 2020 agreeing that since there is no ground disturbance or alteration of the powerhouse windows as a result of the amendment, that its initial finding of No Effect remains unchanged.

Impoundment Water Level

Raising the impoundment water level may affect undiscovered cultural resources. If in the future, any historic properties are identified and be affected by project operations, the Programmatic Agreement would require the co-licensees to consult with the SHPO and the Commission to determine the appropriate management and protection measures.

### F. Project Safety

The project has been operating under its current license since August 1, 2012. During this time, Commission staff have 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. In addition, the project has been inspected every 5 years by an independent consultant and a consultant's safety report has been submitted for Commission review. Commission staff would continue to inspect the project during the license term to ensure continued adherence to Commission-approved plans and specifications, special license articles relating to operation and maintenance, and accepted engineering practices and procedures.

## 7.0 RECOMMENDATIONS AND CONCLUSIONS

This section contains the basis for, and a summary of, our recommendations for amending the license for the project. It also contains the conclusion of our analysis.

### A. Recommendations

In addition to the co-licensees proposed environmental measures, we recommend the following measures to protect the aquatic resources of the Hudson River:

Downstream Fish Passage and Exclusion System

Under Section 18 of the FPA, Interior and NMFS prescribed downstream fishway facilities to protect diadromous fish species migrating downstream, primarily American eel, blueback herring, American shad, alewife, and resident fish. Fish exclusion and passage facilities would help prevent fish from entering the proposed project's intake and being injured or killed passing through the proposed project's turbines and draft tubes and to safely move downstream of the project site. Under the current license, the co-licensees would install, operate and maintain a FISHIS$^{R}$ to prevent or minimize fish entrainment, which would otherwise result in turbine mortality or injury. Consequently, the river's diadromous and resident fish populations should be significantly enhanced with the installation of the proposed FISHIS$^{R}$ and its effective operation. The co-licensees would develop a fishway effectiveness monitoring plan to evaluate the effectiveness of the FISHIS$^{R}$ design to ensure the intended performance is achieved pursuant to the project's Water Quality Certification, (Appendices A, section 13), and the project's Section 18 fishway prescriptions (Appendix B section 11.5, and Appendix C section 5) of the 2012 license. This is required by the October 2, 2019 Order on Compliance Filing and Approving Fish Passage Design Drawings. EPA noted that best management practices should be implemented during construction to prevent the release of any hazardous materials, as well as measures to prevent soil erosion and to notify the appropriate agencies of the release of any regulated material as a result of construction.

Upstream Fish Passage Facilities (Fish Lift and Eel ladder)

The co-licensees would install two fish lifts at the existing powerhouse along with a single eel ladder, respectively, to enhance the upstream migration of the river's diadromous fish species. The new fish lifts and eel ladder would provide a safe and effective means of enhancing the migrations of migratory fish upstream past Troy Dam and the proposed project. The design of the facilities were provided in the amendment filing. The proposed fish facilities operation and maintenance plan would ensure the proposed upstream facilities and the proposed FISHIS$^{R}$ discussed above operate and are maintained properly. The co-licensees will develop a fish lift facilities operation and maintenance plan that includes both fish lifts and the eel ladder, and a fish exclusion (FISHIS$^{R}$) facilities operation and maintenance plan as well as a fishway operations and maintenance plan. The plans are to be developed in consultation with the resource agencies as required by the Order on Compliance Filing and Approving Fish Passage Design Drawings.[8] Similar to the above EPA noted that best management practices should be implemented during construction.

[8] *Green Island Power Authority*, 169 FERC ¶ 62,001 at 23

Recreation and Aesthetics Management

The recreation improvements in Article 412 were to be constructed in conjunction with the expansion of the project. Absent the project expansion, the co-licensees propose to remove debris and maintain/control vegetation along the shoreline, install a kiosk to display and describe the historic Meneely bell, and improve Paine Street Park. These measures would enhance shoreline conditions and increase access for fishing and other recreational opportunities at the project, as well as improving aesthetics near the riverfront area.

### B. Conclusion

Based on our review of the agency and public comments filed on the project and our independent analysis, we conclude that amending the license for the Green Island Project, to remove or amend certain license articles, as proposed by the co-licensees in consultation with the resource agencies and with the recommendations in this EA, would be best adapted to a plan for improving the Hudson waterway.

## 8.0 FINDING OF NO SIGNIFICANT IMPACT

If the Green Island Project is amended as proposed with the agency and staff recommended measures, the project would continue to operate 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, approval of the proposed action for the Green Island Project, as proposed with staff-recommended measures, would not constitute a major federal action significantly affecting the quality of the human environment.

## 9.0 LITERATURE CITED

U.S. Fish and Wildlife Service. 1997. Significant Habitats and Habitat Complexes Of The New York Bight Watershed. Southern New England - New York Bight Coastal Ecosystems Program, Charlestown, Rhode Island. November 1997.

## 10.0 LIST OF PREPARERS

Joseph Enrico – Aquatic and Fisheries Resources (Environmental Protection Specialist; B.S. Marine Science)
Shana High – Land Use and Recreation (Environmental Biologist; B.S., Environmental Science)
Andrea Claros – Editor (Ecologist; M.A. Biology, B.S., Biology)