



gas | electric | steam | telecom
May 31, 2010

Commissioners:
Francis J. Hoey, III
Robert H. Griffin
Raymond H. Feyre

Manager:
James M. Lavelle

Deborah Howland
Executive Director
New Hampshire Public Utilities Commission
21 South Fruit Street, Suite 10
Concord, NH 03301-2429

Dear Ms. Howland:

SUBJECT: Class IV Renewable Energy Certificate Application for Holyoke Gas & Electric Department Existing Small Hydroelectric Facilities

Please find attached The City of Holyoke Gas and Electric Department (HG&E) application for qualification to produce renewable energy certificates consistent with the New Hampshire Public Utilities Commission Renewable Portfolio Standard (Chapter PUC 2500).

This application requests eligibility determination for fourteen (14) small hydroelectric facilities listed in Appendix A – Facility Information Table to qualify as Class IV sources. Each facility is located in Holyoke, Massachusetts, began operation before January 1, 2006, has a gross nameplate capacity of 5 megawatts or less, has installed FERC required and approved upstream and downstream fish passages and has obtained all necessary state water quality certifications as defined by PUC 2502.10. HG&E requests a separate Class IV certification number for each of the fourteen facilities in this application.

As listed in the application requirements of PUC2505.02, the following documents supporting eligibility determination are included:

1. Class IV Facility Information Application
2. Appendix A – Facility Information Table
3. Appendix B – FERC Operating Licenses
4. Appendix C – Water Quality Certificates
5. Appendix D – Connecticut DPUC Decisions
6. Appendix E – Rhode Island PUC Decisions

Please contact me if you have any questions or require additional information.

Sincerely,

Jeanette A. Sypek
Holyoke Gas & Electric Department
Sr. Energy Resources Coordinator
99 Suffolk Street
Holyoke, MA 01040
(413) 536-9373
jsypek@hged.com

1. APPLICANT

The City of Holyoke Gas and Electric Department
99 Suffolk Street
Holyoke, MA 01040

Primary Contact

Jeanette A. Sypek
Sr. Energy Resources Coordinator
Holyoke Gas & Electric Department
99 Suffolk Street
Holyoke, MA 01040
Phone: (413) 536-9373
Fax: (413) 536-9353
Email: jsypek@hged.com

Secondary Contact

Brian C. Beauregard
Superintendent, Electric Division
Holyoke Gas & Electric Department
99 Suffolk Street
Holyoke, MA 01040
Phone: (413) 536-9352
Fax: (413) 536-9353
Email: bbeauregard@hged.com

2. NAME AND LOCATION OF FACILITY

- Location information is presented in Appendix A – Facility Information Table.

3. ISO-NEW ENGLAND ASSET IDENTIFICATION NUMBER

- ISO New England Asset Identification is presented in Appendix A – Facility Information Table.

4. GIS FACILITY CODE

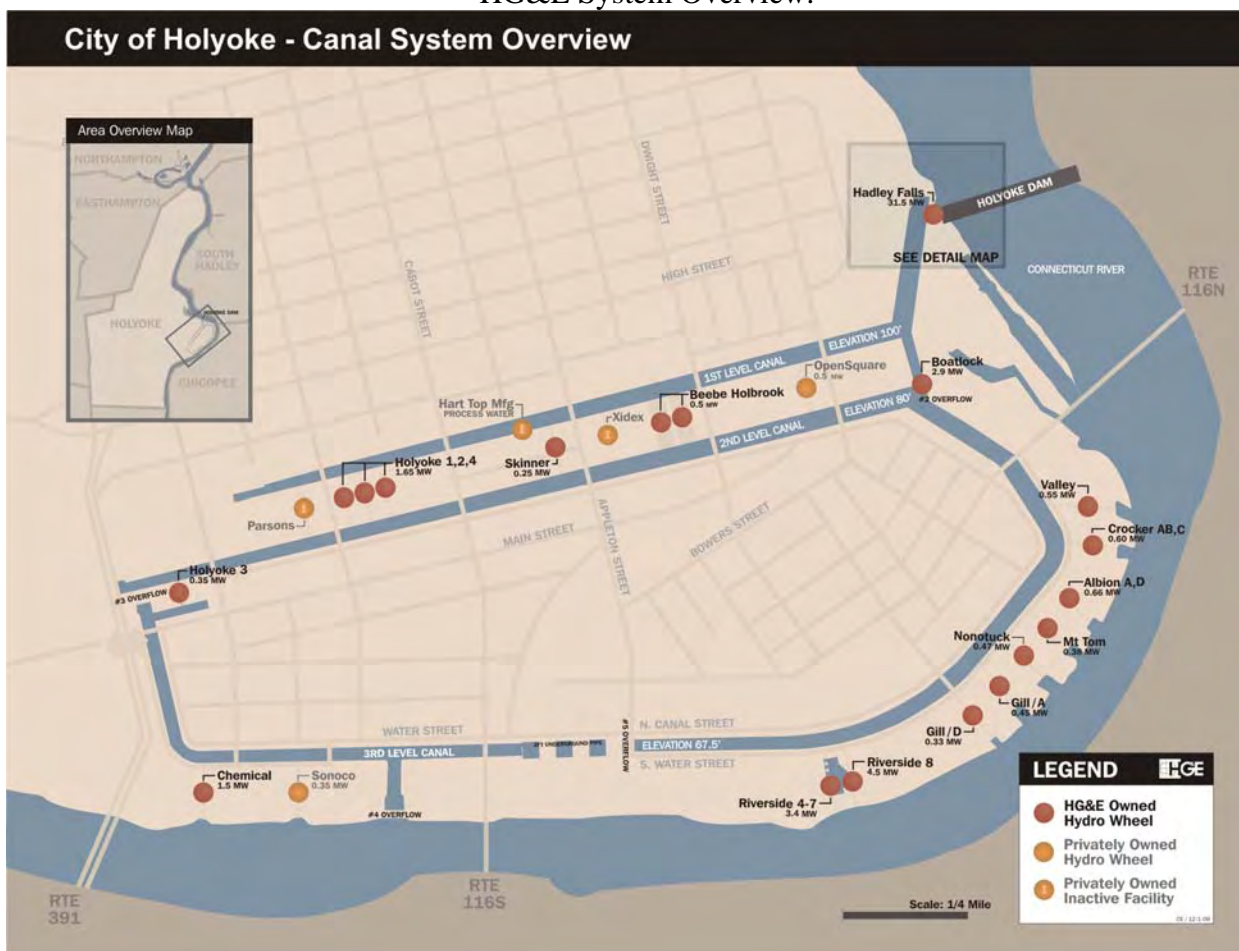
- NEPOOL GIS Facility Code is presented in Appendix A – Facility Information Table.

5. DESCRIPTION OF FACILITY

This Application for New Hampshire Class IV Eligibility includes fourteen (14) facilities under nine (9) separate FERC Licenses. The Holyoke Project License (FERC No. 2004) includes the Hadley Falls Station (not part of this application) and five of the canal stations. The remaining canal stations in this application are separately licensed, as listed in Section 5C of this application. The Holyoke Project License includes numerous conditions that affect all seventeen canal stations owned by Holyoke Gas and Electric Department (HG&E) despite their separate licensing status (e.g., fish passage, water quality canal flows and operations). Therefore, discussion of

the entire HG&E hydro power system, encompassing the Hadley Falls Station on the Connecticut River and the fourteen stations in this application on the Holyoke Canal System is needed. Only the Hadley Falls Station has a dam and an impoundment. The remaining stations are located on the Holyoke Canal System (Figure 1). The following sections provide descriptions of each station.

Figure 1
HG&E System Overview.



The City of Holyoke Gas and Electric Department has generated electricity since 1902. On December 14, 2001, HG&E purchased the hydroelectric assets previously held by the Holyoke Water Power Company, a subsidiary of Northeast Utilities. These assets include the Hadley Falls Dam, Holyoke Canal System, and nearly 46 MW of hydroelectric electrical generating capacity. In December 2004, HG&E acquired another nine small hydroelectric units within the Holyoke Canal System with approximately a 3.5 MW total capacity.

5A. The Hadley Falls Dam

HG&E's hydroelectric system is based on the Hadley Falls Dam, which diverts flow from the mainstream of the Connecticut River and creates an impoundment for potential head and power. Flow and head at the dam are used immediately at the capstone Hadley Station (not included in this application). The diversion dam also feeds an elaborate network of canals, providing cascading head and flow to a series of smaller hydroelectric stations and units.

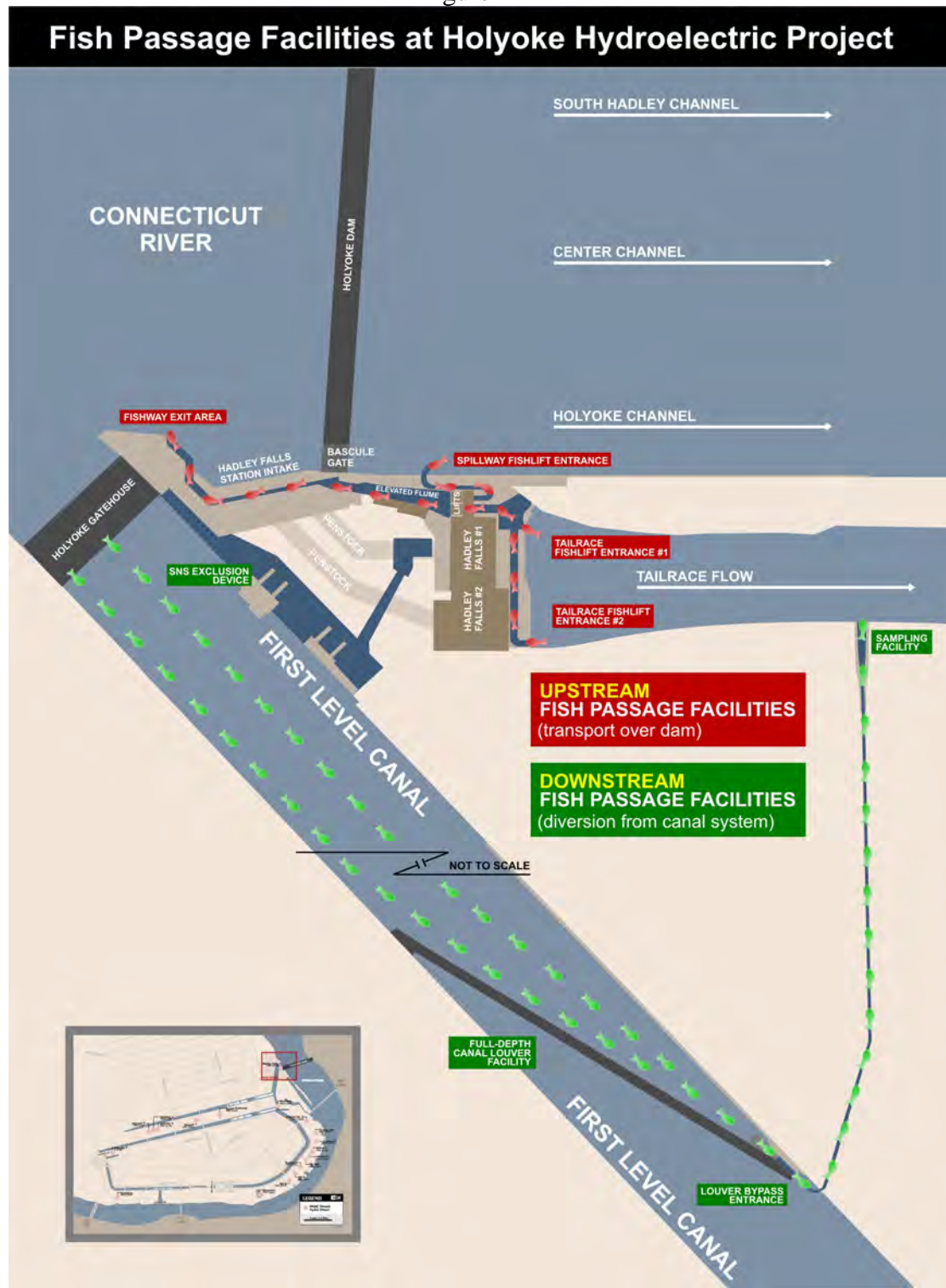
The Hadley Falls Dam is a stone masonry gravity-type structure, 30 feet high and 985 feet long. The Dam is located on the Connecticut River at mile 80 in Hampden, Hampshire, and Franklin counties, Massachusetts. An intake is located at the right abutment which provides water to Hadley Station (not included in this application), which houses two vertical-propeller-type hydroelectric generators with approximately 30.8 MW total licensed capacity, and a gate house which provides water to the tri-level canal system.

Fish Passage

The Holyoke Dam is the first dam encountered by fish migrating up the Connecticut River to spawn. Fish-passage facilities include a fish lift that provides passage for upstream migration serving the project tailrace and a Bascule gate with a weir to allow water flow into the bypass reach and to provide for downstream fish migration. An attraction water system draws water from the First Level Canal and serves both fish lifts. The two fish lifts discharge into a common exit flume, where a counting room is located between the lifts and the exit.

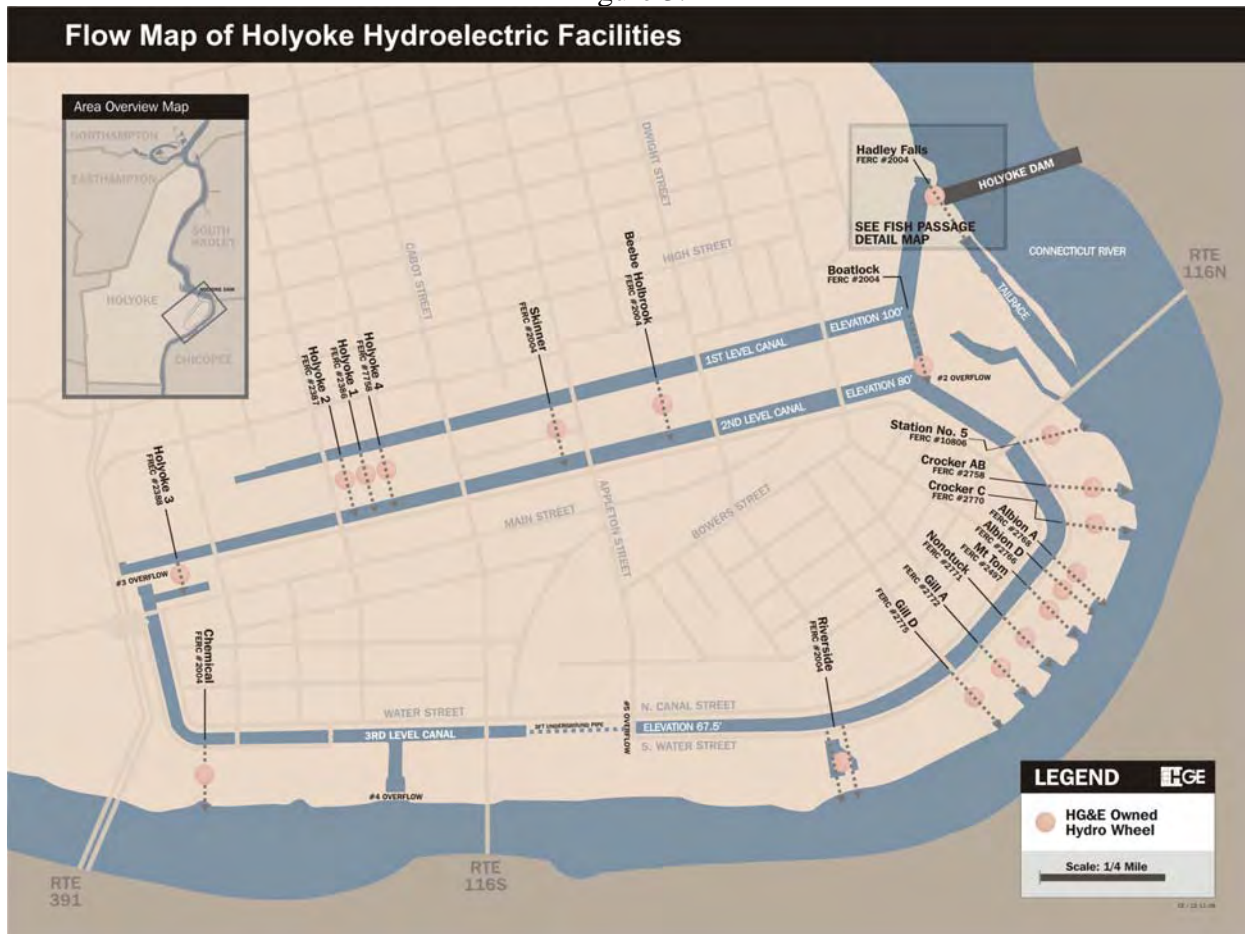
There is also an angled louver assembly located in the entrance to the canal system, which acts as an exclusionary device to the canal system and provides passage through a pipe for downstream fish migration. This assembly is located at the canal system entrance just downstream from the gate house (Figure 2). HG&E oversaw the installation of a new rubber dam crest at the Hadley Falls facility during the summer of 2001. This new inflatable crest allows more precise control of the water levels upstream of the dam during the migration season and plays an import role in the overall Project operation including upstream fish migration.

Figure 2



5B. The Canal System

Figure 3.



The Canal System consists of three levels referred to as the First, Second, and Third Level Canals (see Figure 3 above). The typical water surface elevations of the Canals are 97.47 feet, 77.47 feet and 64.97 feet (NGVD), respectively. At all times the flow entering each level of the Canal System is balanced with the flow ultimately returned to the lower level of the Canal System and/or the River. Canal inflow is directed back to the River or to the next Canal Level through the separate generating stations, water conduits and overflow structures,¹ and through leakage. The Canal System begins with the canal gatehouse structure located between the Hadley Falls Station and the western shore of the River. The gatehouse discharges water into the First Level Canal. The No. 1 Overflow structure, which is located immediately downstream of the gatehouse, discharges water directly back into the River.

¹ Note that the structures designated as “overflow structures” (i.e., No. 2 Overflow, No. 3 Overflow, and No. 4 Overflow) do not pond any water – they maintain the stable elevation of the respective Canal Level.

The First Level Canal is over a mile long and discharges water into the Second Level Canal through nine separate hydroelectric generating stations located along its length; seven of these stations are currently operational. The generating stations on the First Level Canal are: Boatlock, Beebe-Holbrook, and Skinner; Holyoke No. 1; Holyoke No. 2; and Holyoke No. 4. The First Level Canal also includes two projects which are not licensed by FERC and are not part of this application [the Open Square Station.² (also known as Aubin or Anitec) and the out-of-service Parsons Station² and includes the location of the former unlicensed, out of service Xidex Station.².

The Second Level Canal is over 2 miles long and includes twelve generating stations (seven are in-service), the No. 2 Overflow structure that discharges into the Hadley Falls Station tailrace, the No. 3 Overflow, and a pipe that discharges into the Third Level Canal. The following stations (all licensed by FERC) are located on the Second Level Canal and discharge into the River: Riverside 4-7, Riverside 8, Station 5/Valley, Crocker Mill AB Project (not in this application as currently not in-service), Crocker Mill C Project (not in this application as currently not in-service), Albion Mill D Project, Albion Mill A Project, Mt. Tom Mill Project (not in this application as currently not in-service), Nonotuck Mill Project (not in this application as currently not in-service), Gill Mill A Project (not in this application as currently not in-service) and Gill Mill D Project. The Holyoke No. 3 Station is located on the Second Level Canal and discharges to the Third Level Canal.

The Third Level Canal, approximately 4000 feet long, is supplied with water from the Holyoke 3 Station and the No. 3 Overflow. It is located largely at the low-lying southern end of the Canal System, mostly parallel to the bank of the River. The Third Level Canal includes the No. 4 Overflow structure located between the Canal System and the River. The Chemical Station (included in this application) and the Sonoco Station (not licensed by FERC) are located on the Third Level Canal and discharge into the River.²

5C. HG&E Existing Small Hydro Facilities

The following fourteen (14) HG&E existing small hydroelectric facilities are located on the Canal System as defined under section 5B and are made part of this application request.

1. Beebe Holbrook Station --FERC Project No. 2004

Beebe Holbrook Station is located between the First and Second Levels of the Canal nearly one-half mile (*i.e.*, 2000 feet) south of the Boatlock Station. The Station, constructed in the late 1940's, includes a 7-foot steel penstock and a powerhouse with one .250 MW vertical-axis Francis generating unit. The powerhouse is a concrete superstructure in an L-shape, approximately 126 feet long

² These small hydroelectric stations are not owned by HG&E.

and a width of 42 feet.

2. Boatlock Station--FERC Project No. 2004

The Boatlock Station is located between the First and Second Levels of the Canal. The Station was constructed in the 1920's and includes intake structures, a powerhouse with three generating units, and a canal feedwater system with 6 Canal feed gates. Each generating unit has an open, concrete flume extending from the Canal to the powerhouse. The intake structures are integral with the powerhouse structure. The powerhouse is a brick superstructure, L-shaped, that is approximately 120 feet long and from 42 to 60 feet wide. The three generating units are all vertical-axis Francis units and have an installed capacity of 0.700 MW, 1.2 MW and 1.330 MW.

3. Chemical Station--FERC Project No. 2004,

The Chemical Station is located on the Third Level of the Canal and discharges into the River about 3,400 feet south of the Boston & Maine Railroad Bridge. The Station includes 2 generating units, two intake flumes, the generating units, and 2 tailrace flumes to the River. The 2 generating units are located in a concrete and brick industrial building which is not owned by HG&E and not part of the Project 2004 License; HG&E holds the land rights for the land on which the generating units are located. The generating units at this Station both have an installed capacity of 0.800 MW and were installed in 1935.

4. Riverside 4-7 Station--FERC Project No. 2004

The Riverside 4-7 Station (which became operational in 1921) is located on the Second Level of the Canal and discharges into the River about 3500 feet north of the Boston & Maine Railroad Bridge. The Station is 105-foot long, 58 feet wide and 24 feet high. The Station includes a powerhouse constructed of concrete substructure and a brick superstructure, as part of building that also houses retired stream generators. The portion of the Station housing the hydroelectric equipment is approximately 105 feet by 58 feet (and 24 feet high). The 4 generating units, Riverside 4 through 7, have an installed capacity of 0.880 MW, 0.600 MW, 0.600 MW and 1.560 MW, respectively. The Riverside 6 unit has been partially dismantled and placed in deactivated reserve status; therefore the Application for the Riverside 4-7 Station does not include the Rated Capacity for Riverside 6. The intake structure for the Station covering the Riverside 4-7 units is integral with the forebay wall. The penstocks for Riverside 4, 5 and 6 are each 11 feet in diameter and approximately 72 feet from the intake to the powerhouse. The penstock for Riverside 7 consists of two 9 feet wide, 9 feet high, and 84-foot long arched tunnels. Riverside units 4, 5 and 6 have discharge tunnels that are approximately 15-feet wide, 10-feet high and 60-feet long, discharging directly into the River. Riverside 7 also discharges directly into the River through a tunnel.

5. Riverside 8 Station--FERC Project No. 2004

The Riverside 8 Station (which became operational in 1931) is located on the Second Level of the Canal and also discharges into the River. The Station includes a 136-foot long concrete penstock consisting of two rectangular conduits of 12.5-feet wide and 12.5-feet high. The powerhouse is a concrete substructure and a brick superstructure that is approximately 47 feet long, 35 feet wide and 31 feet high. The Riverside 8 generating unit has an installed capacity of 4 MW. As acknowledged in the 1999 FERC License, the Riverside 8 powerhouse is entirely separate from the Riverside 4-7 station (*see* 88 FERC ¶ 61,186 at page 61,621).

6. Skinner Station--FERC Project No. 2004

The Skinner Station is located on the First Level of the Canal, discharging into the Second Level of the Canal, approximately 1/3 miles south of the Boatlock Station. The Skinner Station (installed in 1924) includes an intake structure, penstock, generating unit, and tailrace flume. The intake is in the wall of the First Level of the Canal, constructed of stone and masonry, and has a 9-foot diameter steel penstock extending approximately 150 feet to the powerhouse. The generating unit is housed in a concrete and brick industrial building complex which is not part of the Holyoke Project and which is not owned by HG&E. A concrete arch (17-feet wide and 12-feet high) extends approximately 160 feet from the powerhouse to the Second Level of the Canal. There is one .300 MW vertical axis Francis unit at this Station.

7. Valley Hydro (Station No. 5) --FERC Project No. 10806

Valley Hydro (Station No. 5) is a Run-of-River project facility located on the Second Level Canal and became operational in 1994. Holyoke Gas & Electric Department acquired this project in late 2004 due to the termination of a lease. This project is not connected to any other hydroelectric project. It is physically and electrically separate. The Station includes two 75 foot long, 6.5 foot diameter steel penstocks. There is a 16.5 foot-wide by 11 foot high arched brick-lined tailrace tunnel extending 375 feet long where the tailwater empties into the Connecticut River. The Valley Hydro (Station No. 5) generating unit has an installed capacity of 0.790 MW.

Harris Energy

Harris Energy consists of eight separate Run-of-River project facilities located on the Second Level Canal that discharge into the river. HG&E acquired these projects in 2004 from Harris Energy and Realty Corporation. Each project has a separate FERC License and is physically and electrically separate. Each contains its own intake, penstock, powerhouse and tailrace facilities (as documented in the respective FERC License orders.) These Facilities are represented as a single NEPOOL asset. One totalizer reports combined totals of six separate metered generation and station service points. Only three of the eight hydro power projects are currently active. The total installed capacity of the three hydro projects is 1.262 MW. Crocker Mill AB, Crocker Mill C, Gill Mill A, Mt. Tom Mill and Nonotuck

Mill are currently inactive and not included in this application.

➤ **8. Albion Mill A Project -- FERC Project No. 2768**

Albion Mill A Project is located on the Second Level Canal and became operational in 1919. The Station includes a 180-foot long penstock. The tailrace arch brick-lined tunnel is 16-foot wide by 9 foot-high and 260 feet long. The Albion Mill A Project generating unit has an installed capacity of 0.312 MW.

➤ **9. Albion Mill D Project -- FERC Project No. 2766**

Albion Mill D Project is located on the Second Level Canal and became operational in 1919. The Station includes a 190-foot long, 9 foot diameter steel penstock. The tailrace arch brick-lined tunnel is 9-foot wide by 12 foot-high and 250 feet long. The Albion Mill D Project generating unit has an installed capacity of 0.500 MW.

➤ **10. Gill Mill D Project -- FERC Project No. 2775**

Gill Mill D Project is located on the Second Level Canal and became operational in 1919. The Station includes a 295-foot long, 12 foot diameter steel penstock. The tailrace arch brick-lined tunnel is 7-foot wide by 10 foot-high. The Gill Mill D Project generating unit has an installed capacity of 0.450 MW.

HG&E Hydro/Cabot 1-4

HG&E Hydro/Cabot 1-4 consists of four separate Run-of-River project facilities totaling 2.681 MW. Each project has a separate FERC License and is physically and electrically separate. Each contains its own intake, penstock, powerhouse and tailrace facilities (as documented in the respective FERC License orders.) These Facilities are represented as a single NEPOOL asset. One totalizer reports combined totals of four separate metered generation and station service points.

➤ **11. Holyoke No. 1 -- FERC Project No. 2386**

Holyoke No. 1 is located on the First Level Canal and became operational in 1923. The project includes a brick powerhouse that measures 38 feet by 50 feet and contains two generators. Water is delivered to and from the turbines by two 32 foot long, 10 foot diameter steel penstocks and two 320 foot long brick tailraces respectively. The Holyoke No. 1 total installed capacity is 1.056 MW.

➤ **12. Holyoke No. 2 -- FERC Project No. 2387**

Holyoke No. 2 is located on the First Level Canal and became operational in 1923. The project includes two parallel 240-foot long, 9 foot diameter steel penstocks, and a 17 foot high and 10 foot diameter surge tank. The powerhouse measures 60 feet long and 40 feet wide and contains one generator with an installed capacity of 0.800 MW. Two parallel brick-

lined arched tailrace tunnels, each 9-foot wide by 10 foot-high and 250 feet long discharge into the Second Level Canal.

➤ **13. Holyoke No. 3 -- FERC Project No. 2388**

Holyoke No. 3 is located on the Second Level Canal and became operational in 1923. This project includes a 47 foot long trashrack, two headgates about 11 feet square, two low pressure brick penstocks about 85 feet long, a concrete powerhouse containing one generator unit rated with an installed capacity of .0450 MW. The open tailrace of 118 feet long and 29.7 feet wide discharges into the Third Level Canal.

➤ **14. Holyoke No. 4 -- FERC Project No. 7758**

Holyoke No. 4 is located on the First Level Canal and became operational in 1923. The project includes two 76-foot long, 7 foot diameter steel penstocks. The powerhouse contains two generator units (.375 MW each) with a total rated installed capacity of 0.750 MW (one generating unit is out of service and not part of this application) on the first floor of the three story building. Two 13 foot wide and 300 foot long tailraces discharge into the Second Level Canal.

6. NOT A BIOMASS SOURCE

7. REGULATORY APPROVALS

Federal Energy Regulatory Commission (FERC) commonly treats multiple hydroelectric generating facilities, even those located at different generating stations, under a single license.

FERC Project No. 2004 includes the 30-foot-high, 985 foot long Hadley Falls Dam (topped by five 3.5-foot high inflatable rubber dam sections), the impoundment behind the dam, the Hadley Falls Station (not included in this application), upstream and downstream fish passage facilities, the three-level Holyoke Canal System adjacent to the Connecticut River, and the Canal Stations Beebe Holbrook, Boatlock, Chemical, Riverside 4-7, Riverside 8 and Skinner included in this application. (The FERC License discusses Riverside as a combined facility covering both Riverside 4-7 and the separate powerhouse Riverside 8.)

In 1999, Canal Stations were licensed by FERC under the Federal Power Act (FPA) initially to Holyoke Water Company (HWP), Holyoke Gas & Electric Department's (HG&E) predecessor. HG&E acquired the Project No. 2004 from HWP in December 2001. The 1999 FERC License was transferred to HG&E by FERC order issued September 20, 2001 (96 FERC ¶ 62,283). Based on extensive negotiations to resolve issues pending from the 1999 FERC License, HG&E filed a comprehensive settlement co-sponsored by Federal and State resource agencies and other stakeholders. The joint settlement agreement contained proposed modifications to the license articles in the 1999 FERC License and incorporated the

final Water Quality Certification issued by Massachusetts Department of Environmental Protection on February 14, 2001. By order issued April 19, 2005 (111 FERC ¶ 61,106), FERC approved the settlement and modified the license articles. The revised license articles did not result in substantial changes to the license requirements and the description of the facilities included in the Holyoke Project No. 2004 was not modified.

The manner in which FERC licensed the other jurisdictional hydroelectric generating stations on the Canal System is a demonstration of the flexibility applied in defining the scope of a license, depending on how the application was submitted. Based on separate applications filed by Harris' predecessors, FERC issued separate licenses for the eight Harris facilities on the Second Level of the Canal, *i.e.*, for the Crocker Mill A and B Project [FERC Project No. 2758, 47 FERC ¶ 62,305 (1989)]; the Crocker Mill C Project [FERC Project No. 2770, 47 FERC ¶ 62,309 (1989)]; the Albion Mill D Project [FERC Project No. 2766, 47 FERC ¶ 62,307 (1989)]; the Albion Mill A Project [FERC No. 2768, 47 FERC ¶ 62,298 (1989)]; the Mt. Tom Mill Project [FERC Project No. 2497, 47 FERC ¶ 62,308 (1989)]; the Nonotuck Project [FERC Project No. 2771, 47 FERC ¶ 62,304 (1989)]; the Gill Mill A Project [FERC Project No. 2772, 47 FERC ¶ 62,303 (1989)]; and the Gill Mill D Project [FERC Project No. 2775, 47 FERC ¶ 62,297 (1989)].

As further example, on the First Level of the Canal, FERC has separately licensed the Holyoke No. 1 Project [FERC Project No. 2386, 46 FERC ¶ 62,229 (1989)]; the Holyoke No. 2 Project [FERC Project No. 2387, 44 FERC ¶ 62,310 (1988)]; the Holyoke No. 3 Project [FERC Project No. 2388, 44 FERC ¶ 62,309 (1988)]; and the Holyoke No. 4 Project [FERC Project No. 7758, 38 FERC ¶ 62,270 (1987), which has undergone relicensing as a separate project [FERC Project No. 7758, 111 FERC ¶ 62,128 (2006),]. On the Second Level of the Canal, FERC has also separately licensed the Station 5/Valley Project [FERC Project No. 10806, 51 FERC ¶ 62,314 (1990)].

As described in the 1999 FERC License and the underlying application for that License, the Canal Stations are separate facilities – containing separate intakes off of different levels of the Canal System, separate generating units, and separate tailraces either to another level of the Canal System or to the River. Further, the Canal Stations are not in close proximity to each other – sometimes a mile or more apart.

- FERC Project, License Number and Water Quality Certification information for the eligible Class IV facilities listed in this application are presented in Appendix A – Facility Information Table.
- Supporting FERC licenses under which HG&E operates its eligible Class IV resources are included in Appendix B – FERC Operating Licenses
- Supporting Water Quality Certificates are included in Appendix C – Water

Quality Certificates.

8. PROOF OF APPROVED INTERCONNECTION STUDY

- No modifications or changes to the existing interconnection systems at any of the eligible Class IV facilities listed in this application are planned or needed. HG&E's existing small hydro facilities are all interconnected via distribution feeders into substations that are owned and maintained by HG&E.

9. NOT A BIOMASS FACILITY

10. DESCRIPTION OF HOW CONNECTED TO DISTRIBUTION UTILITY

- HG&E is the owner of the distribution facilities for all of the eligible Class IV hydroelectric stations listed in this application.
- The point of interconnection is listed in Appendix A – Facility Information Table.

11. OTHER STATE CERTIFICATION STATEMENT

- Connecticut Class II Certification Number and eligibility date information is presented in Appendix A – Facility Information Table for each of the existing small hydro facilities presented under this application.
- Supporting Connecticut DPUC Decisions are presented in Appendix D – Connecticut DPUC Decisions.
- Rhode Island Existing Certification Number and eligibility date information is presented in Appendix A – Facility Information Table for each of the existing small hydro facilities presented under this application.
- Supporting Rhode Island PUC Decisions are presented in Appendix E – Rhode Island PUC Decisions.
- Each of HG&E's existing small hydro facilities presented under this application are also certified as Maine Renewable. As these assets were grandfathered prior to Maine's new application process. No separate documentation exists.

12. ISO-NEW ENGLAND OUTPUT VERIFICATION STATEMENT

- All of the eligible Class IV hydroelectric stations listed in this application are located and registered within the NEPOOL Control area. All renewable energy is settled in the ISO-New England Market Settlement System.

13. NOT APPLICABLE

14. AFFIDAVIT OF ACCURACY

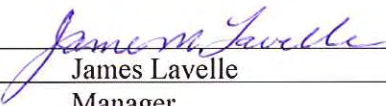
- The undersigned hereby certifies that all information provided in this application is accurate.

15. FACILITY OPERATOR

The facility Operator and Owner are the same as the Applicant as previously stated in item #1.

16. OTHER INFORMATION

Available upon request as needed.

By: 
Name: James Lavelle
Title: Manager
Date: 5/28/10

Holyoke Gas & Electric Department Facility Information Table																	
Facility Name	Commercial Operation Date	Gross Name Plate Capacity (MW)	Water Quality Certification	ISO-NE Asset ID	NEPOOL GIS Facility Code	FERC Project Number	FERC License Number	FERC License Issuance Date	River	Grid Voltage at Point of Interconnection	Station Address	Latitude	Longitude	CT Class II CERT #	Date Eligibility	RI Existing CERT #	Date Eligibility
Beebe Holbrook Station	January 1, 1948	0.250	February 14, 2001	812	MSS812	2004	88 FERC 61,186 (1999 FERC License)	August 20, 1999	1st Level Canal	13.8 kV	388 Dwight St, Holyoke, MA 01040	+42° 12' 18.05"	-72° 36' 14.83"	CT00099-04	April 1, 2004	RI-4126-E10	February 1, 2010
							96 FERC 62, 283 (Transfer of License)	September 20, 2001									
							111 FERC 61,106 (Revised License per Settlement Agreement)	April 19, 2005									
Boatlock Station	January 1, 1924	3.230	February 14, 2001	859	MSS859	2004	88 FERC 61,186	August 20, 1999	1st Level Canal	13.8 kV	28 Gatehouse Rd, Holyoke, MA 01040	+42° 12' 31.91"	-72° 36' 1.06"	CT00100-04	April 1, 2004	RI-4124-E10	February 1, 2010
							96 FERC 62, 283 (Transfer of License)	September 20, 2001									
							111 FERC 61,106 (Revised License per Settlement Agreement)	April 19, 2005									
Chemical Station	January 1, 1935	1.600	February 14, 2001	862	MSS862	2004	88 FERC 61,186	August 20, 1999	3rd Level Canal	13.8 kV	228 South Water St., Holyoke, MA 01040	+42° 11' 31.96"	-72° 36' 31.19"	CT00101-04	April 1, 2004	RI-4120-E10	February 1, 2010
							96 FERC 62, 283 (Transfer of License)	September 20, 2001									
							111 FERC 61,106 (Revised License per Settlement Agreement)	April 19, 2005									
Riverside 4-7 Station	January 1, 1921	3.040	February 14, 2001	1034	MSS1034	2004	88 FERC 61,186	August 20, 1999	2nd Level Canal	13.8 kV	30 Water St., Holyoke, MA 01040	+42° 12' 2.90"	-72° 35' 39.61"	CT00103-04	April 1, 2004	RI-4125-E10	February 1, 2010
							96 FERC 62, 283 (Transfer of License)	September 20, 2001									
							111 FERC 61,106 (Revised License per Settlement Agreement)	April 19, 2005									
Riverside 8 Station	January 1, 1931	4.000	February 14, 2001	1035	MSS1035	2004	88 FERC 61,186	August 20, 1999	2nd Level Canal	13.8 kV	30 Water St, Holyoke, MA 01040	+42° 12' 3.82"	-72° 35' 38.31"	CT00104-04	April 1, 2004	RI-4121-E10	February 1, 2010
							96 FERC 62, 283 (Transfer of License)	September 20, 2001									
							111 FERC 61,106 (Revised License per Settlement Agreement)	April 19, 2005									
Skinner Station	January 1, 1924	0.300	February 14, 2001	878	MSS878	2004	88 FERC 61,186	August 20, 1999	1st Level Canal	13.8 kV	64 Bigelow St., Holyoke, MA 01040	+42° 12' 10.30"	-72° 36' 26.57"	CT00105-04	April 1, 2004	RI-4123-E10	February 1, 2010
							96 FERC 62, 283 (Transfer of License)	September 20, 2001									
							111 FERC 61,106 (Revised License per Settlement Agreement)	April 19, 2005									
Albion Mill A	January 1, 1919	0.312	CWA Section 401-3/30/1989	12168 Harris Energy	MSS12168	2768	47 FERC 62,298	June 29, 1989	2nd Level Canal	13.8 kV	15 Water St., Holyoke, MA 01040	+42° 12' 31.02"	-72° 35' 37.21"	CT00266-08A	June 1, 2008	RI-4127-E10	February 1, 2010
Albion Mill D	January 1, 1919	0.500				2766	47 FERC 62,307	June 29, 1989	2nd Level Canal	13.8 kV	15 Water St., Holyoke, MA 01040	+42° 12' 30.69"	-72° 35' 36.79"	CT00266-08B	June 1, 2008		
Gill Mill D	January 1, 1919	0.450				2775	47 FERC 62,297	June 29, 1989	2nd Level Canal	13.8 kV	28 Water St., Holyoke, MA 01040	+42° 12' 17.44"	-72° 35' 34.13"	CT00266-08D	June 1, 2008		
Total	January 1, 1919	1.262															
Holyoke No. 1	January 1, 1923	1.056	CWA Section 401-8/24/1987	957 HG&E Hydro/ Cabot 1-4	MSS957	2386	46 FERC 62,229	February 28, 1989	1st Level Canal	4.8 kV	104 Cabot St, Holyoke, MA 01040	+42° 12' 1.10"	-72° 36' 37.39"	CT00102-04	April 1, 2004	RI-4119-E10	February 1, 2010
Holyoke No. 2	January 1, 1923	0.800	CWA Section 401-3/30/1987			2387	44 FERC 62,310	September 28, 1988	1st Level Canal	4.8 kV	83 Sargent St, Holyoke, MA 01040	+42° 11' 56.02"	-72° 36' 39.20"	CT00102-04B	April 1, 2004		
Holyoke No. 3	January 1, 1923	0.450	CWA Section 401-7/14/1987			2388	44 FERC 62,309	September 28, 1988	2nd Level Canal	4.8 kV	250 South Race St, Holyoke, MA 01040	+42° 11' 43.02"	-72° 36' 46.49"	CT00102-04C	April 1, 2004		
Holyoke No. 4	January 1, 1923	0.375	Waived due to Certified under Project No. 2004			7758	38 FERC 62,270 111 FERC 62,128 Subsequent License	March 19, 1987 August 15, 2006	1st Level Canal	4.8 kV	100 Cabot St, Holyoke, MA 01040	+42° 12' 2.03"	-72° 36' 36.15"	CT00102-04D	April 1, 2004		
Total		2.681															
Valley Hydro (Station No. 5)	November 1, 1994	0.790	CWA Section 401-8/16/1989	14623	MSS14623	10806	51 FERC 62,314 111 FERC 62,317 Transfer of license	June 29, 1990 June 22, 2005	2nd Level Canal	4.8 kV	4 Valley Mills Road, Holyoke, MA 01040	+42° 12' 32.65"	-72° 35' 45.60"	CT00100-06	December 1, 2005	RI-4122-E10	February 1, 2010

- 88 FERC 61,186 – Project 2004 License
- 96 FERC 62,283 – Project 2004 Transfer of License
- 111 FERC 61,106 – Project 2004 Settlement Agreement
- FERC 2768 -- ALBION MILL A
- FERC 2766 -- ALBION MILL D
- FERC 2772 -- GILL MILL D
- FERC 2386 -- HOLYOKE NO. 1
- FERC 2387 -- HOLYOKE NO. 2
- FERC 2388 -- HOLYOKE NO. 3
- FERC 7758 -- HOLYOKE NO. 4
- FERC 10806 -- VALLEY HYDRO (STATION NO. 5)

88 ferc ¶ 61,186
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: James J. Hoecker, Chairman;
Vicky A. Bailey, William L. Massey,
Linda Breathitt, and Curt Hébert, Jr.

Holyoke Water Power Company

Project No. 2004-073

Holyoke Gas & Electric
Department, Ashburnham
Municipal Light Plant, and
Massachusetts Municipal
Wholesale Electric Company

Project No. 11607-000

ORDER ISSUING NEW LICENSE AND
DENYING COMPETING LICENSE APPLICATION

(Issued August 20, 1999)

The 43.8-megawatt (MW) Holyoke Hydroelectric Project is located on the Connecticut River in Hampden, Hampshire, and Franklin Counties, Massachusetts.¹ On September 2, 1997, the licensee, Holyoke Water Power Company (Holyoke Power),² filed an application for a new license for the project.³ A competing

1/ The Holyoke Project is required by Section 23(b)(1) of the Federal Power Act to be licensed, because the Connecticut River at the project site is a navigable water of the United States. See Holyoke Water Power Company, 8 FPC 471, 477 (1949), citing In the Matters of Bellows Falls Hydroelectric, et al., 2 FPC 381, 938 (1941).

2/ Holyoke Power is a subsidiary of Northeast Utilities, an electric utility holding company that provides electric service to about 1.7 million customers through operating subsidiaries in Western Massachusetts, New Hampshire, and Connecticut.

3/ The competing applicants (Municipalities) argue that Holyoke Power's application was not timely. Filing of September 30, 1997. Section 15(c)(1) of the Federal Power Act (FPA) provides that each application for a new license shall be filed with the Commission at least 24 months before the expiration of the term of the existing license. 16 U.S.C. § 808(c)(1). August 31, 1997, 24 months before the expiration of the original license, fell on a Sunday, and the next day, September 1, was Labor Day. September 2, 1997, the day Holyoke Power's application was

license application was filed by the Holyoke Gas & Electric Department of the City of Holyoke (HG&E); Ashburnham Municipal Light Plant (Ashburnham); and the Massachusetts Municipal Wholesale Electric Company

filed, was the first day after August 31, 1997, that the Commission was open to receive filings. Under Rule 2007 of the Commission's Rules of Practice and Procedure, Holyoke Power's filing was timely. 18 C.F.R. § 385.2007 (1999).

(MMWEC) (collectively, Municipalities.) ⁴

For the reasons discussed below, we will issue a new license to Holyoke Power and deny Municipalities' competing application.

BACKGROUND

In response to published notice of Holyoke Power's license application (Project No. 2004), motions to intervene were filed by the Town of South Hadley, Massachusetts; ⁵ Trout Unlimited; Connecticut River Watershed Council; Holyoke DAM Committee; U.S. Department of the Interior (Interior); U.S. Environmental Protection Agency (EPA); Commonwealth of Massachusetts; the National Marine Fisheries Service (NMFS); Connecticut River Atlantic Salmon Commission; HG&E; and City of Holyoke. All but one of the motions to intervene were timely and uncontested and thus automatically granted under Rule 214 of the Commission's Rules of Practice and Procedure. ⁶ The City of Holyoke filed a late motion, which was uncontested and will be granted. All these same parties moved to intervene with respect to the competing application (Project No. 11607), except the City of Holyoke. In addition, Holyoke Power moved to intervene. These motions were timely and uncontested and therefore automatically granted.

On January 28 and 29, 1998, the Commission staff conducted meetings in the City of Holyoke in order to determine the scope of issues to be addressed in the environmental document to be prepared for this proceeding. On August 25, 1998, the staff convened another public meeting in the City of Holyoke to consider arguments regarding which of the two competing applications presents the better adapted plan, and to entertain further comments on the environmental issues to be addressed.

4/ Ashburnham and MMWEC amended the application on January 30, 1998, to include HG&E. Ashburnham and HG&E are municipal electric departments. MMWEC is a corporate and political subdivision of the State of Massachusetts, with cities and towns as members, which is empowered to own and operate electric power facilities, and buy and sell power on behalf of its members. Under the amended application, HG&E would own and operate the project, Ashburnham would have a right to a portion of the project output, and MMWEC would provide services in marketing the project output.

5/ One end of the project's dam is in the City of Holyoke, the other is in the Town of South Hadley.

6/ 18 C.F.R. § 385.214 (1999).

The Commission staff issued a Draft Environmental Impact Statement (Draft EIS) on the competing applications on April 16, 1999. It received written and oral comments thereon at a public meeting in Holyoke on May 26, 1999, as well as written comments from Interior, Interior's Fish and Wildlife Service (FWS), NMFS, Connecticut River Watershed Council, Holyoke Power, HG&E, Connecticut River Atlantic Salmon Commission, Trout Unlimited, et al., Town of South Hadley, EPA, Massachusetts Departments of Fisheries and Wildlife (Massachusetts DFW) and Environmental Management (DEM), Twenty Fivers, Inc., Holyoke DAM Committee, City of Holyoke Mayor's Office and City Councillor Helen Norris, State Representative Nancy Flavin, and Mary Virginia Rickel.

On the basis of these comments, and further analysis of the entire record in these proceedings, the Commission staff prepared a Final EIS, issued July 27, 1999.

PROJECT DESCRIPTION ⁷

The Holyoke Project, originally licensed in 1949, ⁸ consists of a 30-foot-high, 985-foot-long dam (topped by 3-foot-high wooden flashboards) that impounds a 2,290-acre reservoir with a normal maximum surface elevation of 100.6 feet National Geodetic Vertical Datum; a three-level canal system extending through the lower areas of the City of Holyoke and providing water for industrial and hydropower generation; ⁹ six hydroelectric generating stations; and fish passage facilities at five locations.

The project regulates Connecticut River flows by means of releases through the Hadley Falls generating station and the Holyoke Canal Gatehouse, both located at the south abutment of the dam. All other river flows are passed over the dam. Flows diverted through the gatehouse into the canal system are returned to the river through various "overflows" (masonry spillways). Flows passed through the Hadley Falls station (which can accommodate up to about 8,800 cubic feet per second (cfs) are discharged into a 2,750-foot-long tailrace, a walled channel between the shore and the stream bed.

The existing license requires the release of a continuous minimum flow from the project of 1,660 cfs, or inflow, whichever

^{7/} For a more detailed description, see ordering paragraph (E) of this order and the Final EIS at pp. 2-1 through 2-13.

^{8/} 8 FPC 471, 490-92.

^{9/} The hydropower stations on the canal system generate by use of water flowing from a higher elevation canal to a lower canal, or from a canal into the Connecticut River.

is less. Of this flow, 560 cfs is released into the canals; the remaining 1,100 cfs is released from the Hadley Falls station into the tailrace. When inflows to the project fall below 1,100 cfs, the available flow is released through the Bascule gate into the bypassed reach.¹⁰

The project is currently operated in a daily peaking mode, i.e., daily storage capacity is used for peak load generation. Pool elevations are allowed to fluctuate below normal pool elevation as much as 1.5 feet, and elevations are occasionally drawn down as much as 3.0 feet from the crest of the flashboards.

There are two fishlifts at the Holyoke (south) end of the dam, one serving the tailrace, the other serving the project's bypassed reach.¹¹ Both fishlifts dump into a common exit flume (ending by the canal gatehouse), along which are a fish-counting station and trapping facility.

Anadromous fish are also passed downstream through the Bascule gate, which discharges into the bypassed reach. Downstream migrants that enter the canal system are guided by a permanent louver array in the first level of the canal to a steel pipe, which transports them to a sampling facility adjacent to the tailrace, and then discharges them into the tailrace. During seasons when Atlantic salmon smolt are migrating downstream, Holyoke Power installs 10-foot-deep overlays over the intakes for the Hadley Falls Station to divert the smolts toward the spillway for safe passage downstream.

DESCRIPTION OF COMPETING PROPOSALS

A. Holyoke Power's Relicensing Proposal

Holyoke Power does not propose to expand the generating capacity of the existing project, but does propose to replace the existing three-foot-high wooden flashboards with an inflatable rubber dam system, institute run-of-river operation, and provide minimum flow releases to the bypassed reach. Holyoke Power would maintain the impoundment elevation at 100.6 feet, with a

^{10/} The 25-foot-wide by 8.5-foot-high Bascule gate, located adjacent to the abutment on the south side of the dam, is used to pass ice and debris, and for downstream fish passage. A Bascule gate is a flat, counterbalanced gate which is hinged at the bottom edge and is lowered by tipping it in the downstream direction to the extent necessary to allow the desired amount of water to flow past.

^{11/} Each fishlift consists of an entrance, crowding bay, lift bucket, and lift elevator.

fluctuation of ± 0.2 foot, rather than the ± 0.5 -foot fluctuation proposed by Municipalities.¹² The minimum flow into the bypassed reach would be 420 cfs, or inflow, whichever is less, adjusted to 800 cfs from April 1-July 15 to operate upstream and downstream fish passage facilities.

Holyoke Power also proposes to improve its existing upstream fishlift system, by modifying the existing trapping facility in the counting station, expanding the capacity of the fishlift system when the numbers of upstream migrating American shad and herring warrant the expansion, and modifying the method for determining the frequency of fishlift operations. Holyoke Power also proposes to install a transport system ("flyover") from the Bascule gate to the tailrace to improve the effectiveness of the spillway fishlift,¹³ and install an upstream passage facility for American eels on the South Hadley side of the dam.

Holyoke Power proposes to operate the canal system in a manner similar to its current operation. It would however maintain a larger wetted area in parts of two canals during drawdowns and perform maintenance drawdowns during cooler months, measures which would alleviate adverse impacts from drawdowns on the canals' fish and mussel populations.

Holyoke Power's proposal also includes the provision of eagle nesting platforms, the development of a Cultural Resources Management Plan under the terms of a Programmatic Agreement with the Massachusetts Historical Commission, the provision of additional public access to the river on properties owned by Holyoke Power, and an annual contribution of \$5,000 for channel marking in the impoundment. Holyoke Power would also commit to consider proposals of a local committee to participate in the development of a Holyoke Canal walkway on property along the canal owned by Holyoke Power, and to transfer, or grant conservation restrictions to a state agency to manage approximately 700 feet of undeveloped river frontage which it owns below the dam in South Hadley. This river frontage could be developed for nature study, sightseeing, picnicking, and hiking (although Holyoke Power does not propose to pay for such development). Holyoke Power also proposes to grant conservation restrictions to a state agency to prohibit future development of certain parcels it owns along the impoundment. Finally, Holyoke Power proposes to continue sponsoring an annual shad derby, and providing canoe portage around the dam.

12/ The inflatable rubber dam on the crest of the masonry dam, in lieu of the existing flashboards, will enable the licensee to maintain more stable impoundment elevations.

13/ Holyoke Power agreed to install the flyover in a 1990 Memorandum of Agreement with the Connecticut River Atlantic Salmon Commission.

B. Municipalities' Relicensing Proposal

Municipalities propose to construct a new powerhouse containing one 15-MW generating unit adjacent to the existing powerhouse, construct a new forebay and tailrace to accommodate the new powerhouse, thereby increasing the project's installed capacity to 58.756 MW.¹⁴ Construction of this proposed new capacity would not begin until 2004/2005 and would not be completed until 2006. Municipalities would also install an inflatable rubber dam atop the existing masonry dam, in lieu of the existing flashboards, and propose to have the rubber dam operable within a year of the acceptance of the license.

Municipalities also propose to operate the project in a run-of-river mode, although permitting impoundment levels to fluctuate ± 0.5 foot from the normal operating elevation, rather than the ± 0.2 foot fluctuations proposed by Holyoke Power. However, Municipalities do not propose to implement run-of-river operation until after the new generating unit is on line, several years from now. Municipalities propose to provide a year-round minimum flow of 420 cfs, or inflow if less, into the bypassed reach, to be supplemented with an additional 300 cfs in the spring and 500 cfs in the fall. Furthermore, Municipalities propose to maintain a base canal flow of 810 cfs (560 cfs for generation at the hydroelectric facilities on the canal, and 250 cfs for leakage).¹⁵

Municipalities propose to nearly double the capacity of the fishlift facilities, and to modify those facilities, as necessary, to permit their operation at higher flows (up to 40,000 cfs). This expansion would not be undertaken until construction of the new development. The existing spillway fishlift would be removed, redesigned, and reinstalled in connection with construction of the proposed new powerhouse.¹⁶ The existing downstream fish passage facilities would be replaced with a fish screen in the new forebay intended to prevent entry into the canal system, as well as the intake structure for the

14/ Municipalities also propose to construct new transmission and interconnection facilities, estimated to cost \$3.6 million, to connect the output of the project generators to HG&E's system.

15/ Flows for the canal would be subordinate to flows for the bypassed reach, fish passage facilities, and tailrace. During low-flow periods of the summer and early fall, little or no flows will be available for the canal.

16/ Municipalities propose to increase the capacity of the existing tailrace fishlift and propose several interim measures to increase the capacity of existing spillway fishlift, prior to installing the new spillway fishlift in connection with the new powerhouse.

turbines, and guide downstream migrants to a fish passage conduit which would transport them to a fish sampling station and discharge them into the tailrace. If the new fish screen proves to be effective in preventing downstream migrants from entering the canal, Municipalities propose to remove the existing louver system in the canal and eliminate the discharge through the bypass conduit from the louvers to the tailrace, as well as the bypass system and discharge into the tailrace from the Boatlock Station on the canal downstream from the louvers.¹⁷ Municipalities propose to construct two eel ladders, one at each end of the dam, rather than the one ladder proposed by Holyoke Power.

Municipalities propose to spend \$1 million to acquire various parcels from Holyoke Power, not within the current project boundary, for a canal walk along the Holyoke Canal, river front parks below the dam in Holyoke, and a regional trail/bikeway on the Holyoke side of the river below the dam. This land acquisition would be funded out of an initial issuance of revenue bonds to purchase the project from Holyoke Power.¹⁸ Municipalities also propose to contribute \$325,000 over ten years to start a fund to acquire land or conservation easements along the impoundment shoreline. In addition, Municipalities propose to develop a master plan at an estimated cost of \$50,000 to develop and manage Log Pond Cove on the impoundment.¹⁹

Municipalities propose various improvements to Fish Lift Park (adjacent to the Hadley Falls Power Station): improved signage, access roads, parking, picnic areas, and walkways, and improved viewing and educational opportunities at the fishway. Municipalities propose to install guide boards with maps at various sites along the impoundment, and to distribute free navigation maps. Municipalities also propose to provide a dam release warning system, and a communication system (e.g., a telephone hotline) to provide boaters information about water levels of the impoundment, contribute \$100,000 over ten years to the channel marking program, and provide \$200,000 to construct a boat ramp below the dam in South Hadley.

^{17/} Municipalities have stated that they would consider leaving the louver system in place, even after installation of the new fish screen, if the resource agencies believe the louver system is still needed.

^{18/} Municipalities' application, as amended January 30, 1998, Vol. I, p. D-13.

^{19/} Municipalities estimate that approximately \$300,000 per year will be available from the project's net operating income for their proposed recreational and environmental enhancement measures. Id. at p. D-15.

Most of the above proposals would be included as conditions of a license. However, Municipalities' application contains additional proposals that are beyond the scope of what would ordinarily be included in a license. For example, Municipalities propose to provide funds to improve several existing parks within the City of Holyoke, and maintain security at those parks. In addition, Municipalities propose to establish a Hadley Falls Development Trust, to be initially funded by \$2 million of the proceeds from the issuance of revenue bonds to acquire project property from Holyoke Power, and thereafter out of surplus revenues from the project, to be used for rate reduction, environmental and recreational programs, and economic redevelopment of the inner city.²⁰

EVALUATION OF COMPETING APPLICATIONS

Section 15(a)(2) of the FPA²¹ requires the Commission, in determining which proposal is better adapted to the public interest, to compare the licensing proposals of competing applicants with respect to the following: (1) plans and abilities to comply with the license; (2) plans for the safe management, operation, and maintenance of the project; (3) plans and abilities to provide efficient and reliable electric service; (4) applicant's need for power; (5) transmission service; (6) cost effectiveness of plans; and (8) other factors considered relevant by the Commission, except that an applicant's plans concerning fish and wildlife shall not be compared.²² The section further provides that "insignificant differences with regard to [these factors] shall not result in the transfer of a project [from the incumbent licensee]."

A. Sections 15(a)(2)(A), (B), and (C): Ability to Comply with the New License, Operate Project Safely, and Provide Efficient and Reliable Electric Service

It appears that both applicants have the ability to comply with any license issued for the Holyoke Project, operate the project safely, and provide efficient and reliable electric

20/ The Development Trust would also be used for development in South Hadley along the remains of an historic navigation canal. Municipalities anticipate that the Development Trust would receive grants and low-interest loans from a variety of state, federal and private sources, in addition to contributions from project surpluses. The Development Trust would be used to underwrite the Canal District Redevelopment Plan, which envisions, over a 25-year period, the redevelopment of 280 acres, with a public investment or subsidy of \$100,000 per acre.

21/ 16 U.S.C. § 808(a)(2).

22/ By filings of June 30, 1998, Holyoke Power and Municipalities each filed a statement (commonly referred to as a better-adapted statement) explaining how its proposal is superior to the plans of its competitor.

service. Holyoke Power and HG&E, the co-applicant for the competing proposal that would be responsible for project operation, are experienced hydroelectric project operators. Holyoke Power has owned and operated this project for nearly 140 years. Its parent company, Northeast Utilities, is also an experienced hydroelectric project operator.²³ Similarly, HG&E is licensee for five licensed hydroelectric projects along the Holyoke Canal.²⁴ That both applicants have a history of complying with the conditions of their respective licenses is further evidence of their ability to comply with the terms of the new Holyoke license.²⁵

Holyoke Power's and Municipalities' plans for operating the project safely and in compliance with the license are essentially the same. Holyoke Power currently operates and maintains the project with a crew of 23 employees, and maintains personnel at the gatehouse of the canal, near the powerhouse, on a 24-hour per day basis, with additional staff on call, near the project, at all times.²⁶ Municipalities have indicated that they will not make any material changes in safety procedures at the project.²⁷

B. Section 15(a)(2)(D): Applicants' Need for Power

Most of the power from the project is used for the regional power needs of Holyoke Power's parent company, Northeast Utilities. If Holyoke Power does not receive the new license for this project, the power lost to the Northeast Utilities system will have to be replaced by other units on the system or by purchases from outside the system.

HG&E is a wholesale customer of Holyoke Power. If Municipalities receive the project license, the project will continue to supply power to the City of Holyoke's retail customers. Surplus power will supply co-applicant Ashburnham's Municipal Light Plant or other MMWEC members or be sold for distribution elsewhere in New England.

23/ Northeast Utilities' subsidiaries own and operate 20 hydroelectric projects in New England. See Holyoke Power's better-adapted statement at 4.

24/ Project Nos. 2386, 2387, 2388, 7758, and 10806.

25/ Both Holyoke Power and HG&E have excellent records of compliance with their respective licenses, and periodic project inspections by staff of the Commission's New York Regional office to verify dam safety and public safety indicate that neither applicant has experienced significant dam safety or public safety problems at its licensed projects.

26/ See Holyoke Power's better-adapted statement at 3-6.

27/ See Municipalities' better-adapted statement at 14.

It appears that there are no differences between the competing applicants' need for the power from the project. It also appears that the gain or loss of power from the project would not adversely affect the capability of either applicant to continue meeting the needs of its customers. Under either proposal, the public interest will continue to be served by the availability of renewable hydroelectric resources that do not contribute to the world's greenhouse gases, and which can displace nonrenewable fossil-fueled generation capacity.

C. Section 15(a)(2)(E): Existing and Planned Transmission Services

Holyoke Power proposes no changes or additions to the existing transmission facilities. If the license is awarded to Municipalities, the project would be disconnected from Holyoke Power and connected to HG&E's distribution system. This would entail additional costs of transmission and transformer equipment for both entities, and some of the new facilities would be redundant. The transmission facilities that Municipalities propose to interconnect with the project may not provide service as reliable, for lack of "back up" ties to Holyoke Power's existing facilities.²⁸

D. Section 15(a)(2)(F): Cost Effectiveness of Plans

Under the policy established in Mead Corp.,²⁹ we make no attempt to estimate possible future energy prices over the term of a license. The basic purpose is rather to provide a general estimate of the potential power benefits and the costs of a project. We thus do not deny the issuance of a license on the basis of our own economic analysis of the economic prospects of a long-term project, but leave it to the licensee to decide whether to proceed with licensed construction and other measures on the basis of its own economic analyses. In a relicensing proceeding where there are competing applications, however, we must consider the cost-effectiveness of each applicant's plans.

Our evaluation of the economics of the two proposals shows that both appear to cost more than currently-available alternative power. As discussed below,³⁰ Holyoke Power's proposal, with measures recommended by Commission staff, would produce about 198,300 MWh annually, at a cost of \$8,752,000. The net annual benefit would be -\$954,000. Municipalities' proposal,

28/ Holyoke Power's better-adapted statement at 10-11.

29/ 72 FERC ¶ 61,027 (1995).

30/ See Comprehensive Development section of the order.

with measures recommended by Commission staff, would produce about 244,000 MWh annually, at a cost of \$11,696,000. The net annual benefit would be -\$2,815,000.³¹ Based on current economic conditions, the net annual economic benefit of Holyoke Power's proposal is almost 200 percent greater than that of Municipalities' (i.e., it is less negative).³² Clearly, Holyoke Power's proposal is significantly more cost-effective than Municipalities' proposal.³³

E. Section 15(a)(2)(G): Other Factors

Municipalities argue that their proposal with respect to recreation enhancements is significantly better than Holyoke Power's.³⁴ Municipalities propose acquiring properties along the Connecticut River, to be developed for recreational uses, or protected for environmental and aesthetic purposes, a proposal somewhat more extensive than Holyoke Power's. The proposal involves, for the most part, purchasing properties or acquiring easements in properties already owned by Holyoke Power.

Holyoke Power, on the other hand, proposes working with the City of Holyoke in the development of the proposed Canal Walk and is willing to grant easements on some of its properties adjacent

^{31/} See Final EIS, Table 5-6. As explained in the Final EIS, at p. 5-23, n. 183, we use similar criteria in comparing the two proposals.

^{32/} Indeed, as Holyoke Power points out, it periodically evaluates the feasibility of increasing capacity or generation at its hydroelectric facilities, and its most recent evaluation of this project indicated it is not economically feasible to increase capacity under the incremental cost test, because the levelized cost of expanded capacity would be higher than the levelized cost of alternative energy to any utility in the region that could be served by the new capacity. Our analysis of the economic feasibility of Municipalities' proposed expansion reaches the same conclusion. Using the figures in Table 5-6 of the Final EIS, the expansion proposal would increase generation by about 45,700 MWh annually at an annual cost of \$2,944,000. This would result in a net annual economic benefit of -\$1,861,000 for the expansion. Moreover, the expansion would have some minor unmitigable adverse effects on the Connecticut River's anadromous fish resources and fish restoration programs.

^{33/} In evaluating competing proposals for original license for an unconstructed project, we have said that a difference of 20 percent or more is significant. See City of Augusta, Kentucky, 72 FERC ¶ 61,114 at pp. 61,599-600, n. 58.

^{34/} Municipalities also seek to revitalize the economy of the City of Holyoke, and especially its Canal District, to reduce the rates of its electric customers, and provide additional recreation and environmental measures along the Connecticut River. The major commitment of resources to these endeavors would be from surplus revenues from the project, and would be dependent on the level, if any, of such surplus revenues.

to the canals for this purpose. Furthermore, Holyoke Power states its intention to explore the potential recreational use of its undeveloped riverfront property below the dam in South Hadley, and to grant conservation restrictions and provide public access to other riverfront properties it owns along the project impoundment.³⁵ However, Holyoke Power does not propose that we condition its license to require it to provide these specific recreational resources.

Both proposals are somewhat speculative. Holyoke Power's proposal is to only consider providing more extensive recreation amenities. Municipalities' proposal would provide such amenities, but only if there are surplus project revenues in the future. We therefore conclude that any differences between the proposals as they relate to recreation enhancements at the project are insignificant.

F. Conclusion

We have compared the applicants' proposals as they relate to the above factors and find that Holyoke Power's proposal is significantly more cost-effective than Municipalities' proposal. In other respects, the proposals are not significantly different. We therefore conclude that the license for the continued operation of the project should be granted to Holyoke Power.³⁶

THE PROJECT NO. 2004 APPLICATION (HOLYOKE POWER)

WATER QUALITY CERTIFICATION

Under Section 401(a) of the Clean Water Act (CWA),³⁷ the Commission may not issue a license for a hydroelectric project unless the state water quality certifying agency has either issued water quality certification for the project or has waived

^{35/} See Holyoke Power's better-adapted statement at 13-14, and 17.

^{36/} Had we simply found no significant differences between the proposals, we would next have examined Holyoke Power's compliance record with respect to the Holyoke Project, and its actions affecting the public. See FPA Section 15(a)(3), 16 U.S.C. § 808(a)(3); and 18 C.F.R. § 16.13(b) (1999). As noted previously, Holyoke Power has an excellent record of compliance with the conditions of its license for the almost 50 years that it has held the license. Moreover, Holyoke Power has spent over \$16 million on fish passage facilities at this project, and, in 1954 and 1955, constructed an innovative and highly successful fishlift. The company was awarded a Conservation Service Award in 1956 from Interior in recognition of its willingness to cooperate with conservation agencies, and for its accomplishments in the field of conservation and rehabilitation of natural resources.

^{37/} 33 U.S.C. § 1341(a)(1).

certification by failing to act on a request for certification within a reasonable period of time, not to exceed one year. Section 401(d) of the CWA provides that state certification shall become a condition on any license that is issued.³⁸

Holyoke Power and Municipalities each requested water quality certification from Massachusetts DEP. The DEP issued one certification on July 28, 1999, with conditions applicable to the license proposals of both applicants. The certification is attached to this order as Appendix A, and the conditions applicable to Holyoke Power's proposal are conditions to the license issued in this order.

Massachusetts DEP's water quality certification imposed 37 conditions on the license for this project, although seven of those conditions are applicable only to Municipalities' proposal for construction of a third turbine and generator, and are thus moot in view of our award of the license to Holyoke Power.

Condition Nos. 1-3 require that the project be operated in compliance with provisions of the Massachusetts Surface Water Quality Standards, the Massachusetts Wetlands Protection Act, and Massachusetts General Laws Chapter 91. Condition No. 4 requires that all maintenance and repair activities be conducted in a manner that will not impair water quality.

Condition No. 5 provides that any change to the project that would have a significant or material effect on the conditions of the certification must be submitted to Massachusetts DEP for prior review and approval. Condition No. 6 provides that Massachusetts DEP may request the Commission to reopen the license to make any modifications necessary to maintain compliance with applicable state law. Condition No. 7 reserves to Massachusetts DEP the right to add or alter the terms and conditions of the certification when authorized by law. Condition No. 8 requires that the certification be posted at the project powerhouse.

Condition No. 9 requires instantaneous run-of-river operation, and stabilization of the impoundment elevation to within 0.2 feet of normal pond elevation. Condition No. 12 requires a continuous minimum flow of 840 cfs in the bypassed reach from July 15 through September 15, and between November 15 and April 1. Condition No. 13 provides for minimum flows of

^{38/} 33 U.S.C. § 1341(d). Pursuant to *American Rivers v FERC*, 129 F.3d 99 (2d Cir. 1997), the Commission must accept as license conditions all conditions attached to a valid water quality certification. In any event, nothing in the conditions of a water quality certification shall be viewed as restricting the Commission's ability or the licensee's obligation, under Part I of the FPA, to take timely action to protect human life or the environment.

1,300 cfs from April 1 through July 15 and September 15 through November 15, as zone-of-passage flows for salmon and shad.

Condition No. 16 requires the licensee to distribute the flows of the project during the Atlantic salmon downstream migratory period (April 1-July 15) first to provide sufficient flows to operate fish passage facilities, second to provide 1,300 cfs in the bypassed reach for zone of passage flows, third to provide minimum flows of 810 cfs through the canal system, fourth to provide 4,200 cfs to operate Unit No. 1 at the Hadley Falls Station, fifth to provide flows into the canal at full capacity, and sixth to provide full capacity flows through the Hadley Falls Station. Condition No. 18 requires an interim regime of flows in the canal system of 810 cfs from April 1 through November 15 and 400 cfs from November 16 through March 31.

Condition No. 27 requires the licensee to continue operating the Boatlock Station downstream bypass facility until otherwise ordered by the Massachusetts DEP.

In addition to the above, the certification requires the licensee to submit, for Massachusetts DEP's approval, the following:

- X a plan for operating and monitoring the run-of-river operation (Condition No. 10);
- X a plan for replacing the wooden flashboards along the dam crest with an inflatable rubber fabric dam (Condition No. 11);
- X a plan to redistribute flows in the bypassed reach into three channels, with minimum flows of 600 cfs to the East Channel, 100 cfs to the Center Channel, and 140 cfs to the West Channel (Condition No. 14);
- X a plan for gauging flows in the bypassed reach (Condition No. 15);
- X a plan for allocating available low flows outside of fish passage season (Condition No. 17);
- X a plan to provide permanent continuous flows (Condition No. 19);
- X a plan for protecting aquatic resources during canal drawdowns (Condition No. 20);
- X a five-year plan for monitoring mussel populations in the canals, and proposals for changes in canal operations, or

- structures, if any, to protect those populations (Condition No. 21);
- X a plan to implement improvements to existing fishlift facilities, including widening the existing exit flume, increasing the capacity of the spillway and tailrace lift hoppers, widening the gated spillway entrance and channel, and providing fishway entrance attraction flows at the spillway entrance and at each of the tailrace collection gallery entrances. The fishlift facilities are to be operated whenever feasible beginning on or about March 15 for white sucker passage, from April 1 through July 15 for herring, shad, and salmon, as well as white sucker passage, and from September 15 through November 15 for fall salmon passage. Hours of operation are to be determined by the resource agencies (Condition No. 22);
- X designs for a second salmon trapping device in the fishway exit flume, a new entrance to the tailrace fishlift, and ledge excavation on the west wall of tailrace downstream of the existing tailrace fishlift entrance; and
- proposals for operating the fish passage facilities (including counting, trapping, monitoring and collection of biological data) under the licensee-paid supervision of Massachusetts DFW; and for monitoring the use of the upstream fish passage facilities by resident fish and submitting proposals for any changes necessary to protect and enhance such passage (Condition No. 23);
- X designs for a new fish-trapping and hauling system, and a study of the effectiveness thereof; for a conveyance that will intercept downstream-migrating anadromous fish at the Bascule gate and transport them to the Hadley Falls Station tailrace; for a barrier to migrating fish across the Number 2 overflow raceway in the canal system; for American eel ladders on both the spillway and tailrace sides of the dam; and for a study of the effectiveness of the barrier and ladders (Condition No. 24);
- X a plan for downstream passage of American eels, and a study of the effectiveness of measures taken (Condition No. 25);
- X a plan to meet the upstream and downstream passage needs of shortnose sturgeon, and a study of the effectiveness of measures taken (Condition No. 26);
- X a riparian management plan, including all property owned by Holyoke Power within 200 feet of the Connecticut River around and above the Holyoke Dam (Condition No. 28);

- X plans to monitor and fight invasive species (including zebra mussel and water chestnut) within the project boundary, and to protect, enhance and manage animals and plants listed as protected under the Massachusetts Endangered Species Act (Condition No. 29); and
- X a water quality monitoring plan (Condition No. 30).

Any Massachusetts DEP-approved proposed modifications to the license, including project-related construction, operation, and maintenance, must be the subject of a licensee application to the Commission to amend the license.

In our judgment, a number of the certification conditions, which do not reflect a balancing of developmental and environmental considerations, entail measures that are very costly in light of their benefits or current need. In this category we include the bypass and zone-of-passage flows (Condition Nos. 12 and 13); the redistribution of project flows during the downstream migratory season (Condition No. 16); the extensive expansion of the upstream fish passage facilities, and the hours of fishlift operation (Condition Nos. 22 and 23); and a third entrance to the Hadley Falls tailrace fishlift, as well as licensee funding of the state's oversight thereof (Condition No. 23).

SECTION 18 FISHWAY PRESCRIPTIONS

Under Section 18 of the FPA,³⁹ the Commission must require a licensee to construct, operate, and maintain such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce. Prescriptions were filed by FWS, on behalf of the Secretary of the Interior, on June 11, 1999, and by NMFS, on behalf of the Secretary of Commerce, on June 7, 1999. These prescriptions are set forth in license Articles 411, 412, and 413. Most of these prescriptions are also contained in the mandatory conditions to the above-referenced water quality certification issued for this project pursuant to Section 401 of the CWA,⁴⁰ such that no further analysis is required here.

We next address the prescriptions submitted under FPA Section 18 that are not contained in the mandatory certification conditions. Although we do not consider them to be within the scope of Section 18 of the FPA, we are adopting the following under our general conditioning authority in Section 10(a)(1) of

^{39/} 16 U.S.C. § 811.

^{40/} As noted above (n. 51), we must accept all certification conditions, even if they include fishway prescriptions that we believe fall beyond the scope of FPA Section 18.

the FPA. Of FWS' Section 18 filing: Paragraphs 9.1.D (requiring a timetable for fishway construction and initial operation), 9.1.G (requiring proper fishway maintenance and a maintenance plan), 9.1.H (requiring fishway effectiveness studies of prescribed facilities), 9.1.I (FWS access to the project site and project records), and 9.2.2.4 and 9.3.3.5 (licensee evaluation of effectiveness of downstream fishways). Of NMFS' Section 18 filing: paragraphs 9.1.E (requiring a timetable for fishway construction and initial operation), 9.1.G (requiring proper fishway maintenance and a maintenance plan), 9.1.H (requiring fishway effectiveness studies of prescribed facilities), 9.1.J (prior consultation with NMFS on all plans, schedules, models and studies), 9.1.I (NMFS access to project site and project records), and 9.3.4.d) (licensee evaluation of effectiveness of downstream fishways).

In paragraph 9.1.E of FWS' prescriptions and in the comparably-worded paragraph 9.1.F of NMFS' prescriptions, we will adopt the requirement that the licensee notify FWS and NMFS of any request it makes to us for an extension of time to comply with the provisions of the fishway prescriptions adopted herein, but we will not require the licensee to obtain the approval of FWS or NMFS for such an extension. Extensions of time are not fishways, and therefore fall beyond the scope of Section 18. The Commission, as the agency having statutory responsibility for license compliance, needs to maintain control over its compliance processes, including the timing thereof.⁴¹

We will adopt the requirements of paragraph 9.1.J of FWS' prescriptions (plans, schedules, models and studies) to the extent it requires prior consultation with FWS, but not to the extent it requires prior approval of FWS.⁴² Again, the Commission has the statutory responsibility for compliance with the articles of the license, including the fishway prescriptions incorporated therein, and the prior approval requirement falls beyond the scope of Section 18.

We will adopt the requirements of paragraphs 9.2.2.2 and 9.3.3.2 of FWS' prescriptions and paragraph 9.3.5.b of NMFS' prescriptions (angled bar rack in the project's forebay), except for FWS' imposition of any restrictions on the generation of power from the project. The generation of power (and restrictions thereon) is not a fishway, and falls beyond the scope of Section 18.

^{41/} See, e.g., Central Maine Power Co., 82 FERC ¶ 61,190 at pp. 61,732-33 (1998); Bangor Hydro-Electric Co., 83 FERC ¶ 61,038 at p. 61,108 n. 12 (1998).

^{42/} Compare paragraph 9.1.I of Commerce's prescriptions, referred to above, which requires prior consultation with NMFS but not prior approval.

In their respective Section 18 prescriptions, FWS and NMFS each requested that we reserve our authority to require such fishways as Interior or Commerce may prescribe in the future. Accordingly, license Article 415 does so.⁴³

ESSENTIAL FISH HABITAT

Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act⁴⁴ requires federal agencies to consult with the Secretary of Commerce regarding any action or proposed action authorized, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH) identified under the Act. Under Section 305(b)(4)(B) of the Act,⁴⁵ an agency must, within 30 days after receiving recommended measures from NMFS or a Regional Fishery Management Council, describe the measures proposed by the agency for avoiding, mitigating, or offsetting the effects of the agency's activity on EFH.⁴⁶

On December 19, 1997, NMFS published an interim final rule in the Federal Register that outlined procedures for implementing the EFH provisions of the Magnuson-Stevens Act.⁴⁷ The interim final rule strongly encourages incorporation of EFH consultation into existing consultative processes (e.g., NEPA) as a mechanism for satisfying EFH consultation requirements. The Commission has consulted with NMFS and provided NMFS with proposed procedures for incorporating EFH consultation into our existing consultative processes. The Commission's proposed procedures are still under review by NMFS.

According to the Commission's proposed procedures, a project for which a notice has been issued indicating the project is ready for environmental review prior to Secretarial approval of a Fishery Management Plan (FMP) or, as is the case here,⁴⁸ a FMP

^{43/} The Commission's reservation of the agencies' Section 18 authority solely on the basis of their request has been affirmed. See *Wisconsin Public Service Corp. v. FERC*, 32 F.3d 1165 (7th Cir. 1994).

^{44/} 16 U.S.C. § 1855(b)(2).

^{45/} 16 U.S.C. § 1855(b)(4)(A).

^{46/} The measures recommended by NMFS are advisory, not prescriptive. However, if the federal agency does not agree with the recommendations of the Secretary of Commerce, the agency must explain its reasons for not following the recommendations.

^{47/} Fed. Reg Vol. 62, No. 244.

^{48/} Pursuant to Section 303(a)(7) of the Magnuson-Stevens Act (16 U.S.C. § 1853(a)(7)), the Secretary of Commerce approved Amendment 1 to the Atlantic Salmon Fishery Management

amendment that identifies EFH, would not be retroactively subject to EFH consultation. However, by letter filed June 7, 1999, NMFS requested EFH consultation regarding the Holyoke Project operation's effect on Atlantic salmon in the Connecticut River. By letter dated July 2, 1999, the Commission requested that NMFS provide its final EFH recommendations for Atlantic salmon habitat at the Holyoke Project.

On August 2, 1999, the Department of Commerce, on behalf of NMFS, filed its response, stating that issuance of a new license for the Holyoke Project, as described in the Draft EIS with either the staff-recommended alternative or the applicants' proposed actions, would degrade and adversely affect habitat designated as essential fish habitat for Atlantic salmon. Consequently, Commerce filed four EFH recommendations for Atlantic salmon in the Connecticut River.

Contrary to Commerce's assertion, we assess that the action described herein would not adversely affect EFH designated for Atlantic salmon in the Connecticut River.⁴⁹ Rather, EFH for Atlantic salmon would be enhanced by run-of-river operation, the increase in minimum flows to the bypassed reach, and improved fish passage measures, as described in the Final EIS (see sections 4.1.1.3., 4.1.2.3., 4.2.1.3., 4.2.2.3., 5.4.2., and 5.4.3.).

In EFH Recommendation A, Commerce recommends that the licensee design, construct, operate, monitor and maintain such fish passage facilities as may be required to provide safe and efficient upstream and downstream passage of Atlantic salmon at the Holyoke Project. Also, in EFH Recommendation B, it appears that Commerce is recommending that certain fish passage facilities be installed and operational in a timely manner,⁵⁰ as

Plan, designating EFH for Atlantic salmon, on March 3, 1999. The ready-for-environmental-assessment notice for the Holyoke Project was issued on November 3, 1998.

49/ We define baseline as existing conditions, rather than pre-project conditions. Using this definition, essential fish habitat for Atlantic salmon would be enhanced under any alternative outlined in the Final EIS, except the no-action alternative.

50/ The facilities include: (1) improvements to the fishlift system for operation up to 40,000 cfs; (2) expansion of the fishlift system, including exit channel, to accommodate passage of the design populations of anadromous fish; (3) the downstream migrant structure at the Bascule gate; and (4) the angled bar rack at the Hadley Falls station.

well as that certain of the new fish passage facilities proposed by Municipalities be installed and operational by 2006.⁵¹

While we would not propose the extensive expansion of the fishlift system or the angled bar rack at this time, the measures described in Commerce's EFH Recommendations A and B are a part of this license, by dint of their inclusion in the fishway prescriptiona filed pursuant to Section 18 of the FPA.

Commerce, in its EFH Recommendation C, recommends that the licensee provide a continuous minimum zone-of-passage flow of 1,300 cfs in the river reach below the spillway from April 1 through November 15. This recommendation includes the mid-July to mid-September period when upstream passage requirements for adult Atlantic salmon would be minimal or non-existent.⁵²

Adult Atlantic salmon exhibit a well-defined, seasonal (late May to early July) period of abundance at the Holyoke Project during upstream spawning migrations. Between 1993 and 1997, 95 to 100 percent of all spring/early summer migrants were collected by June 30 each year.⁵³ In colder than normal, high-flow springs, single individuals have been collected as late as July 15, and a small percentage of the run has occurred in September/October with decreasing water temperatures and increasing flow. Seasonally high water temperatures occur in the Connecticut River during mid-summer, which, coupled with seasonally low flows, are not energetically or physically supportive of upstream migration.

Further, as outlined in its conditions filed pursuant to Section 18 of the FPA, NMFS did not require operation of the Holyoke fishlifts between July 15 and September 15 for upstream migrating Atlantic salmon. Hence, the basis for Commerce's EFH recommendation for a zone-of-passage flow of 1,300 cfs between July 15 and September 15 is unclear. Given the aforementioned information, we find that there is no biological basis or evidence supporting a recommendation for zone-of-passage flows of

51/ Since we are awarding the new license for the Holyoke Project to Holyoke Power, the EFH recommendations specific to Municipalities, proposed project are moot.

52/ We also assume this recommendation applies to the downstream migration season for adult and juvenile Atlantic salmon. As outlined in FWS' and NMFS' fishway prescriptions, the designated downstream migratory period for juvenile salmon is from April 1 to June 15, while post-spawn adult salmon generally move downstream in the late fall and winter.

53/ See Municipalities' additional information response filed on December 23, 1998.

1,300 cfs from mid-July to mid-September for adult Atlantic salmon.

The staff's analysis and recommendations did not reject or contradict the agencies' recommendations for higher bypass flows for downstream migration (i.e., up to 1,300 cfs).⁵⁴ Rather, the staff concluded that any bypass reach flow recommendation, including the 1,300 cfs proffered by NMFS, should be evaluated for its influence on passage effectiveness. Monitoring of recommended flows would lead to improved decisions regarding flows needed to ensure safe and adequate passage of anadromous fish through the bypassed reach.

Finally, Commerce's EFH Recommendation D includes a provision that the licensee provide interpretive information at the Robert E. Barrett Fishway⁵⁵ about the essential fish habitat designation and its importance to restoring Atlantic salmon in the Connecticut River Basin. We agree, and will make such measure a requirement of the project recreation plan required by Article 418.

RECOMMENDATIONS OF FEDERAL AND STATE FISH AND WILDLIFE AGENCIES

Section 10(j) of the FPA⁵⁶ requires the Commission, when issuing a license, to include license conditions, based on recommendations of federal and state fish and wildlife agencies submitted pursuant to the Fish and Wildlife Coordination Act, to "adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including related spawning grounds and habitat)" affected by the project.

If the Commission believes that any such recommendation may be inconsistent with the purposes and requirements of Part I of the FPA or other applicable law, Section 10(j)(2) requires the Commission and the agencies to attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agencies. If the Commission then does not adopt a recommendation, it must explain how the recommendation is inconsistent with applicable law, and how the conditions selected by the Commission adequately

^{54/} In the Final EIS, the staff outlines the rationale for its recommendation for interim zone-of-passage flows of 800 cfs during the spring and 420 cfs during the fall (see sections 4.1.1.3., 4.2.1.3., 5.4.2., 5.4.3., and staff response to Comment No. 16 in Appendix C).

^{55/} The Fishway is open to the public in May and June to observe fish migration.

^{56/} 16 U.S.C. § 803(j).

and equitably protect, mitigate damages to, and enhance fish and wildlife.

Interior, FWS, NMFS, and Massachusetts DFW filed recommendations pursuant to Section 10(j).⁵⁷ In the Draft EIS, Commission staff concluded that eleven of the agency recommendations did not fall within the scope of Section 10(j), because they were not specific measures for the protection, mitigation of damages to, or enhancement of fish and wildlife resources. These included recommendations for: (1) a plan for sharing costs and/or responsibilities for fish passage operations, (2) a plan for short-nosed sturgeon passage, (3) plans for downstream passage of American eel and shortnose sturgeon, (4) the evaluation of the use of Boatlock bypass and louver facilities, (5) service on the resource agencies of requests for license amendments and requests for extension of time, (6) development and implementation of a cultural resources management plan, (7) creation of an environmental and recreation trust fund, (8) funding for a channel marking program, (9) installing a flow fluctuation warning system, (10) implementing unspecified entrainment measures to protect shortnose sturgeon, and (11) implementing unspecified downstream passage measures for the American eel.

Because staff concluded that these recommendations did not fall within the scope of Section 10(j), staff instead considered them under FPA Section 10(a), and recommended accepting seven of the eleven recommendations: (1) upstream passage plan for the shortnose sturgeon; (2) downstream passage plans for the shortnose sturgeon and American eel; (3) a cultural resources management plan; (4) a channel marking program; (5) a flow fluctuation warning system; (6) an effectiveness study of the louvered guidance device and bypass facility, and (7) serving pleadings on the resource agencies.⁵⁸

Of the recommendations within the scope of Section 10(j), Commission staff concluded that all or part of 18 appeared to be inconsistent with Part I of the FPA: (1) minimum instream flow of 840 cfs to the bypassed reach, (2) seasonal zone-of-passage flow of 1,300 cfs to the bypassed reach, (3) a plan for channel modifications, (4) the release of 840 cfs, in specified increments, in the South Hadley, Middle, and Holyoke channels, (5) a third entrance at the tailrace fishlift, (6) a new salmon-trapping facility, (7) redistribution of flows through the

^{57/} These recommendations were generally applicable to both Holyoke Power's and Municipalities' proposed projects, although the agencies made some recommendations that apply only to Municipalities' proposal, because it involves proposed new construction, while Holyoke Power's proposal does not.

^{58/}

project during spring passage season, (8) monitoring of resident upstream fish passage, (9) operation of upstream fishlifts from April 1-November 15, (10) gaging of streamflows in the three bypass channels, (11) permanent minimum flows in the canals, (12) monitoring of mussels in the canals, (13) improvement and expansion of the existing fishlifts, (14) new spillway fishlift, (15) upstream passage for the American eel, (16) protection of Log Pond Cove, Bachelor Brook, and Cove Island, (17) implementation of Scheme A with 840 cfs spillway flows, and (18) provision of recommended interim passage measures, if Unit 3 construction is deferred.⁵⁹

As detailed in the Draft EIS, staff concluded that these would not provide environmental benefits commensurate with their costs, and that the alternative measures staff recommended would adequately satisfy the needs of fishery resources without placing an undue economic burden on the licensee.⁶⁰ Staff recommended, among other things, a run-of-river project operating mode; minimum flows of 800 cfs in the bypassed reach from April 1 through July 15, and 420 cfs from August 1 through March 31; the development of upstream and downstream fish passage plans; an American eel passage and protection plan; a fish and aquatic habitat monitoring plan for the bypassed reach; a water quality monitoring plan; a plan for monitoring project operations; and a canal operating plan, including minimum flows of 810 cfs from April 1 through November 15, and 400 cfs from November 16 through March 31.

59/ Items 14, 17, and 18 were applicable only to the Municipalities' proposal to expand the project's capacity, and are thus moot in view of our award of the license to Holyoke Power.

60/ Zone of Passage flows and minimum flows in the project bypassed reach, and reasons for rejecting recommended flows of FWS and other agencies, pp. 4-148 through 4-157 and 4-204 through 4-206, and pp. 5-64 through 5-66 of the Draft EIS. Reasons for not immediately requiring modifications of various channels in the bypassed reach, p. 5-65. See pp. 4-23 and 4-24, 4-85, 4-151, 4-156 and 4-157 for additional staff analysis of the proposed channel modifications. Recommendations for improving the existing upstream fishlift facilities, pp. 5-66 and 5-67. Analysis in support of those recommendations, pp. 4-42 through 4-53 and 4-109 through 4-113, 4-166 through 4-171, and 4-216 through 4-219. Discussion of FWS' gaging recommendations, and reasons for staff's recommendations, pp. 4-138, 4-139, and 4-196. FWS' recommendation for requiring monitoring of mussel populations, pp. 4-158 and 4-159, and 4-206. Recommendations for a new salmon trapping facility at existing fish trap/counting station, pp. 4-110 and 4-169. Recommendation of only one eel ladder, pp. 4-55 through 4-57, 4-115, 4-116, 4-173, 4-221, pp. 5-68, and 5-69. Modifying and expanding the capacity of the existing tailrace and fishlift passage facility pp. 4-49 through 4-52, and 4-108 through 4-112, pp. 4-166 through 4-170 and 4-216 through 4-218.

On April 19, 1999, following publication of the Draft EIS, staff sent letters to the resource agencies, summarizing its preliminary determinations regarding their recommendations. With respect to the recommendations that staff concluded were inconsistent with Part I of the FPA, staff asked the agencies whether they could accept staff's alternate recommendations, had any other recommendations to proffer, and wanted to provide additional support for their recommendations.

Commission staff scheduled a meeting for May 26, 1999, in Holyoke, to meet with representatives of the state and federal fish and wildlife agencies in order to discuss staff's preliminary determinations and pursue resolution of the apparent inconsistencies between the agencies' recommendations and the requirements of Part I of the FPA. The fish and wildlife agencies did not attend the meeting. Instead, they filed letters asserting that, because staff had not supplied them with detailed information they had requested, they were unprepared to discuss Section 10(j) issues.

A. Recommendations Outside the Scope of Section 10(j)

In their comments on the Draft EIS, the agencies do not argue that the recommendations staff found to be outside of Section 10(j) do in fact fall within the scope of that section. Rather, as noted above, they contend generally that staff has not provided them enough information with respect to its Section 10(j) determinations for them to respond.

We agree with staff's determination regarding the recommendations that staff concluded are outside the scope of Section 10(j). Section 10(j) recommendations are to be specific measures, not general recommendations that there should be beneficial measures on behalf of fish and wildlife.⁶¹ The recommendations in question here call for general plans (e.g., the four recommendations calling for upstream and downstream fish passage plans, the evaluation of bypass and louver facilities,⁶² and the unspecified entrainment measures), or are not fish and wildlife measures at all (e.g., the channel-marking program, the cultural resource management plan, the flow fluctuation warning system, and the service of documents on the resource agencies).

61/ See, e.g. Southern California Edison Co., 77 FERC ¶ 61,313 at p. 62,430 (1997).

62/ This recommendation also runs afoul of our Section 10(j) regulations, which state that such recommendations do not include studies that could have been performed pre-licensing. 18 C.F.R. § 4.30(b)(9)(ii). See Upper Peninsula Power Co., 83 FERC ¶ 61,366 at pp. 61,366-67 (1998).

And we have previously held that recommendations for trust funds are not Section 10(j) recommendations.⁶³

As to the agencies' contention that they lacked enough information to provide substantive comments on these matters, the fact that staff did not specify in detail in the Draft EIS why it preliminarily determined that particular conditions were outside of Section 10(j) did not preclude the agencies from explaining why they believe that the contrary is true. The Commission's rulings on the scope of Section 10(j) are numerous and public, and one or both federal agencies have participated in over 200 hydroelectric licensing proceedings since the 1986 enactment of Section 10(j).⁶⁴ Moreover, the agencies' decision not to attend the May 26, 1999 meeting precluded their opportunity to obtain any necessary clarification of staff's position. Finally, as to the seven recommendations that staff proposed be accepted under Section 10(a), our adoption of these recommendations in the license renders irrelevant the question of under which section of the FPA they were considered.

B. Recommendations Within the Scope of Section 10(j)

The Commission received substantive comments regarding staff's recommendations on Section 10(j) issues from only Interior and Massachusetts DFW.⁶⁵ We discuss these comments below.⁶⁶

1. Minimum flows

Massachusetts DFW argues that the record shows that staff relied on incorrect information that showed that current spring flows in the bypassed reach are 350 cfs. According to

^{63/} See, e.g., *City of Augusta, Kentucky*, 72 FERC ¶ 61,114 at p. 61,601 (1995).

^{64/} Section 10(j) was added by the Electric Consumers Protection Act, P.L. 99-495 (October 16, 1986).

^{65/} FWS' comments on the Draft EIS consist solely of its fishway prescription; it does not discuss staff's determinations with regard to its recommendations. Similarly, NMFS, which also filed a fishway prescription, addresses its Section 10(j) recommendations only to the extent of arguing generally that the Draft EIS is not supported by substantial evidence.

^{66/} The June 7, 1999 comments of Interior, NMFS, and Massachusetts DFW clarified their original Section 10(j) recommendations on monitoring flows in the bypassed reach, which resolved the apparent conflict. The Final EIS (at p. 5-42, n. 189) adopted the agencies' recommendations on this issue, as do we. Also, Interior's and Massachusetts DFW's clarifications of their comments on the staff's recommended regime for monitoring mussels in the canal system (Final EIS at p. 5-43 n. 190) resolve the apparent conflicts on that matter.

Massachusetts DFW, those flows are actually a minimum of 550 cfs (and more likely 830 cfs). This being the case, the 420 cfs recommended by staff will be a reduction in flow, rather than an increase, as staff assumed. Massachusetts DFW disagrees with staff's conclusion that the increase in fish habitat that would occur at an 840 cfs minimum would not be the most efficient use of flow releases.⁶⁷

The discrepancy in characterizing existing spring flows hinges on the amount of flow in the Alden weir, which is installed in the Bascule gate during the passage seasons. These flows are discussed in detail in Appendix C of the Final EIS.⁶⁸ There, the staff concurs with the resource agencies that bypass flows may at times be higher than 350 cfs, but states that it focused on 350 cfs in the Draft EIS to conservatively represent existing conditions.

We concur with the resource agencies' conclusions that the determination of the actual existing bypass flow does not alter conclusions about the biological habitat implications of various flow discharges, since the Instream Flow Incremental Methodology (IFIM)⁶⁹ results are still valid. However, the agencies' suggestion that bypass flows are on the order of 800 to 900 cfs is flawed, because they are predicated on flows through the Alden weir (600 to 750 cfs) that are not possible at normal full pond. Therefore, using 350 cfs as the existing flow condition in the bypass during the fish passage seasons is appropriate for evaluating the balancing of power and non-power uses, costs, and implications of flow discharges, and for comparing existing and recommended flows.

2. Specific flows and modifications for the bypassed channels

Massachusetts DFW contends further that staff erred in rejecting its proposal to require specific minimum flows in the three bypass channels, and to modify the channel to make this possible. The agency states that this scheme would maximize the habitat benefits of the flows, and that its channel flow proposals mimic the natural flow into the channels. It disagrees with staff's conclusions that the results of channel modification

^{67/} Interior's arguments on its Section 10(j) recommendations are also raised by Massachusetts DFW and are not separately addressed here.

^{68/} Final EIS at pp. C-12 to C-14.

^{69/} This methodology, developed by FWS, evaluates the impacts on fish and invertebrate habitat resulting from incremental modifications in streamflow.

are uncertain, and that the procedure would require additional regulatory approval.⁷⁰

We agree that channel modifications are a reasonable and prudent measure that may be used to more effectively achieve various fish habitat and fish passage objectives for the bypassed reach. In the Final EIS, section 4.2.1.3., the staff provides an in-depth discussion of the potential and rationale for channel modifications, and agrees with the agency recommendations for some sort of channel modifications and the potential benefit to passage and resident fish habitat.

However, we also believe the record is incomplete for recommending specific and immediate channel modifications, and that the most prudent approach is to establish an interim flow with the requirement for post-licensing monitoring of flows, habitat, and fish passage to obtain the needed information. There is a lack of critical information to assess certain aspects of flow distribution, fish passage routines and behavior, etc. The agencies generally concur on this point, and agree that implementation of the channel modifications would need to proceed in a step-wise manner and be responsive to the results of flow and fish monitoring studies.

We believe that the need for, and design of, channel modifications or alternative flows should emerge from further monitoring and assessment whereby resource management decisions are made as part of an ongoing science-based process. In that way, other important factors and alternative techniques and the results of monitoring fish passage success can be considered in the design of the modifications.

However, Condition No. 14 of the water quality certification requires the licensee to prepare a plan to redistribute specified flows to the three channels in the bypassed reach within one year of license issuance. Nevertheless we are including Article 410, which requires the licensee to monitor fish habitat, fish passage, and flows to determine the effectiveness of the required minimum flow regime, and the need to implement any additional enhancement measures, such as channel modifications.

3. Zone-of-passage-flows

Massachusetts DFW disagrees with staff's conclusion that a zone-of-passage flow of 800 cfs is adequate, contending that, during some periods of the year, 1,300 cfs is necessary to provide adequate salmon habitat. Similarly, Massachusetts DFW asserts that minimum flows in the canal of 810 cfs year-round (as

^{70/} In addition, Massachusetts DFW maintains that staff inappropriately applied white sucker spawning curves to assess macroinvertebrate habitat at various flows. These concerns are addressed in the Final EIS, Appendix C at pp. C-17 to C-19.

opposed to staff's recommendation for a flow of 400 cfs from November 16 through March 31) are necessary to provide quality habitat for mussels, to minimize sedimentation, and to maintain water quality.

The staff's recommendation for an interim 800-cfs zone-of-passage flow during the spring period was based on several considerations.⁷¹ First, the spring period is when most Atlantic salmon, American shad, and river herring pass upstream. Second, 800 cfs provides for the widest single area with functional passage conditions at the critical upstream passage cross-section (no. 3) in the South Hadley channel. This is consistent with the agencies' recommendations that a zone of passage is best when provided as a single contiguous area. Third, whereas flows above 800 cfs provide slightly (up to 2 percent) greater total functional passage areas along cross-section 3, the size of the contiguous functional passage areas declines as these areas become spread out and velocities increase.

The staff's analysis and recommendations did not reject or contradict the agencies' recommendations for higher bypass flows for passage (i.e., up to 1,300 cfs). Nor did they reject, out of hand, the possibility that higher flow, channel modifications, or other measures may be required to ensure fish passage in the bypassed reach. The staff concluded that the most prudent approach would be to implement an interim 800-cfs bypass flow during the spring, combined with measures to evaluate the passage effectiveness of the recommended flow. This would allow the decision to implement higher flows or other measures (e.g., channel modifications, pulsed flows) to be based on monitoring of passage effectiveness and the result of other pending studies (e.g., shortnose sturgeon studies). This approach, which we adopt, avoids the implementation of overly conservative measures, and will improve decisions on the final flows and measures needed to ensure safe and adequate passage of anadromous fish through the bypassed reach.

Regarding the recommended fall passage flows, the staff recommended a lower zone-of-passage flow, because at this time there is less justification for a higher fall flow. The fall passage period supports far fewer upstream migrants (a small number of Atlantic salmon), and the staff's recommendation provides for a minor improvement in passage conditions, commensurate with the fish runs.⁷² However, a resource management approach where decisions are made as part of an ongoing science-based process could also be implemented for the

71/ See Final EIS, pp. 4-16 to 4-30 and 4-152 to 4-161.

72/ We recognize that our conclusions and provisions for fall fish passage flows could change as the result of our consultation with NMFS for the shortnose sturgeon.

issue of fall passage flows; accordingly, we agree with staff's recommendations that the licensee be required to perform flow and fish passage monitoring in the spring and fall migratory periods. Should the number of upstream migrants increase substantially in the future, or should monitoring studies indicate that the 420-cfs passage flow results in inadequate passage conditions, then additional measures (e.g., higher zone-of-passage flows, pulsed flows, channel modifications) may be necessary to provide adequate passage conditions.

However, Condition Nos. 12 and 13 of the water quality certification require the immediate release of 840 cfs in the bypassed reach from July 15-September 15 and November 15-April 1, and minimum flows of 1,300 cfs from April 1 through July 15 and September 15 through November 15.

We are not adopting Massachusetts DFW's recommendation that minimum flows of 810 cfs should be maintained year-round in the canal system. Given the stated priorities, the staff's recommended flow of 810 cfs, when available, would improve conditions in the canal system during the productive growing season between April and November. The needs of aquatic organisms to maintain their life functions are very much reduced during the cold, winter months, when their metabolism is much slower, and growth nearly ceases. Also, maintaining water quality standards during the winter months would likely not be an issue. Dissolved oxygen is generally much higher with colder water. Hence, we do not see the need to increase flows above 400 cfs from November 16 through March 31.

Nevertheless, our required measures to monitor and re-evaluate flow needs at the project will allow for some reprioritization of flows, if the existing regime does not provide adequate protection and enhancement of the mussels in the canal system.

4. Fish hopper capacity

Massachusetts DFW disagrees with the staff's conclusion that increased fishlift hopper capacity is not warranted because mortality in the fishlift exit channel does not exceed two percent, even though acknowledging that the maximum design capacities are routinely exceeded during the peak of the upstream migration. Massachusetts DFW argues that a complete physiological analysis of the fish released from the facility when overcrowded is necessary to make this determination.

In section 4.1.1.3. of the Final EIS, the staff recognized that the fishlift system's capacity at Holyoke is exceeded, and that a minimal level of mortality occurs. Over-crowding was cited as one factor causing the mortality, however, water temperature appeared to be more significant than over-crowding in leading to mortality of shad in the fishlifts. Assuming water

temperature is the primary factor leading to shad mortality, an expansion of the hopper capacities would not necessarily reduce shad mortality. The frequency at which the fishlifts are operated would seem to be of more importance than the hopper capacities.

A complete physiological analysis under appropriate, comparative conditions might yield useful information on the factors leading to shad mortality in the Holyoke fishlift system. However, we do not believe that such a study would alter our conclusions concerning the need for the agency-recommended hopper capacities.⁷³ Thus, we are not requiring such a study.

5. Second fish-trapping device

Massachusetts DFW also urges that a second trapping device should be part of a larger renovation of the existing fish passage facility to widen the exit flume and gated spillway entrance, and that the second trapping device be built as part of a new counting station opposite the existing station.

In the Final EIS, the staff recommends that the licensee expand the capacity of the spillway fishlift and excavate the entrance to the fishlifts as necessary to provide bottom level access. The staff also recommends installation of a second fish trap and counting area, as proposed by Holyoke Power, and a new trap and haul facility, as proposed by Municipalities, or evaluation of other trapping and hauling mechanisms. The extensive expansion recommended by Massachusetts DFW was not supported by the evidence in the record, whereas the record and staff's analysis in the Final EIS fully supports the staff's recommendations.⁷⁴ Accordingly, we would adopt staff's recommendations, except that the specifications for expanding fishlift capacity and the design of the second salmon trapping device are prescribed under Condition Nos. 22 and 23 of the water quality certification.

6. Multiple eel ladders

Massachusetts DFW disagrees with the staff's conclusion that only one eel ladder, on the South Hadley side of the dam is needed. Massachusetts DFW urges that two additional ladders be

^{73/} One to two percent mortality of shad, a species noted for its sensitivity to handling stress, is quite low. The significant expansion in the hopper capacities recommended by the resource agencies is unlikely to significantly improve this level of mortality, such that, based on an incremental analysis, we could justify the additional expense as being in the public interest.

^{74/} Final EIS at pp. 4-43 to 4-52, 4-112 to 4-116, 4-169 to 4-174, and 4-224 to 4-228.

constructed on the Holyoke side, one in the tailrace, and another in the vicinity of the spillway fishlift.

The staff evaluated the installation of multiple eel ladders at the project, but did not recommend adopting the Massachusetts DFW's recommendation for three individual eel ladders at the project.⁷⁵ The staff concluded that, while potentially providing an incremental benefit for upstream eel passage, the additional cost of such facilities did not warrant their construction at this time. However, since both FWS and NMFS prescribed multiple eel ladders under Section 18, such conditions are imposed.

We conclude that the conditions imposed in this license adequately protect, mitigate damages to, and enhance the fish and wildlife (and their habitat) affected by the project.

THREATENED AND ENDANGERED SPECIES

On April 19, 1999, the Commission staff issued letters to NMFS and FWS, concluding, on the basis of the staff's findings and analysis in the Draft EIS, that expanding, operating, and maintaining the project, with the staff's recommended measures, is not likely to adversely affect the shortnose sturgeon (in the letter to NMFS), nor the American bald eagle or Puritan tiger beetle (in the letter to FWS). The staff asked NMFS and FWS to concur in the staff's conclusion that formal consultations under Section 7 of the Endangered Species Act are not required.⁷⁶ In letters filed June 1 and June 7, 1999, NMFS advised that it did not concur in the staff's conclusion, and requested the initiation of formal consultation to assess the impact of the project's operation on endangered shortnose sturgeon and the incidental and unauthorized taking of shortnose sturgeon as a result of such operation.⁷⁷ FWS has not yet responded to staff's request for concurrence.

On June 4, 1999, the Commission staff initiated formal consultation with NMFS on the shortnose sturgeon, provided NMFS with citations to the sections of the Draft EIS that constituted the staff's biological assessment of sturgeon, and requested that NMFS submit its biological opinion by July 15, 1999. Should FWS

^{75/} Final EIS at pp. 4-54 to 4-57, 4-118 to 4-120, 4-179 to 4-181, and 4-231 to 4-233.

^{76/} 16 U.S.C. §§ 1531-43.

^{77/} Section 9 of the ESA makes it unlawful for any person to "take" any endangered species. 16 U.S.C. § 1538. The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." See ESA Section 3(19), 16 U.S.C. § 1532(19).

not concur with staff's "no adverse effect" conclusion, there may need to be formal consultation with FWS, as well.

NMFS has up to 135 days from the date formal consultations were initiated to complete the formal consultations and file its biological opinion with the Commission.⁷⁸ Because consultation with NMFS and FWS has not yet been completed, we are reserving our authority to revise the terms and conditions of this license to incorporate any measures necessary to comply with the Endangered Species Act in light of any biological opinion. Compliance with license provisions will potentially enhance, and not adversely alter, the environmental status quo, or make irreversible or irretrievable commitments of resources which could have the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures.⁷⁹

In the Final EIS, the staff recommended that the new licensee for the Holyoke Project be required to prepare and implement an endangered, threatened and sensitive species protection and enhancement plan that includes the federally listed endangered shortnose sturgeon and the threatened American bald eagle and Puritan tiger beetle. Moreover, the plan would include certain state-listed endangered, threatened, and sensitive species, including, but not limited to, the state endangered yellow lampmussel and dwarf wedgemussel.⁸⁰ We concur in that recommendation, and Article 416 requires the preparation and implementation of the plan, subject to modification upon completion of consultation with NMFS.⁸¹

The plan must include, but not be limited to, measures to enhance eagle nesting sites (i.e., by erecting eagle nest platforms), and measures to protect and enhance eagle perching and feeding activities. The new licensee should cooperate with FWS, Massachusetts DFW, and Massachusetts DEM to educate the public and police recreational activities at Rainbow Beach, for the purpose of protecting the Puritan tiger beetle on the beach. The plan must include provisions to protect and enhance shortnose sturgeon habitat in the project area and allow safe passage at the project. Measures to protect and enhance shortnose sturgeon,

78/ See 16 U.S.C. § 1536(b) and 50 C.F.R. § 402.14(e).

79/ See Section 7(d) of the ESA, 16 U.S.C. § 1536(d).

80/ Final EIS at p. 5-77.

81/ That article and Article 410 also require that the plans for monitoring the bypassed reach and for shortnosed sturgeon protection consider pulsed flows as an alternative flow measure for enhancing passage efficiency through the bypassed reach.

must at a minimum be based on the results of the ongoing shortnose sturgeon studies, and any measures developed upon completion of those studies and after consultation with NMFS. Finally, the plan must include protection and enhancement measures for the yellow lampmussel and dwarf wedgemussel, as identified in the canal operations plan.

The cost of developing a threatened and endangered species plan would be nominal. Implementation of protection and enhancement measures would require greater expenditures (*e.g.*, the construction of eagle nesting platforms is estimated at \$2,000). Nevertheless, reasonable expenditures to protect and enhance these important fish and wildlife species are warranted.

COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving waterways affected by the project.⁸² Under Section 10(a)(2), federal and state agencies filed 10 comprehensive plans that address various resources in Massachusetts. Of these, we identified and reviewed eight plans relevant to the Holyoke Project.⁸³

In addition to the plans filed pursuant to Section 10(a)(2)(A), we also reviewed a state plan for restoration of anadromous fish on the Connecticut River;⁸⁴ the revised Strategic Plan for the Restoration of Atlantic Salmon to the Connecticut

^{82/} The definition of "comprehensive plan" in this context is set forth at 18 C.F.R. § 2.19 (1999).

^{83/} (1) A strategic plan for the restoration of Atlantic salmon to the Connecticut River basin, Policy Committee for Fisheries Management of the Connecticut River, September 1982; (2) Massachusetts Outdoors for our Common Good: Open Space and Outdoor Recreation in Massachusetts, Massachusetts Department of Environmental Management, Division of Planning and Development, December 1988; (3) Connecticut River Basin Water Quality Management Plan, Massachusetts Department of Environmental Quality Engineering, Division of Water Pollution Control, June 1983; (4) Silvio O. Conte National Fish and Wildlife Refuge, Final Action Plan and Environmental Impact Statement, Department of the Interior, October 1995; (5) Final Environmental Impact Statement - Restoration of Atlantic salmon to New England Rivers, Department of the Interior, May 1989; (6) North American Waterfowl Management Plan, U.S. Fish and Wildlife Service, May 1986; (7) Fisheries USA - the recreational fisheries policy of the U.S. Fish and Wildlife Service, U. S. Fish and Wildlife Service, undated; and (8) the Nationwide Rivers Inventory, National Park Service, January 1982.

^{84/} Connecticut River basin fish passage, flow, and habitat alteration considerations in relation to anadromous fish restoration; Technical Committee for Fisheries Management of the Connecticut River, October 1981.

River, Connecticut River Atlantic Salmon Commission, July 1998; the Connecticut River Greenway State Park Management Plan, Massachusetts Department of Environmental Management, November 1997; a Management Plan for American Shad in the Connecticut River, Connecticut River Atlantic Salmon Commission, February 1992; Recovery plan for the Shortnose sturgeon, National Marine Fisheries Service, December 1998; and the Fisheries Management Plan for the American Eel, Atlantic States Marine Fisheries Commission, April 1999. No inconsistencies were found.

ADDITIONAL INTERVENOR ISSUES

A. Recreational Resources

1. Town of South Hadley

The Town of South Hadley commented on the Draft EIS's recommendations for meeting recreational needs at the project, arguing that there is a need to provide for quiet, non-motorized activities like walking, hiking, picnicking, and bird watching, which those recommendations fail to address. Holyoke Power had proposed to transfer to South Hadley, or grant conservation restrictions to a state agency to, approximately 700 feet of undeveloped river frontage below the Holyoke dam in South Hadley, which could then be developed for the recreational use South Hadley is advocating. Holyoke Power did not, however, propose to provide funds to develop and maintain the property for public recreation. South Hadley also proposed that the licensee provide funds to facilitate the private redevelopment of the Texon buildings, an abandoned mill complex, also owned by Holyoke Power and along the riverfront below the dam, and for restoration of strategic portions of the remains of the historic navigation canal along the South Hadley shore of the impoundment above the dam. South Hadley also objected to the recommendation that the licensee be required to construct a \$200,000 boat ramp on the South Hadley side of the river below the dam, on the ground that a nearby boat ramp downstream rendered it unnecessary.

In the Final EIS, the staff recommends, and we are adopting, revisions to the proposed recreation plan, to require Holyoke Power to provide for constructing and maintaining a trail, and appropriate recreation amenities, along the South Hadley Canal, and through the 700-foot riverfront parcel below the dam, as South Hadley proposes. The recreation plan will not include the proposed boat launch. The estimated cost to construct the required trails and amenities is about \$150,000. Furthermore, the plan requires Holyoke Power to propose some disposition or use of the Texon mill complex. Even though most of these facilities are located on property below the dam and outside of the current project boundary, we accept South Hadley's position that they are in such proximity to the dam and impoundment that they would provide for more dispersed recreational opportunities

at the project, and are therefore appropriate recreational enhancements for the project.

2. Conservation and recreation parcels on impoundment

Under the Draft EIS's recommended Comprehensive Recreation and Land Management Plan, the licensee was to provide for conservation easements on, or restricted use of, several parcels of land owned by Holyoke Power along the shore of the project impoundment, including, as proposed by Holyoke Power, the Bachelor Brook and Stony Brook parcels, and to revise the project boundary to include those parcels. In its comments on the Draft EIS, Holyoke Power states that most of these parcels are not necessary for operation of the project, and significant portions of them are neither wetlands, floodplain, nor otherwise sensitive resources, and cannot be taken for public use without compensation. Holyoke Power proposes to include within the project boundary the environmentally sensitive areas of those parcels, and a 200- to 300-foot buffer along the impoundment shoreline. Moreover, Holyoke Power proposes to grant Massachusetts DFW conservation restrictions on portions of the Bachelor Brook parcel.

In its comments on the Draft EIS, Massachusetts DEM identifies four other parcels along the impoundment shoreline that it believes should be acquired by the licensee and managed for their environmental resource or recreation value. The total area of the parcels is approximately 300 acres, and Massachusetts DEM estimates they could be acquired for \$400,000 to \$450,000. Massachusetts DEM originally proposed that such funds be provided by a recreation trust fund that the licensee would have to contribute to annually, but states that it is open to other alternatives, if the Commission is unwilling to require the licensee to establish such a trust fund.⁸⁵

We are adopting the staff's recommendation in the Final EIS that Holyoke Power be permitted to include in the required recreation and land management plan specific proposals for which portions of its Bachelor Brook and Stony Brook parcels should be included within the project boundary, subject to appropriate restrictions. We are also adopting the staff's recommendation that Holyoke Power consider means for acquiring interests in the specific shoreline properties that Massachusetts DEM suggests.

B. Environmental and Recreational Trust Funds

^{85/} Massachusetts DEM, comments filed June 1, 1999, supplemented by June 10, 1999 filing.

In addition to the development trust proposed by Municipalities, described above, there were a variety of other recommendations for requiring the establishment of trust funds as a condition of the project license. The Holyoke Dam Planning Group and the Pioneer Valley Planning Commission recommended establishing a Recreation and Cultural Resources Enhancement Fund and a River Restoration and Enhancement Fund, with an initial contribution of \$300,000, or 6 percent of the gross project revenue, whichever is greater, excluding the base amount of \$5.5 million. Interior recommended the establishment of an Environmental and Recreational Trust Fund, where annual contributions are a fixed amount based on changes in the Consumers Price Index.

The City of Holyoke recommended that Holyoke Power establish an Environmental and Recreational Trust (equivalent to the trust proposed by HG&E), should Holyoke Power receive the new license. The City also recommended that Holyoke Power establish a Holyoke Dam Development Bank to assist Holyoke and South Hadley in mitigating project-related socioeconomic impacts in the project area, as well as implementing the City's master plan for rebuilding the Canal District. The Holyoke Dam Committee recommended that Holyoke Power contribute to the socioeconomic rehabilitation of the Holyoke Canal District, and establish and fund an Environmental Trust Fund.

Massachusetts DEM recommends that the licensee provide funding for a Conservation Trust Fund to acquire lands or easements along the Connecticut River within the project vicinity. Moreover, Massachusetts DEM endorses the concept of the development trust proposed by Municipalities.

Section 10(a)(1) of the FPA requires the Commission to take into consideration all beneficial public purposes when balancing developmental and environmental values in the licensing of a hydropower project. Taking into account the record in this proceeding, we conclude that the proposed funds are not required to fulfill the project's purposes, and we will not place them in the license.⁸⁶ Nothing in the FPA requires a licensee to make whole every affected interest, or undertake or fund what may be worthwhile proposals for the general civic and economic improvement of the neighborhood.⁸⁷ Moreover, a continuing

86/ A licensee is free to enter into agreements, separate from its FERC license, to provide various services and funds, so long as the agreements entail no conflict with the license or the FPA.

87/ Thus, the FPA does not require a project's construction, operation, and maintenance to entail "no net loss" of affected resources and values, including the tax revenues of the

safeguard of the public interest is the Commission's general reserved authority to respond to evolving conditions at the project.⁸⁸

COMPREHENSIVE DEVELOPMENT

Sections 4(e) and 10(a)(1) of the FPA, 16 U.S.C. §§ 797(e) and 803(a)(1), require the Commission, in acting on applications for license, to give equal consideration to a project's power development purposes and to the purposes of energy conservation, the development of the waterway for the use or benefit of interstate commerce, 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 the waterway or waterways for all beneficial public uses, including irrigation, flood control, and water supply. The decision to license this project, and the terms and conditions included herein, reflect such consideration.

Under our approach to evaluating the economics of hydropower projects, as articulated in Mead Corp.,⁸⁹ we employ an analysis that uses current costs to compare the costs of the project and likely alternative power with no forecasts concerning potential future inflation, escalation, or deflation beyond the license issuance date. The basic purpose of our economic analysis is to provide a general estimate of the potential power benefits and the costs of a project, and reasonable alternatives to project power. The estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license.

The Holyoke Project, under the terms and conditions imposed by this license, would generate an estimated annual average of 194,000 MWh, a loss of generation of about 29,500 MWh annually from current conditions. Based on current economic conditions, without future escalation for inflation, the project would produce this power at a cost of \$9.1 million, or \$46.88 per MWh, but be able to sell the power, or purchase the power from an alternative power source for only \$40.50 per MWh, and thus produce negative net benefits of \$1.24 million per year. This

jurisdictional municipal entity. See, e.g., Ohio Power Co., 71 FERC ¶ 61,092 at p. 61,314 & n. 43 (1995).

^{88/} Id.

^{89/} 72 FERC ¶ 61,027 (1995).

compares to the positive net benefits under current license conditions of \$993,000.⁹⁰ In any event, Holyoke Power must make the business decision whether to accept this license under these terms and conditions. As we said in Mead, project economics is only one of the many public interest factors the Commission considers in determining whether or not, and under what conditions, to issue a license.⁹¹

Based on our review and evaluation of the project as proposed by Holyoke Power, with the additional enhancement measures we are adopting, we conclude that operating the project in the manner required by the license will adequately protect and enhance fish and wildlife resources, water quality, recreational resources, and cultural resources. The electricity generated from renewable water power resources will be beneficial because it will continue to offset the use of fossil-fueled, steam-electric generating plants, thereby conserving nonrenewable resources and reducing atmospheric pollution. We therefore find that Holyoke Hydroelectric Project, with the required environmental enhancement measures, is best adapted to a comprehensive plan for the use, conservation, and development of the waterway for beneficial public purposes.

LICENSE TERM

Section 15(e) of the FPA⁹² provides that any new license issued shall be for a term of not less than 30 years nor more than 50 years. The Commission's general policy is to establish 30-year terms for projects with little or no redevelopment, new construction, new capacity, or environmental mitigative and enhancement measures; 40-year terms for projects with a moderate amount of such activities; and 50-year terms for projects which propose extensive measures of these kinds. Accordingly, because this new license requires a moderate amount of environmental mitigative and enhancement measures, the license will have a term of 40 years.

SUMMARY

The Final EIS issued for this project contains background information, analysis of impacts, support for related license

90/ See Appendix B to this order, staff analysis of project economics incorporating mandatory conditions.

91/ In analyzing public interest factors, the Commission takes into consideration the fact that hydroelectric projects offer unique electric utility system operational benefits, and may provide substantial benefits not directly related to utility operations. See City of Augusta, 72 FERC ¶ 61,114 at p. 61,599 n. 57 (1995).

92/ 16 U.S.C. § 808(e).

articles, and the basis for a finding of no significant impact on the environment. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if operated and maintained in accordance with the requirements of this license.

We conclude that the Holyoke Project does not conflict with any planned or authorized development, and is best adapted to the comprehensive development of the Connecticut River for all beneficial public uses.

The Commission orders:

(A) The City of Holyoke, Massachusetts' motion to intervene in the Project No. 2004 docket is granted.

(B) The Connecticut River Watershed Council's March 17, 1998 motion to strike Municipalities' February 27, 1998 comments on environmental scoping is denied.

(C) This license is issued to Holyoke Water Power Company for a period of 40 years, effective September 1, 1999, to operate and maintain the Holyoke Hydroelectric Project. This license is subject to the terms and conditions of the Federal Power Act (FPA), which is incorporated by reference as part of this license, and subject to the regulations that the Commission issues under the provisions of the FPA.

(D) The application for a license for the Holyoke Hydroelectric Project No. 11607, filed August 29, 1997, by Ashburnham Municipal Light Plant and the Massachusetts Municipal Wholesale Electric Company, amended on January 30, 1998, to include Holyoke Gas & Electric Department of the City of Holyoke as co-applicant, is denied.

(E) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, enclosed by the project boundary shown by exhibit G, Sheets 1-27 (FERC No. 2004-1001 to No. 2004-1027.

<u>Exhibit G-</u>	<u>FERC No. 2004-</u>	<u>Showing</u>
1 to 27	1001 to 1027	Project Boundary and Vicinity

(2) Project works consisting of:

Holyoke Dam

The project dam is a granite block gravity overflow structure with a total length of 985 feet and a maximum height of about 30 feet. The dam's crest elevation is 97.47 feet and wooden flashboards currently increase the maximum normal pond elevation to 100.60 feet.⁹³ Looking upstream, a Bascule gate is located at the west end of the dam for the passage of ice and debris, and for downstream fish passage. The Bascule gate is 25 feet wide and 8.5 feet high.

Reservoir

The project reservoir has a normal maximum surface area of 2,290 acres. The elevation of the water surface at the dam at normal maximum is 100.60 feet. The useable storage capacity is about 7,025 acre-feet (AF) based on a maximum drawdown of 3 feet.

Holyoke Canal System

The Holyoke Canal system consists of three levels, referred to as First, Second, and Third Level canals. The typical water surface elevation of each of the levels is 97.5 feet, 77.5 feet and 65.0 feet, respectively. Each level of the canal system provides water for industrial use and hydropower generation.

The canal system begins with the canal gatehouse structure, located at the west end of the Hadley Falls Station which is at the west end of the dam. The gatehouse is a concrete and stone masonry substructure with a steel superstructure, and measures about 170 feet long and 65 feet wide. It houses eleven lift gates that measure 16.0 by 8.25 feet, and one lift gate that measures 11.0 by 11.0 feet.

The gatehouse discharges water into the First Level canal, a subsystem about 6,500 feet long, running through Holyoke, and including the Overflow No. 1 structure located immediately downstream of the gatehouse. This overflow structure is a 290-foot-long masonry spillway with a central gate structure about 40 feet long and 20 feet high. The masonry spillway has flashboards 4 feet high with a top elevation of 100.0 feet. The central gate structure has four wooden lift gates 7.0 feet by 5.75 feet, with a top elevation of 100.5 feet. Besides its spill function, this structure currently is being used to provide attraction water for the fishlifts at the Hadley Falls station.

^{93/} Feet, or elevations, are in National Geodetic Vertical Datum (NGVD).

The First Level canal discharges water into the Second Level canal at several user facilities and hydro stations along its length. This canal subsystem is about 12,000 feet long and is also located in Holyoke. The Second Level canal includes the Overflow No. 2 structure that discharges into the Hadley Falls Station tailrace, and the Overflow No. 3 and Overflow No. 5 structures that discharge to the Third Level canal.

Overflow No. 2, located at the north end of the Second Level canal, is a masonry spillway 105 feet long and about 30 feet high, with a raised steel-supported wooden walkway supporting the gate operators. There are a total of four steel butterfly gates, two of which are 5 feet by 4 feet and two of which are 4 feet by 3 feet. The fixed crest of the structure is surmounted with wooden flashboards about 3 feet high. Overflow No. 3 is located at the south end of the Second Level canal, and is a masonry spillway with a raised wooden superstructure to house the gate operators. The structure is 106 feet long and about 20 feet high. There are a total of four steel lift gates, two of which measure 5 by 4 feet, and two of which measure 4 by 4 feet. The fixed crest of the structure is surmounted with flashboards about 3 feet high. Overflow No. 5 is located near the north end of the Third Level canal, and consists of a masonry spillway 85 feet long and about 22 feet high. The structure includes two steel butterfly gates, each measuring 4 feet by 4 feet. The fixed crest of the structure is surmounted by wooden flashboards about 2 feet high.

The Third Level canal is supplied at several discharge points and overflows from the Second Level canal. It is about 4,000 feet in length, and is located largely at the low-lying southern end of the canal system in the city of Holyoke, mostly parallel to the bank of the Connecticut River. The Third Level canal includes the Overflow No. 4 structure located between the canal and the Connecticut River. The structure is a masonry spillway with a raised wooden superstructure housing the gate operators, and measures 85 feet in length by about 25 feet in height. There are two 4-foot by 4-foot steel lift gates and two 16.25-foot by 3-foot wooden lift gates. The fixed crest of the structure is mounted with wooden flashboards about 3 feet high.

Hydro Generating Stations

There are a total of six hydroelectric generating stations included in the project. The largest is the Hadley Falls station located at the south abutment of the Holyoke dam. The powerhouse structure is a concrete-based, steel-framed brick- and metal-sided complex. The older part was constructed in 1950 and houses Unit 1, a vertical axis Kaplan-type turbine-generator set rated at 15,800 kilowatts (kW). The dimensions in plan are 52 feet by 84 feet, and about 55 feet in height. The newer part was

constructed in 1983, and houses Unit 2, a vertical-axis fixed-blade propeller set rated at 15,000 kW.

The Boatlock station is located between the First and Second Level canals. The powerhouse structure is an L-shaped building with a concrete substructure and a brick superstructure with a length of 120 feet and widths of 42 feet and 60 feet. The power station dates from the early 1920's and houses one 500-kW unit and two 1,200-kW units. All are vertical-axis Francis units.

The Beebe-Holbrook station is also located between the First and Second Level canals, about 2,000 feet south of the Boatlock Station. The powerhouse is a concrete and brick structure with a length of 126 feet, a width of 42 feet and a height of 29 feet. The power station dates from the late 1940's and houses two units of 250 kW and 266 kW. Both units are vertical-axis Francis sets.

The Skinner station is located between the First and Second Level canals, about 1,600 feet south of the Beebe-Holbrook Station. The installation dates from 1924, and is housed in a non-project building. Water is delivered through a 150-foot long, 9-foot diameter steel penstock. There is one 300-kW vertical-axis, Francis unit.

The Riverside station is located between the Second Level canal and the Connecticut River about 3,500 feet north of the Boston & Maine Railroad bridge. The station has two distinct powerhouses of concrete and brick. Units 4, 5, 6, and 7 are housed in a structure 105 feet long, 58 feet wide and 24 feet high. Unit 4 is a 880-kW set and Unit 5 is a 600-kW set. Both are horizontal-axis Francis units. Unit 6 is also a horizontal-axis Francis unit, but it has been partially dismantled and placed in deactivated reserve status. It is rated 600-kW when active. Unit 7 is a 1,560-kW vertical-axis Francis set. Unit 8 is housed in a separate powerhouse of concrete and brick, with a length of 47 feet, a width of 35 feet, and a height of 31 feet. Unit 8 is vertical-axis propeller set, rated at 4,000 kW.

The Chemical station is located between the Third Level canal and the Connecticut River about 3,400 feet south of the railroad bridge. The installation is housed in a non-project industrial building. Water is delivered through a masonry flume about 260 feet long and 22 feet wide. The building housing the generating units is constructed of concrete and brick. The two units were installed in 1935. Unit 1 is a vertical-axis Kaplan set rated at 800 kW. Unit 2 is a vertical-axis fixed-blade set, also rated 800 kW. The tailwater is carried to the river by two covered masonry flumes, each about 125 feet long, 15 feet wide and 9.5 feet high.

Fish Passage Facilities

The upstream fish passage facilities at the Hadley Falls station consist of two fishlifts; one fishlift serves the project tailrace and a second spillway fishlift serves the project's bypassed reach (HWP, 1997). Each fishlift consists of (1) an entrance, (2) a crowding bay, (3) a lift bucket, and (4) a lift elevator. An attraction water system draws water from the First Level canal and serves both fishlifts. The two fishlifts dump into a common exit flume. A fish counting station is located midway between the fishlifts and the flume exit, which is located adjacent to the Holyoke Canal Gatehouse.

Downstream fish passage facilities at the project consist of facilities at the Holyoke dam, in the First Level canal, and at Boatlock Station (HWP, 1997). At the Holyoke dam, anadromous fish currently are passed through a Bascule gate, which is located adjacent to the intakes for the Hadley Falls Station. The Bascule gate discharges to the bypassed reach, at a point next to the entrance for the spillway fishlift.

In 1993, HWP installed a permanent louver array in the First Level canal to guide downstream migrants entering the canal system to a bypass structure, which is located adjacent to the canal wall. From the canal, fish are transported through a 3-foot steel pipe to a sampling facility located adjacent to the Hadley Falls tailrace. Fish are then discharged to the tailrace.

Prior to installing the louver array, downstream passage facilities were provided at Boatlock station. These facilities consisted of an electro-shocking system installed next to the intake for Unit 3. Once shocked, fish are transported through a 2-foot steel pipe to a raceway (i.e., tailrace for Overflow No. 2), which connects to the Hadley Falls tailrace.

In 1997, HWP constructed the Robert E. Barrett Fish Viewing Facility at the Hadley Falls station (HWP, 1997). The facility includes educational displays, an observation platform where the lifting operation can be observed and fish viewing windows where migrating fish can be observed passing through the exit flume.

Transmission Facilities

HWP does not include any transmission or distribution facilities in the project.

The project works generally described above are more specifically shown and described by those portions of exhibits A and F shown below:

Exhibit A: The following Exhibit A sections, filed on September 2, 1997:

Appendix A-1 entitled Specifications of Mechanical, Electrical and Transmission Equipment Appurtenant to the Project, describing existing and proposed mechanical, electrical, and transmission equipment.

Exhibit F: The following Exhibit F drawings, filed on September 2, 1997:

<u>Exhibit F-</u>	<u>FERC No. 2004-</u>	<u>Showing</u>
1	10028	General Plan of Project
2	10029	General Plan Holyoke Dam
3	10030	Plans and Sections-West End
4	10031	Sections, Masonry Dam, and
	Wood Dam	5 10032
Plans and Sections-East End		
6	10033	Plan of Boatlock Station
7	10034	Sections of Boatlock Sta.
8	10035	Plans and Details of No. 1
		Overflow
9	10036	Details of No. 2 and 3
		Overflows
10	10037	Details of No. 4 and 5
Overflows	11	10038 Canal
Sections		
12	10039	General Plan of Riverside
13	10040	Plan of Riverside Units No.
	4, 5, 6, and 7	
14	10041	Section at Riverside Units
	No. 4, 5, 6, and 7	
15	10042	Plan of Riverside Unit No.
	8	
16	10043	Riverside Unit No. 8
	Section Centerline	
17	10044	Beebe-Holbrook No. 1
18	10045	Beebe-Holbrook No. 2
19	10046	Details of Skinner Unit
20	10047	Hadley Falls Station-Plan
	and Section of Unit No. 1	
21	10048	Hadley Falls Station-Plan
	and Section of Unit No. 2	
22	10049	Hadley Falls No. 2-Plan at
	El. 56, 68 and 80.5	

23	10050	Hadley Falls No. 2-Cross Section	
24	10051	Hadley Falls No. 2- Elevations	
25	10052	Hadley Falls Station-East Elevation	
26	10053	Details of Chemical Units	
27	10054	U.S.G.S. Gaging Station No. 01172003	
28	10055	Fish Passage Facilities- General Plan	
29	10056	Fish Passage Facilities- Details 1 and 2	
30	10057	Fish Passage Facilities- Sections A-A and B-B	
31	10058	Fish Passage Facilities- Sections C-C and D-D	
32	10059	Fish Passage Facilities- Details 3 and 4	
33	10060	Fish Passage Facilities- Sections F-F, G-G, H-H,	J-
J and K-K			
34	10061	Fish Passage Facilities- Functional Design of Bypass General	Arrangement
35	10062	Fish Passage Facilities- Functional Design of Louvers and Bypass Sections and Details	
36	10063	Fish Passage Facilities- Functional Design of Bypass Pipe-Plan and Longitudinal Profile	

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

(F) The exhibits A, F, and G described above are approved and made part of the license.

(G) This license is subject to the articles set forth in Form L-3 (October 1975)(54 FPC 1817), entitled "Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States", and the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective as of the date of commencement of project construction or relicensing.

For the purpose of reimbursing the United States for the cost of administration of Part I of the FPA, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 42,891 kW.

Article 202. Within 45 days of the date of issuance of the license, the licensee shall file an original set and two duplicate sets of aperture cards of the approved exhibit drawings. The set of originals shall be reproduced on silver or gelatin 35mm microfilm. The duplicate sets shall be copies of the originals made on diazo-type microfilm. All microfilm shall be mounted on type D (3-1/4' X 7-3/8") aperture cards.

Prior to microfilming, the FERC Drawing Number (11214-1 through 11214-7) shall be shown in the margin below the title block of the approved drawing. After mounting, the FERC Drawing Number shall be typed on the upper right corner of each aperture card. Additionally, the Project Number, FERC Exhibit (e.g., F-1, G-1, etc.), Drawing Title, and date of this license shall be typed on the upper left corner of each aperture card.

The original and one duplicate set of aperture cards shall be filed with the Secretary of the Commission, ATTN DLC/ECRB. The remaining duplicate set of aperture cards shall be filed with the Commission's New York Regional Office.

Article 203. Pursuant to Section 10(d) of the FPA, after the first 20 years of operation of the project under license, a specified reasonable rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. One-half of the project surplus earnings, if any, accumulated after the first 20 years of operations under the license, in excess of the specified rate of return per annum on the net investment, shall be set aside in a project amortization reserve account at the end of each fiscal year. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year, the licensee shall deduct the amount of that deficiency from the amount of any surplus earnings subsequently accumulated, until absorbed. One-half of the remaining surplus earnings, if any,

cumulatively computed, shall be set aside in the project amortization reserve account. The amounts established in the project amortization reserve account shall be maintained until further order of the Commission.

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

Article 204. Authority is reserved to the Commission to require the licensee, in a proceeding specific to this license, to conduct studies, modify minimum flow releases, or otherwise make reasonable provisions for modifying project facilities or operations as necessary to comply with the Endangered Species Act, where it concerns the federally listed endangered shortnose sturgeon, threatened bald eagle, and Puritan tiger beetle.

Article 301. The licensee shall commence construction of the project works within two years from the issuance date of the license and shall complete construction of the project within 5 years from the issuance date of the license.

Article 302. The licensee shall, at least 60 days prior to the start of construction, submit one copy to the Commission's Regional Director and two copies to the Commission (one of these shall be a courtesy copy to the Director, Division of Dam Safety and Inspections), of the final contract drawings and specifications for pertinent features of the project, such as water retention structures, powerhouse or equivalent, and water conveyance structures. The licensee shall include, in the plans and specifications submitted, a soil erosion control plan. The Commission may require changes in the plans and specifications to assure a safe and adequate project. If the licensee plans substantial changes to location, size, type, or purpose of the water retention structures, powerhouse or equivalent, or water conveyance structures, the plans and specifications must be accompanied by revised Exhibit F and G drawings, as necessary.

Article 303. Within 90 days after finishing construction, the licensee shall file, for Commission approval, eight copies of

the revised exhibits A, F, and G describing the project as built. The licensee shall submit six copies to the Commission, one copy to the Commission's Regional Director, and one to the Director, Division of Licensing and Compliance.

Article 304. Within 30 days after any changes in project lands resulting from Article 418, the licensee shall file, for Commission approval, a revised Exhibit G showing the changes in project lands.

Article 305. If the Licensee's project was directly benefitted by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement during the term of the original license (including extensions of that term by annual licenses), and if those headwater benefits were not previously assessed and reimbursed to the owner of the headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for those benefits, at such time as they are assessed, in the same manner as for benefits received during the term of this new license.

Article 306. Before starting construction, the licensee shall review and approve the design of contractor-designed cofferdams and deep excavations, and shall make sure construction of cofferdams and deep excavations is consistent with the approved design. At least 30 days before starting construction of the cofferdam, the licensee shall submit one copy to the Commission's Regional Director and two copies to the Commission (one of these copies shall be a courtesy copy to the Commission's Director, Division of Dam Safety and Inspections), of the approved cofferdam construction drawings and specifications, and the letters of approval.

Article 401. The licensee shall, within 2 years of license issuance, install an inflatable rubber dam at the Holyoke dam and provide for the operation and maintenance of the rubber dam once constructed.

Within 180 days from the date of issuance of this license, the licensee shall file, for Commission approval, a plan to replace the existing wooden flashboards along the crest of the Holyoke dam with an inflatable rubber dam. The plan shall specify how the licensee will minimize construction-related effects on water quality, fisheries and aquatic resources, and recreational activities during construction and installation, and ensure that the rubber dam is properly operated and maintained for the period of the license.

The plan shall include, but not be limited to: (1) functional design drawings; (2) an installation and implementation schedule; (3) procedures for installing the rubber

dam, including measures to maintain impoundment elevations as specified by Article 405, and minimizing effects on impoundment boaters during the period of installation as stipulated in Article 419; (4) appropriate sediment and erosion control measures as required by Article 402; and (5) a provision to release the minimum flow and zone-of-passage flow required by this license during installation of the rubber dam, unless it can be demonstrated to the Commission that maintaining such flows is not feasible or is inconsistent with the safe and prudent operation of the project.

The licensee shall prepare the plan after consultation with the aforementioned agencies. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission. Any flow release mechanism(s) or structure(s) constructed by the licensee shall be shown on the as-built drawings filed pursuant to Article 303 of this license.

Article 402. At least 90 days before the start of any construction-related activities, including but not limited to land-disturbing, land-clearing, and spoil-producing activities, the licensee shall file, with the Commission for approval, and with the Massachusetts Department of Environmental Protection (MDEP), a final construction control plan for the purpose of controlling erosion, bank stability, sedimentation, turbidity, and water pollutant effects.

Relevant plans shall be developed for all construction-related activities, including but not limited to, construction of the rubber dam, Overflow No. 2 weir, Bascule gate fly-over, eel ladder, canal sandbag weirs, and excavation activities in the tailrace. The plan shall be based on: (1) actual-site geological, soil, slope, and groundwater conditions; and (2) the final project designs for all associated temporary and permanent features.

The plan shall contain, at a minimum, the following six items:

- (1) a description of the actual site conditions;

- (2) measures proposed to control erosion, to prevent slope instability, and to minimize the quantity of sediment resulting from construction activities;
- (3) detailed descriptions, final drawings and specifications, and specific topographic locations of all control measures;
- (4) specific details of site preparation and restoration including grading, revegetation, and fuel storage;
- (5) pre-construction sediment sampling in areas with potential contaminated sediments with a requirement for removing any contaminated sediments found prior to construction; and
- (6) a specific implementation schedule and details for monitoring and maintenance programs during construction activities and site restoration.

The licensee shall prepare the plan after consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the MDEP and the Massachusetts Division of Fisheries and Wildlife. The licensee shall include with the plan documentation of consultation with the agencies and copies of agency comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the plan accommodates all agency comments and recommendations. The licensee shall allow a minimum of 30 days for the agencies to comment and make recommendations prior to filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on geological, soil, and groundwater conditions at the site.

The Commission reserves the right to require changes to the plan. No construction-related activities shall begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 403. Within 180 days after the date of issuance of this license, the licensee shall file, for Commission approval, a plan for inventorying, evaluating, stabilizing and monitoring shoreline erosion sites in the project area. Inventorying and evaluating components of the plan shall apply to all shoreline erosion sites that have been identified in either of the license applications filed for the project, but not limited to these sites. Stabilization of erosion sites shall only apply to those sites that are shown to have been caused by past and present project operations as determined from the results of site evaluations.

The plan shall include, at a minimum, the following items:

- (1) a report, with supporting information, that identifies the characteristics of each site, such as the length, height, adjacent land use, identifiable effects (e.g., natural vegetation loss, farmland loss, infrastructure damage--roads, pipelines), and the cause of erosion for each site;
- (2) a general map of the project area that identifies and shows the location of each of the erosion sites and adjacent land use;
- (3) detailed descriptions, functional design drawings, and specific topographic locations for all remediation measures proposed for each of the sites identified for remediation;
- (4) a specific implementation schedule and detailed cost estimates for the remediation treatments described in item (c) above, specific provisions for obtaining necessary permits and property owner agreements for plan implementation, and specific provisions for the ongoing monitoring and maintenance of the specified treatment measures, after their implementation, to ensure their long-term effectiveness.

The licensee shall prepare the plan after consultation with the National Resources Conservation Service, the Massachusetts Department of Environmental Management, the Massachusetts Department of Environmental Protection, and regional and local agencies as appropriate. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the consulted entities, and specific descriptions of how the consulted entities' recommendations are accommodated by the plan. The licensee shall allow a minimum of 30 days for the consulted entities to comment on the plan and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on actual site conditions.

The Commission reserves the right to require changes to the plan. No erosion site remediation work shall begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission. The licensee shall solicit and coordinate the cooperation of other parties in implementing the approved plan.

Article 404. Within 180 days from the date of issuance of this license, the licensee shall file, for Commission approval, a water quality monitoring plan. The plan shall ensure, to the degree possible through the operation of the Holyoke Project, that state and federal water quality standards are met.

The objectives of the water quality monitoring plan shall be to: (1) monitor the effects of project operation on project waters and the Connecticut River downstream of the Holyoke Project; (2) determine if bypassed reach minimum flows required by this license are adequate to ensure that water temperature and dissolved oxygen meet state standards; and (3) monitor the effects of construction-related activity on water quality. The water quality monitoring plan shall include periodic or continuous water quality sampling at sites within the project impoundment and Hadley Falls tailrace, Holyoke canal system, bypassed reach, and appropriate areas downstream from the project, and for periods and seasons sufficient to determine compliance with water quality standards, including dissolved oxygen, dissolved nitrogen, water temperature, and fecal coliform. At a minimum, the sites shall include the Hadley Falls station intake and Cove Island, below the Bascule gate, and in the Hadley Falls tailrace, the project bypassed reach and the Holyoke canals.

The plan shall include, but not be limited to: (1) a description of sampling locations and frequencies, parameters to be measured, and the analytical methods; (2) descriptions of all mechanisms and structures used to monitor water quality; (3) the methods for recording and maintaining data, and providing relevant data to the Commission and resource agencies for review; and (4) an evaluation of monitoring results and appropriate recommendations for further actions, if needed.

The plan also shall include a schedule for: (1) implementation of the monitoring plan; (2) consultation with the appropriate federal and state agencies concerning the results of the monitoring; and (3) filing the results, agency comments, and licensee's response to agency comments with the Commission.

The licensee shall prepare the monitoring plan after consultation with the U.S. Fish and Wildlife Service, the Massachusetts Division of Fisheries and Wildlife, and the Massachusetts Department of Environmental Protection. The licensee shall include with the monitoring plan documentation of consultation and copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the monitoring plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations prior to filing the monitoring plan with the Commission. If the licensee does not adopt a recommendation, the

filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the monitoring plan. Upon Commission approval, the licensee shall implement the monitoring plan, including any changes required by the Commission. If the results of monitoring indicate that changes in project structures or operations are necessary to ensure compliance with state water quality standards, the Commission may direct the licensee to modify project structures or operations.

Article 405. The licensee shall operate the project in a run-of-river mode and maintain a minimum impoundment elevation of 100.6 feet National Geodetic Vertical Datum with an allowable fluctuation of ± 0.2 foot for the protection of water quality, aquatic and fisheries, and recreational resources of the Holyoke Project and Connecticut River.

The licensee shall at all times act to minimize the fluctuation of the impoundment surface elevation by maintaining a discharge from the project so that, at any point in time, flows, as measured immediately downstream of the project tailrace, approximate the sum of the inflows to the project impoundment.

The run-of-river mode operation and minimum impoundment surface elevation may be temporarily modified if required by operating emergencies beyond the control of the licensee (e.g., extreme runoff events, droughts, ice conditions, equipment failure, or flood storage requirements), and for short periods upon mutual agreement between the licensee, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Massachusetts Department of Environmental Protection, and the Massachusetts Division of Fisheries and Wildlife. If project operations are so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each incident.

Article 406. The licensee shall release seasonally-adjusted minimum flows into the bypassed reach and canal system for the protection and enhancement of water quality and aquatic and fisheries resources.

The licensee shall release continuous instantaneous minimum flows to the bypassed reach as follows:

<u>Period</u>	<u>Flow</u>
July 16 through March 31	at least 420 cfs, or impoundment inflow, whichever is less

April 1 through July 15	at least 800 cfs, or impoundment inflow, whichever is less
----------------------------	--

The licensee shall release continuous instantaneous minimum flows to the canal system as follows:

<u>Period</u>	<u>Flow</u>
April 1 through November 15	at least 810 cfs, or impoundment inflow minus fish passage and bypassed reach minimum flows, whichever is less
November 16 through March 31	at least 400 cfs, or impoundment inflow minus fish passage and bypassed reach minimum flows, whichever is less

The licensee shall operate the Holyoke Project according to the following flow prioritization scheme: (1) fish passage flows (Articles 411, 412, and 413); (2) bypassed reach flows; (3) minimum canal flows; and (4) hydroelectric generation, to the extent that such priorities do not conflict with Condition 16 of the Section 401 water quality certification attached as part of this license.

The licensee shall specify the methods for operating and releasing bypassed reach and canal system minimum flows as required by Article 407 of this license, and shall monitor compliance with the minimum flows as required by Article 408.

Releases from the Holyoke Project may be temporarily modified if required by operating emergencies beyond the control of the licensee (e.g., extreme runoff events, droughts, ice conditions, equipment failure, or flood storage requirements), or for short periods upon mutual agreement between the licensee, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Massachusetts Department of Environmental Protection, and the Massachusetts Division of Fisheries and Wildlife. If the flows are so modified, the licensee shall notify the Commission in advance if known or as soon as possible otherwise, but no later than 10 days after each such incident, and shall provide the reason for the modified flow.

Changes to this article's minimum flow requirements may be made through the provisions outlined in the monitoring plans required by Articles 404, 409, and 410. If the information reported pursuant to these articles indicates that a different flow regime is needed to protect and enhance water quality or

aquatic and fisheries resources in the project vicinity of the Connecticut River, the Commission may require such changes.

Article 407. Within 180 days from the date of issuance of this license, the licensee shall file, for Commission approval, a plan describing the methods for operating the Holyoke Project and releasing flows at the project, in accordance with the operational and flow requirements of this license, including run-of-river operation, bypass flows, and fish passage operational flows.

The plan shall also include, but not be limited to, a description of: (1) the mechanism(s) and structure(s) that the licensee proposes to use; (2) the level of manned and automatic operation of the flow release structure(s); (3) the project modifications needed to fully implement run-of-river operations; and (4) how the operational and flow requirements of this license (including the flows required by Articles 411, 412, and 413) will be maintained during low-flow and normal operating conditions, as well as before, during or after any improvements (e.g., installation of the rubber dam and fish passage facilities), maintenance and/or repairs to the project. Particular attention shall be directed to the rubber dam and its operation and role in minimum flow releases to the bypassed reach.

The plan also shall include a schedule for: (1) implementation of the plan; (2) consultation with the appropriate federal and state agencies concerning the proposed method(s) of releasing the required flows; and (3) filing the agency comments and licensee's response to agency comments with the Commission.

The licensee shall prepare the plan after consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Massachusetts Division of Fisheries and Wildlife, and the Massachusetts Department of Environmental Protection. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Construction of any flow release mechanism(s) or structure(s) shall not begin until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission according to the approved schedule. Any flow release mechanism(s) or structure(s)

constructed by the licensee shall be shown on the as-built drawings filed pursuant to Article 303 of this license.

If the information reported pursuant to Articles 404, 408, and 410 indicates that a different flow regime or method of achieving the flow regime is necessary to provide adequate protection and enhancement of water quality or aquatic and fisheries resources in the project vicinity of the Connecticut River, the Commission may require such changes.

Article 408. Within 180 days from the date of issuance of this license, the licensee shall file, for Commission approval, a plan to monitor run-of-river operation, as well as the minimum flows and fish passage flows required by this license.

The plan shall provide a means to: (1) independently verify compliance with run-of-river operation and the minimum flow requirements of this license, before and after installation of the rubber dam; and (2) allow agencies to consult regarding the methods to be used. The plan shall identify the flow and operations monitoring methods and locations necessary to ensure that flows are released in a manner consistent with Articles 409 and 410, including canal flow circulation and distribution of flows in the bypassed reach (including channel-specific and total bypass flows, as necessary).

The plan shall include, but not be limited to: (1) planned locations of the flow measuring devices; (2) specific measures that would ensure that the monitoring system would operate under all conditions; (3) the design of the devices, including any pertinent hydraulic calculations and technical specifications of proposed instrumentation; (4) descriptions of the relative extent of manned versus automatic operation of the monitoring equipment; (5) descriptions of the methods and schedule for calibration of the monitoring equipment; (6) the method of flow data collection and provisions for providing data to the regulatory agencies to verify compliance; and (7) measures to verify accuracy of flow measurements or releases following any substantial modification of flow release structures.

The plan also shall include a schedule for (1) installing all operational measuring devices; (2) implementing the plan; (3) consulting with the appropriate federal and state agencies concerning the data from the monitoring; and (4) filing the data, agency comments, and licensee's response to agency comments with the Commission.

The monitoring plan shall include provisions consistent with the emergency notification requirements for run-of-river operation and the minimum flows required by this license. In addition, should impoundment elevations or minimum flows, as measured by the approved monitoring plan, fall below the levels required by this license, the plan shall include a provision

whereby the licensee files with the Commission a report of the incident within 30 days of the incident. The licensee shall prepare the report in consultation with the U.S. Fish and Wildlife Service (FWS)

The report shall, to the extent possible, identify the cause, severity, and duration of the incident, and any observed or reported adverse environmental impacts resulting from the incident. The report also shall include: (1) operational data necessary to determine compliance with this article; (2) a description of any corrective measures implemented at the time of the occurrence and the measures implemented or proposed to ensure that similar incidents do not recur; and (3) comments or correspondence, if any, received from FWS, NMFS, MDFW, and MDEP regarding the incident. Based on the report and the Commission's evaluation of the incident, the Commission reserves the right to require modifications to project facilities and operations to ensure future compliance.

The licensee shall prepare the plan after consultation with the FWS, the U.S. Geological Survey, NMFS, MDFW, and MDEP. The licensee shall include with the plan documentation of agency consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on site-specific information.

The Commission reserves the right to require changes to the plan. No ground-disturbing or land-clearing activities for installation and use of monitoring devices shall begin until the licensee is notified that the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 409. Within 180 days from the date of issuance of this license, the licensee shall file, for Commission approval, a comprehensive canal operations plan. The plan shall describe the operational and maintenance measures that will be used to protect and enhance water quality and mussel populations in the canal system.

The plan shall include, but not be limited to: (1) a description of how the minimum flows required by the license will be circulated through the three-level canal system to improve and maintain water quality and aesthetic conditions; (2) specific procedures for installing a sandbag weir, or other appropriate measures, to maintain watered conditions in areas of the canal

necessary to maintain mussel habitat; (3) description of any modification of structures necessary to achieve minimum canal flow requirements and conditions protective of mussels during maintenance drawdowns; (4) a description of how the minimum canal flows required by this license will be maintained during canal maintenance drawdowns; and (5) a method and schedule for monitoring the effectiveness of minimum canal flow requirements in protecting and enhancing mussel populations per Article 410.

The plan also shall include a schedule for: (1) implementation of the monitoring plan; (2) consultation with the appropriate federal and state agencies concerning the results of the monitoring; and (3) filing the results, agency comments, and licensee's response to agency comments with the Commission.

The licensee shall prepare the plan after consultation with the U.S. Fish and Wildlife Service, Massachusetts Division of Fisheries and Wildlife, and Massachusetts Department of Environmental Protection. The licensee shall include with the plan documentation of agency consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on site-specific information.

The Commission reserves the right to require changes to the plan. No ground-disturbing or land-clearing activities for installation and use of monitoring devices shall begin until the licensee is notified the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission. If the results of monitoring indicate that changes in project structures or operations are necessary to protect and enhance water quality and mussel populations in the canal system (e.g., canal operations and/or structures), the Commission may direct the licensee to modify project structures or operations.

Article 410. Within 180 days after the date of issuance of this license, the licensee shall file, for Commission approval, a plan to monitor fish and aquatic habitat and fish populations within the bypassed reach and the Holyoke canals. The plan shall provide for monitoring the effectiveness of the bypassed reach and canal flows and other measures in protecting and enhancing fish and mussel habitat conditions and populations, and to determine the need for additional enhancement measures.

The plan shall include methods to monitor and assess: (1) the adequacy of bypassed reach flows to provide a safe zone of

passage for anadromous fish through the bypassed reach; (2) the occurrence of fish stranding in the bypassed reach; (3) fish populations in the bypassed reach; and (4) changes in canal mussel populations and the adequacy of the sandbag weir, minimum flows, and drawdown procedures for protecting mussel populations in the canal system.

As part of the monitoring plan, the licensee shall determine the need for additional measures to ensure or enhance the safe passage of shortnose sturgeon through the bypassed reach as required by Articles 412 and 416. Such measures may include, but not be limited to: (1) changes in zone-of-passage flows and/or timing (pulsed flows); (2) changes in bypass aquatic habitat flows; and/or (3) bypass reach channel modifications. The plan shall include working in conjunction with the Connecticut River Shortnose Sturgeon Working Group and/or its findings to determine the most beneficial project modifications that would meet plan requirements and protection measures for the shortnose sturgeon.

The plan shall include a schedule for: (1) implementing the plan; (2) consulting with the appropriate federal and state agencies concerning the results of the study and any additional measures needed to protect aquatic and fisheries resources and mussel populations; (3) reporting on a biannual, or other appropriate interval, on anadromous fish and mussel populations, with a final report and recommendations at the end of the agreed-to monitoring period; and (4) filing the results, agency comments, and the licensee's response to agency comments with the Commission. The final report shall: (1) identify the changes in populations over time; (2) outline the proposals for changes in operations or structures, if any, to protect and enhance fish or mussel populations; and (3) discuss the basis and need for continued monitoring.

The licensee shall prepare the monitoring plan after consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, the Massachusetts Division of Fisheries and Wildlife, Massachusetts Department of Environmental Protection, and Connecticut River Atlantic Salmon Commission (CRASC). The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the proposed methodology, and an implementation schedule after the plan has been provided to the agencies listed above. The licensee shall allow a minimum of 30 days for the agencies listed to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Implementation of the plan shall not commence until the

licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

If the results of the monitoring plan indicate that changes in project structures or operations (including any measures identified by the licensee, the aforementioned agencies, or CRASC resulting from consultation required by this article) are necessary to protect aquatic and fisheries resources, the Commission may direct the licensee to modify project structures or operations accordingly.

Article 411. The licensee shall install, operate, and maintain downstream fish passage facilities at the Holyoke Project to provide efficient downstream fish passage for a variety of anadromous fish species past the project.

Within 180 days after the date of issuance of this license, the licensee shall file, for Commission approval, a plan to install, operate, maintain, and, as appropriate, evaluate downstream fish passage facilities at the Holyoke Project that includes, but is not limited to:

- (1) provisions for the continued operation of the canal louver bypass facility and the Boatlock station downstream fish passage facility (as necessary), as well as the operation of the proposed Bascule gate downstream fish passage facility once installed;
- (2) a provision to operate the downstream fish passage facilities, as identified below, during the designated migration period whenever the Hadley Falls station is operating or generation flows are provided in the First Level canal --

<u>Species</u>	<u>Downstream</u>
Atlantic salmon	4/1 - 6/15 (juv.)
	Fall/Winter (adult)
American shad &	6/1 - 7/31 (adult)
Blueback herring	9/1 - 11/15 (juv.)
Shortnose sturgeon	4/1 - 11/15 (adult)
American eel	8/15 - 11/15
	Undetermined spring run

- (3) a schedule for implementing the provisions of this plan, including the installation of all facilities and structures, except as specifically noted, within two years of license issuance;
- (4) provisions to notify the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), Massachusetts Division of Fisheries and Wildlife

(MDFW), and Connecticut River Atlantic Salmon Commission (CRASC) of any extensions of time to comply with the provisions of this plan;

- (5) provisions for: (a) maintaining the fish passage facilities in proper order and keeping such facilities clear of trash, logs, and material that would hinder passage; (b) performing maintenance such that the fish passage facilities would operate effectively prior to and during the migratory periods; and (c) developing a fish passage maintenance plan describing the anticipated maintenance, a maintenance schedule, and contingencies;
- (6) a provision to allow agency personnel access to the project site and to pertinent project records, for the purpose of inspecting the fish passage facilities;
- (7) a provision to construct the downstream fish passage facility at the spillway Bascule gate (i.e., fly-over), with a surface intake, conforming to the design depicted in hydraulic model studies undertaken by Holyoke Power, including measures to manage flows that are shed through the structure to eliminate interference with the spillway fishlift attraction flows;
- (8) specification of the operational flows for the Bascule gate [i.e., 600 cubic feet per second (cfs)], louver bypass, and Boatlock station downstream fish passage facilities;
- (9) a provision to design, model, and install an angled (.45E) bar rack in the Hadley Falls station forebay, with 1-inch clear bar spacing, leading to a downstream fish bypass entrance/conveyance structure located at the existing Bascule gate, or at the rubber dam;
- (10) an evaluation of the existing surface bypass and partial-depth louver structure in the First Level canal, as well as other reasonable measures, for providing downstream passage of shortnose sturgeon and American eel;
- (11) a provision to continue operating the existing Boatlock station downstream migrant facility, and an evaluation of the facility to determine whether the facility should cease operation;
- (12) the estimated capital cost of installing the facilities, the estimated annual costs of operating and

maintaining the facilities, and the cost, in lost generation, of operating the facilities; and

- (10) provisions for providing any proposals to modify existing facilities and/or install new facilities, relative to the evaluations of Items 9, 10, and 11 above, as well as the monitoring required by Article 414, to the aforementioned agencies and the Commission.

The licensee shall prepare the aforementioned plan for downstream fish passage (including all functional and final designs, construction schedules, and hydraulic modeling or other studies) after consultation with FWS, the NMFS, MDFW, the Massachusetts Department of Environmental Protection, and CRASC. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the plan after it has been prepared and provided to the agencies and CRASC, and specific descriptions of how the agencies' and CRASC's comments are accommodated by the licensee's plan. The licensee shall allow a minimum of 30 days for the agencies and CRASC to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Implementation of any provision outlined in the plan shall not commence until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission. Any structure built in accordance with this plan shall be shown on the as-built drawings filed pursuant to Article 303 of this license.

Article 412. The licensee shall install, operate, and maintain upstream fish passage facilities at the Holyoke Project to provide efficient upstream fish passage for a variety of anadromous fish species past the project.

Within 180 days after the date of issuance of this license, the licensee shall file with the Commission, for approval, a plan to install, operate, maintain, and, as appropriate, evaluate upstream fish passage facilities at the Holyoke Project that includes, but is not limited to:

- (1) provisions for the continued operation of the tailrace and spillway fishlifts;
- (2) specification of the design population for each target species (i.e., 1,000,000 each for American shad and blueback herring; 6,000 for Atlantic salmon;

unquantified for American eels, and an estimated 500 shortnose sturgeon);

- (3) a provision to operate the upstream fishlifts during the designated migration seasons, as identified below, at flows up to 40,000 cubic feet per second (cfs), as measured at USGS Gage No. 01172003 --

<u>Species</u>	<u>Upstream</u>
Atlantic salmon	4/1 - 7/15
	9/15 - 11/15
American shad & Blueback herring	4/1 - 7/15
Shortnose sturgeon	6/1 - 11/15
American eel	4/1 - 11/15

- (4) a schedule for implementing the provisions of this plan, including the installation of all facilities and structures, except as specifically noted, within two years of license issuance;
- (5) provisions to notify the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), Massachusetts Division of Fisheries and Wildlife (MDFW), and Connecticut River Atlantic Salmon Commission (CRASC) of any extensions of time to comply with the provisions of this plan;
- (6) provisions for: (a) maintaining the fish passage facilities in proper order and keeping such facilities clear of trash, logs, and material that would hinder passage; (b) performing maintenance such that the fish passage facilities would operate effectively prior to and during the migratory periods; and (c) developing a fish passage maintenance plan describing the anticipated maintenance, a maintenance schedule, and contingencies;
- (7) a provision to allow agency personnel access to the project site and to pertinent project records, for the purpose of inspecting the fish passage facilities;
- (8) a provision to make necessary physical modifications to the upstream fishlift system to ensure operation up to 40,000 cfs, and to provide at least 12 inches of freeboard from operating water levels in the fishlifts to the top of the fishlift walls and fish crowders;
- (9) a provision to expand the spillway and tailrace fishlifts by (a) increasing width of the spillway entrance and the spillway entrance channel to 8 feet, (b) providing attraction flows of 200 cfs at the

spillway fishlift entrance and 120 cfs at each of the tailrace fishlift's entrance, (c) increasing the tailrace fishlift hopper capacity to 330 cubic feet, (d) increasing the spillway fishlift hopper capacity to 460 cubic feet, (e) increasing the width of the fishlift exit channel to 14 feet from the fishlift hoppers to the counting station and 10 feet beyond, and (f) providing an adjustable back lighted panel at all fish counting station windows;

- (10) a provision to install a second fish trapping and counting station in the fishlift exit channel;
- (11) a provision to (a) install a new fish trapping and hauling system, as proposed by HG&E (see response to additional information request, Item 6.C.3, filed December 23, 1998), or, (b) if such a facility is determined not to be feasible, evaluate other mechanisms and/or procedures to enhance trapping and hauling operations at the Holyoke Project, and provide any relevant proposals in this regard;
- (12) provisions to remove the rock-outcropping at the entrance of the tailrace fishlift below Unit #2 to allow efficient operation of this entrance, and provide bottom-level access to the tailrace and spillway fishlifts, as necessary;
- (13) a provision to construct a barrier at the confluence of the Hadley Falls tailrace and the Overflow No. 2 channel; and
- (14) the estimated capital cost of installing the facilities, the estimated annual costs of operating and maintaining the facilities, and the cost, in lost generation, of operating the facilities.
- (15) provisions for providing any proposals to modify existing facilities and/or install new facilities, relative to the monitoring required by Article 414, to the aforementioned agencies and the Commission.

The licensee shall prepare the aforementioned plan for upstream fish passage (including all functional and final designs, construction schedules, and hydraulic modelling or other studies) after consultation with FWS, NMFS MDFW, Massachusetts Department of Environmental Protection, and CRASC. The licensee shall include with the plan, documentation of consultation, copies of comments and recommendations on the plan after it has been prepared and provided to the agencies and CRASC, and specific descriptions of how the agencies' and CRASC's comments are accommodated by the licensee's plan. The licensee shall

allow a minimum of 30 days for the agencies and CRASC to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Implementation of any provision outlined in the plan shall not commence until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission. Any structure built in accordance with this plan shall be shown on the as-built drawings filed pursuant to Article 303 of this license.

Article 413. The licensee shall install, operate, and maintain appropriate upstream and downstream fish passage facilities at the Holyoke Project to provide efficient fish passage for American eel past the project.

Within 180 days after the date of issuance of this license, the licensee shall file with the Commission, for approval, a plan to install, operate, maintain, and, as appropriate, evaluate upstream and downstream fish passage facilities at the Holyoke Project that includes, but is not limited to:

- (1) a provision to operate the upstream and downstream fish passage facilities for American eel, once constructed, in accordance with the schedules identified in Articles 411 and 412;
- (2) a schedule for implementing the provisions of this plan, including the installation of all facilities and structures, except as specifically noted, within two years of license issuance;
- (3) provisions to notify the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), Massachusetts Division of Fisheries and Wildlife (MDFW), and Connecticut River Atlantic Salmon Commission (CRASC) of any extensions of time to comply with the provisions of this plan;
- (4) provisions for: (a) maintaining the fish passage facilities in proper order and keeping such facilities clear of trash, logs, and material that would hinder passage; (b) performing maintenance such that the fish passage facilities would operate effectively prior to and during the migratory periods; and (c) developing a fish passage maintenance plan describing the anticipated maintenance, a maintenance schedule, and contingencies;

- (5) a provision to allow agency personnel access to the project site and to pertinent project records, for the purpose of inspecting the fish passage facilities;
- (6) a provision to construct three upstream fish ladders for American eels, including final functional design drawings for: (a) one ladder on the South Hadley side of the Holyoke dam [see Holyoke Power's response to Item 6 in HWP (1998c)], and (b) one eel ladder at each of the spillway and tailrace fishlifts [see Figures 6(A)-1 and 6(A)-2 of HG&E (1998b)];
- (7) specification of the operational flows for the upstream and downstream fish passage facilities, including the upstream eel ladders installed in accordance with Item (6) above;
- (8) provisions to: (a) install an angled bar rack as stipulated in Article 411; (b) study out-migrating, silver-phase, American eels at the Holyoke Project; and (c) evaluate the canal louver facility and other reasonable measures to provide downstream passage of American eel, as stipulated in Article 411;
- (9) the estimated capital cost of installing the facilities, the estimated annual costs of operating and maintaining the facilities, and the cost, in lost generation, of operating the facilities; and
- (10) provisions for providing any proposals to modify existing facilities and/or install new facilities, relative to the evaluations of Items 8(b) and 8(c) above, and the monitoring required by Article 414, to the aforementioned agencies and the Commission.

The licensee shall prepare the aforementioned plan for American eel passage and protection (including all functional and final designs, construction schedules, and hydraulic modelling or other studies) after consultation with FWS, NMFS, MDFW, the Massachusetts Department of Environmental Protection, and CRASC. The licensee shall include with the plan documentation of consultation; copies of comments and recommendations on the plan after it has been prepared and provided to the agencies and CRASC; and specific descriptions of how the agencies' and CRASC's comments are accommodated by the licensee's plan. The licensee shall allow a minimum of 30 days for the agencies and CRASC to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Implementation of any provision outlined in the plan shall not commence until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission. Any structure built in accordance with this plan shall be shown on the as-built drawings filed pursuant to Article 303 of this license.

Article 414. Upon completing construction of new, or modifications to existing, upstream and downstream fish passage facilities required by Articles 411, 412, and 413, the licensee shall monitor the use and effectiveness of the upstream and downstream fish passage facilities.

Within 180 days after the date of issuance of this license, the licensee shall file, for Commission approval, a plan for post-construction studies to monitor the effectiveness of the new or modified upstream and downstream fish passage facilities, and the associated operational and attraction flows, to efficiently pass upstream and downstream migrating anadromous fish. The plan shall include a provision to modify the upstream and downstream fish passage facilities at the project, project facilities and/or operation, or the bypass channel configuration, as needed, to ensure effective fish passage.

The monitoring plan shall include the specific provisions for monitoring the effectiveness of the new or modified upstream and downstream fish passage facilities, as well as a schedule for: (1) implementation of the plan; (2) consultation with the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), Massachusetts Division of Fisheries & Wildlife (MDFW), and Connecticut River Atlantic Salmon Commission (CRASC) concerning the results of the monitoring; and (3) filing the results, the agencies', and CRASC's comments, and the licensee's response to the agency and CRASC comments, with the Commission.

The licensee shall prepare the aforementioned fish passage monitoring plan after consultation with FWS, NMFS, MDFW, Massachusetts Department of Environmental Protection, and CRASC. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the plan after it has been prepared and provided to the agencies and CRASC, and specific descriptions of how the agencies' and CRASC's comments are accommodated by the licensee's plan. The licensee shall allow a minimum of 30 days for the agencies and CRASC to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Implementation of any provision outlined in the plan shall

not commence until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

If the results of the monitoring indicate that changes in project structures or operations, including alternative flow requirements, are necessary to facilitate fish passage, the Commission may direct the licensee to make such reasonable changes in the design of the facilities and/or operations, as necessary.

Article 415. Authority is reserved to the Commission to require the Licensee to construct, operate, and maintain, or to provide for the construction, operation, and maintenance of, such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate, pursuant to Section 18 of the Federal Power Act.

Article 416. Within one year after the date of issuance of this license, the licensee shall, after consultation with the U.S. Fish and Wildlife Service (FWS), Silvio O. Conte National Fish and Wildlife Refuge (Refuge), National Marine Fisheries Service (NMFS), Massachusetts Division of Fisheries and Wildlife (MDFW), and Massachusetts Department of Environmental Protection (MDEP), as appropriate, file for Commission approval a Threatened and Endangered Species Protection Plan (T&E Plan) for the Holyoke Project. The T&E Plan shall include the federally listed endangered shortnose sturgeon (*Acipenser brevirostrum*), and threatened bald eagle (*Haliaeetus leucocephalus*) and Puritan tiger beetle (*Cicindela puritana*), and shall include, but not necessarily limited to, the state listed endangered yellow lampmussel (*Lampsilis cariosa*) and dwarf wedge mussel (*Alismidonta heterodon*).

The T&E Plan shall include, but not be limited to, the following:

- (1) measures to enhance bald eagle nesting sites (i.e., by erecting eagle nest platforms) and to protect and enhance eagle perching and feeding activities; a commitment to cooperate with the FWS, MDFW, and MDEM to continue educating the public and policing recreational activities at Puritan tiger beetle habitat sites (particularly at Rainbow Beach), and develop other protective measures, such as no-wake zones; measures to protect and enhance shortnose sturgeon habitat consistent with the measures developed as the result of the on-going shortnose sturgeon studies and the provisions of Articles 405, 406, 411, and 412; and measures to protect and enhance the yellow lampmussel

and dwarf wedgemussel, as identified in the canal operations plan (Article 409);

- (2) a schedule for implementing the measures;
- (3) a description of the method for monitoring the results of the implemented measures;
- (4) a monitoring schedule; and
- (5) a schedule for providing the monitoring results to FWS, the Refuge, NMFS, MDFW, and the Commission.

The licensee shall include in the T&E Plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to FWS, the Refuge, NMFS, MDFW, and MDEP, and descriptions of how the agencies' comments and recommendations are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the Licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the T&E Plan, including any changes required by the Commission.

Article 417. Within 180 days of the issuance date of this license, the licensee, after consultation with the U.S. Fish and Wildlife Service (FWS, Massachusetts Division of Fisheries and Wildlife (MDFW), and Massachusetts Department of Environmental Protection (MDEP), file for Commission approval a plan to monitor purple loosestrife (*Lythrum salicaria*), water chestnut (*Trapa natans*), and zebra mussel (*Dreissena polymorpha*) in project waters.

The plan shall include, but not be limited to:

- (1) a description of the monitoring method;
- (2) a monitoring schedule;
- (3) a schedule for providing the monitoring results to FWS and MDFW;
- (4) documentation of agency consultation, including copies of comments and recommendations on the completed plan; and
- (5) specific descriptions of how the agencies' comments are accommodated by the plan.

The licensee shall allow a minimum of 30 days for the agencies to comment on the plan and to make recommendations prior to filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons based on project-specific information. The Commission reserves the right to require changes to the plan.

If at any time during the term of the license, the FWS and/or the MDFW demonstrate that purple loosestrife, water chestnut, or zebra mussels are significantly affecting fish and wildlife populations at the project and control measures are needed, and the Commission agrees with those determinations, the Commission may require the licensee to cooperate with the FWS and the MDFW to undertake reasonable measures to control or eliminate these species in project waters.

Article 418. Within 180 days after the date of issuance of this license, the licensee shall, after consultation with the agencies and non-governmental organizations specified herein, develop and file, for Commission approval, a Comprehensive Recreation and Land Management Plan (CRLMP) for the Holyoke Project. The CRLMP shall include a Recreation Plan, Land Management Plan, and Buffer Zone Management Plan.

The licensee shall include in the CRLMP documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the City of Holyoke, Connecticut River Channel Marking Committee, Massachusetts Division of Fisheries and Wildlife, Massachusetts Department of Environmental Management, Massachusetts Department of Environmental Protection, Connecticut River Greenway State Park, Trustees of Reservation, U.S. National Park Service, Pioneer Valley Planning Council, Town of South Hadley, Department of the Interior, National Marine Fisheries Service, local marinas, Connecticut River Watershed Council, and Trout Unlimited; and specific descriptions of how the consulted parties' comments and recommendations are accommodated by the plan. The licensee shall allow a minimum of 30 days for the consulted parties to comment before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. No land-disturbing activities shall begin at the Holyoke Project until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the CRLMP, including any changes required by the Commission.

Recreation Plan

The licensee shall prepare the Recreation Plan after consulting with the parties specified above. The Recreation Plan shall include, but not be limited to, the following:

The recreation component of the plan should address, at a minimum: (1) future recreation needs at the project for the term of the license; (2) alternative uses for Cove Island; (3) administering recreational use, including strategies for minimizing conflicts among users; (4) facility development, including improving the Robert E. Barrett Fishway, three composting toilets, a trail along the South Hadley Canal, and a trail in South Hadley at the riverside park site (according to design by Berkshire Design Group, letter by Ronald A. Kreisman, Counsel for the Town of South Hadley, Hallowell, Maine, January 2, 1999); (5) operation and maintenance of the recreational facilities; (6) site plans; (7) participating in the channel marking program by funding, at a minimum, \$5,000 per year, adjusted annually for inflation; (8) recreational carrying capacity of the impoundment; (9) improved boat facilities at existing public facilities; (10) adequate provisions to ensure facilities and programs, including improved access for bank anglers, are accessible for people with disabilities; (11) disposition and use of the Texon Mill complex; (12) hiking and walking trails; (13) camping facilities; (14) coordinating management of the Dinosaur Footprints Reservation with adjacent Holyoke Power-owned property; (15) information facilities (e.g. signage, brochures) for resource interpretation and education; (16) portage access around the dam; (17) continue sponsoring the annual shad derby and consider substituting or adding a recreational striped bass derby; (18) providing adequate advance warning to the public regarding major water level fluctuations and significant releases downstream from the project dam; (19) resource protection; (20) a plan and schedule for periodically assessing recreational use and needs and its effects on sensitive wildlife habitat areas in the Holyoke impoundment and project area, including a provision to revise the plan if needed; and (21) include estimated cost and the staff necessary to develop and implement the monitoring program.

The license shall include with the recreation plan a construction schedule, the entity responsible for operation and maintenance of the facilities, costs for the construction and yearly maintenance of each facility, and a discussion of how the recreational facilities are visually compatible with the project area. The plan shall be prepared in conjunction with the Land Management Plan, and the Buffer Zone Management Plan.

Land Management Plan

The licensee shall prepare the Land Management Plan after consulting with the parties specified above. The Land Management

Plan shall include, but not be limited to, the following: (1) conservation easements on, or restricted use of, the Bachelor Brook/Stony Brook natural area, Log Pond Cove, Rainbow Beach, Cove Island, Connecticut River Water Trail sites in Sunderland, Red Rock complex, Hadley Cove and Sandy Beach area, and Hockonum Flats; (2) strategies for maintaining open space, public access, preserving wildlife habitat on lands currently around the Holyoke impoundment, and as appropriate, implementing best management practices on private land around the impoundment.

The licensee shall include with the land management plan an implementation schedule and the cost of implementing the plan. The plan shall be prepared in conjunction with the Recreation Plan, and the Buffer Zone Management Plan.

Buffer Zone Management Plan

The licensee shall prepare the Buffer Zone Management Plan after consulting with the parties specified above. The Buffer Zone Management Plan shall include, but not be limited to, the following: (1) provisions that specify allowable uses within the buffer zone and standards and guidelines for the allowable uses; (2) maps delineating the shore land protective buffer zone area; (3) the criteria used for selecting the buffer zone widths, and provisions to: (a) maintain a prescribed minimum-width for a no tree-cutting zone around the project impoundments, and (b) carefully plan any vegetation clearing activities adjacent to the buffer zone, including any special consideration to the scale and pattern of any areas where cutting is performed; (4) measures to ensure that maintenance of project transmission lines rights-of-ways near the shoreline areas is performed in a way that minimizes adverse aesthetic effects caused by the maintenance of vegetation; (5) measures to screen or soften by supplemental landscape plantings in areas where facilities, and other negative visual features are visible from the shoreline, impoundment, or other adjacent critical viewpoints. This screening work should be implemented as needed. Further, the licensee should conduct a periodic inspection of project lands to identify any features in need of screening or general clean-up, and subsequently take remedial action, and monitor the shorelines for unauthorized activity. In addition, the plan shall: (1) address measures for long term conservation of the riparian areas; (2) specify allowable uses within the riparian areas and how conflicts among uses are to be minimized; (3) specify where access to project waters will be provided for recreational purposes; and (4) propose specifically how the plan is to be implemented.

The licensee shall include with the buffer zone management plan an implementation schedule and the cost of implementing the plan. The plan shall be prepared in conjunction with the Recreation Plan and the Land Management Plan, and address the items listed in Condition Number 28 (Riparian Management Plan) of

the Section 401 water quality certification attached as part of this license.

Article 419. At least 90 days prior to installation of the inflatable rubber dam required by Article 401, the licensee shall file, for Commission approval, a plan that outlines measures to minimize the effects on recreational boaters caused by installing the rubber dam. The plan shall, at a minimum, specify measures such as minimizing the amount of drawdown, signing, increased use of buoys, and erosion control methods to implement, if necessary, during the installation period. The filing shall include a schedule to install the inflatable rubber dam.

The licensee shall prepare the plan and schedule after consultation with the Connecticut River Channel Marking Committee, Massachusetts Division of Fisheries and Wildlife, Massachusetts Department of Environmental Management, Connecticut River Greenway State Park, and local marinas. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the plan and schedule after they have been prepared and provided to the consulted parties, and specific descriptions of how the parties' comments are accommodated by the licensee's facilities. The licensee shall allow a minimum of 30 days for the consulted parties to comment and to make recommendations before filing the plan and schedule with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the proposed plan and schedule. Installation of the inflatable rubber dam shall not begin until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 420. The licensee shall implement the "Programmatic Agreement Among The Federal Energy Regulatory Commission, the Advisory Council on Historic Preservation, and the State of Massachusetts, State Historic Preservation Officer, for Managing Historic Properties that may be Affected by a License Issuing to Either Holyoke Waterpower Company, or to the Consortium Consisting of the City of Holyoke Gas & Electric Department, Massachusetts Municipal Wholesale Electric Company, and Ashburnham Municipal Light Plant for the Continued Operation And Maintenance of the Holyoke Hydroelectric Project in Massachusetts", executed on July 27, 1999. In the event that the Programmatic Agreement is terminated, the licensee shall implement the provisions of its approved Cultural Resources Management Plan. The Commission reserves the authority to require changes to the Cultural Resources Management Plan at any time during the term of the license. If the Programmatic

Agreement is terminated prior to Commission approval of the Cultural Resources Management Plan, the licensee shall obtain Commission approval before engaging in any ground disturbing activities or taking any other action that may affect any historic properties within the project's area of potential effect.

Article 421. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of

vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed. If no conveyance was made during the prior calendar year, the licensee shall so inform the Commission and the Regional Director in writing no later than January 31 of each year.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources

of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

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

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

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

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

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

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

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(H) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters relating to that filing. Proof of service on these entities must accompany the filing with the Commission.

(I) This order is final unless a request for rehearing is filed within 30 days from the date of its issuance, as provided in Section 313(a) of the FPA. The filing of a request for rehearing does not operate as a stay of the effective date of this license or of any other date specified in this order, except as specifically ordered by the Commission. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

By the Commission. Commissioner Bailey dissented in part with a separate statement attached.

(S E A L)

Linwood A. Watson, Jr.,
Acting Secretary.

APPENDIX A -- Water Quality Certification Conditions

COMPLIANCE

1. The project shall be operated in accordance with the conditions contained in this certification and the provisions included in the FERC applications (#11607-000) and (#2004-073) and any modifications made thereto, to the extent such

application provisions and modifications are consistent with this water quality certification. The operation of the hydrofacility shall be operated to maintain the designated uses of the Connecticut River as outlined in the Massachusetts Surface Water Quality Standards (314 CMR 4.00) and the maintenance of an integrated and diverse biological community in the Connecticut River.

2. All activities shall be conducted in compliance with the Massachusetts Wetlands Protection Act (including the Rivers Protection Act) (MGL Chapter 131, Section 40). An application for a Water Quality Certification shall be submitted and approved by the MADEP prior to any activity that will cause a discharge subject to Section 404. The licensee will be expected to develop and implement a plan to monitor and control erosion as needed to keep waters free from turbidity in concentrations that are aesthetically objectionable or would impair any use assigned to these waters.

3. The applicant shall comply with Massachusetts General Laws Chapter 91.

4. All maintenance and repair activities, including disposal of debris and removal of sediments in impounded areas, shall be conducted in a manner so as not to impair water quality.

5. Any change to the project that would have a significant or material effect on the findings, conclusions, or conditions of this certification, including project operation, must be submitted to the MADEP for prior review and written approval where appropriate and authorized by law and only as related to the change proposed.

6. The MADEP may request, at any time during which this certification is in effect, that the FERC reopen the license to make modifications necessary to maintain compliance with the Massachusetts Surface Water Quality Standards or other appropriate requirements of state law.

7. The MADEP reserves the right to add and alter the terms and conditions of this certification when authorized by law and as appropriate to carry out its responsibilities during the life of the project with respect to water quality.

8. A copy of this certification shall be prominently posted within the project powerhouse.

RUN-OF-RIVER

9. Upon license issuance, the project shall be operated in an instantaneous run-of-river mode, which will result in the stabilization of the impoundment to within 0.2 feet of the normal

pond elevation. This operation regime may be modified due to operating emergencies beyond the control of the Project Owner (e.g. extreme runoff events, droughts, ice conditions, equipment failure or flood storage requirements) that may result in conditions making the operational restrictions and requirements contained herein impossible to achieve or are inconsistent with the prudent and safe operation of the project. Under such extreme conditions operation at variance with the commitments contained in this Water Quality Certification shall not be deemed to violate this Water Quality Certification. This condition shall not be interpreted as providing the Project Owner broader authorization to operate at variance with the requirements provided herein than is provided for in the FERC license. The Project Owner shall notify the MADEP, the Massachusetts Division of Fisheries and Wildlife (MADFW) and the US Fish and Wildlife Service (USFWS) within 5 working days of such an emergency event and shall prepare and provide a report of each incident, identifying the variances from normal operations that occurred, and identifying ways of avoiding future occurrences, if applicable. The report shall be submitted no later than 45 days after the emergency condition ends.

10. Within one year of license issuance, the licensee shall consult with the MADFW and the USFWS and present to the MADEP for approval a run-of-river operation and monitoring plan and implementation schedule. The plan shall describe the methods used to monitor headpond and river flows to adjust project operations to maintain run-of-river conditions both before and after rubber dam installation. The plan shall also describe how project operation records would be maintained and made available to the FERC and resource agencies to verify compliance with run-of-river operations.

RUBBER DAM

11. Within one year of license issuance, the licensee shall submit to the MADEP for approval a plan to replace the existing wooden flashboards along the crest of the dam with an inflatable rubber fabric dam system based upon consultation with the MADFW, the USFWS, the MADEM and the MADEP. The plan should include at a minimum (1) the designs and installation schedule, (2) procedures for installing the rubber dam, including measures to minimize effects on impoundment boaters during the period of installation, and (3) appropriate erosion and sedimentation controls. The minimum bypass reach flow shall remain 840 cfs and zone of passage flow shall remain 1300 cfs during construction unless it can be demonstrated to the MADFW, the USFWS and the MADEP this action is impossible to achieve or is inconsistent with the safe and prudent operation of the project. The licensee shall implement the plan as approved by the MADEP.

BYPASS REACH FLOWS

12. Upon license issuance, from July 15 through September 15, and between November 15 and April 1, and for any other periods of time when fish passage facilities are not in operation and flows provided for establishing a zone-of-passage are not needed, maintain a continuous minimum flow of 840 cfs in the bypass reach. If, in the future, fish passage operations are modified to include these specified times, these habitat-based flows shall be superseded by zone-of-passage flows. This operation regime may be modified due to operating emergencies beyond the control of the Project Owner (e.g. extreme runoff events, droughts, ice conditions, equipment failure or flood storage requirements) that may result in conditions making the operational restrictions and requirements contained herein impossible to achieve or are inconsistent with the prudent and safe operation of the project. Under such extreme conditions operation at variance with the commitments contained in this Water Quality Certification shall not be deemed to violate this Water Quality Certification. This condition shall not be interpreted as providing the Project Owner broader authorization to operate at variance with the requirements provided herein than is provided for in the FERC license. The Project Owner shall notify the MADEP, MADFW, and the USFWS within 5 working days of such an emergency event and shall prepare and provide a report of each incident, identifying the variances from normal operations that occurred, and identifying ways of avoiding future occurrences, if applicable. The report shall be submitted no later than 45 days after the emergency condition ends. This operating regime may also be modified during any construction activities that, as demonstrated to the satisfaction of the MADEP, make it impossible to achieve the restrictions and requirements contained herein or are inconsistent with the prudent and safe operation of the project.

13. Upon license issuance, the licensee shall release 1,300 cfs into the bypass reach from April 1 through July 15 and September 15 through November 15, as zone of passage flows for salmon and shad.

14. Within one year of license issuance, the licensee shall consult with the MADFW, the USFWS, the MADEP and the National Marine Fisheries Service (NMFS) and submit to the MADEP a plan to redistribute flow to the three channels in the bypass reach. The licensee shall implement the plan during the construction season following installation of the rubber dam as approved by the MADEP. Upon completion of channel modifications, the licensee shall provide a continuous minimum flow of 600 cfs to the East Channel, 100 cfs to the Center Channel and 140 cfs to the West Channel. This operation regime may be modified due to operating emergencies beyond the control of the Project Owner (e.g. extreme runoff events, droughts, ice conditions, equipment failure or flood storage requirements) that may result in conditions making the operational restrictions and requirements contained herein

impossible to achieve or are inconsistent with the prudent and safe operation of the project. Under such extreme conditions operation at variance with the commitments contained in this Water Quality Certification shall not be deemed to violate this Water Quality Certification. This condition shall not be interpreted as providing the Project Owner broader authorization to operate at variance with the requirements provided herein than is provided for in the FERC license. The Project Owner shall notify the MADEP, MADFW, and the USFWS within 5 working days of such an emergency event and shall prepare and provide a report of each incident, identifying the variances from normal operations that occurred, and identifying ways of avoiding future occurrences, if applicable. The report shall be submitted within 45 days after the emergency condition ends.

15. Within eighteen months of license issuance, the licensee shall consult with the MADFW and the USFWS and submit to the MADEP a plan for gauging bypass reach flows. The plan should address gauging channel specific flows once in order to calibrate flow distribution, and total flow after both rubber dam installation and channel modifications are completed. The licensee shall implement the plan as approved by the MADEP within one year after rubber dam installation and channel modifications are complete.

PROJECT FLOWS

16. Upon license issuance, the licensee shall operate the project using the following flow distribution regime during the Atlantic salmon smolt downstream migratory period (April 1 - July 15). Periodic review of this regime will be conducted with the license holder and the MADFW, the USFWS and the NMFS to determine effectiveness.

1. Flows sufficient to operate fish passage facilities
2. Zone of passage flows (1,300 cfs)
3. Canal minimum flow (810 cfs)
4. Hadley Falls Station to Unit One capacity (4,200 cfs)
5. Canal operations to canal capacity
6. Hadley Falls Station to capacity (if after a new full-depth screen is in place, and an evaluation shows that the new bypass there is efficient, Hadley Falls Unit 2 could be operated to capacity before the canal).

17. Within six months of license issuance, the licensee shall consult with the MADFW and the USFWS and submit to the MADEP a low flow contingency plan for allocating available flow throughout the project outside of the fish passage season. The licensee shall implement the plan as approved by the MADEP. See condition #16.

CANAL OPERATIONS

18. Upon license issuance, the licensee shall implement an interim canal-operating regime whereby flows up to 810 cfs from April 1 through November 15 and 400 cfs from November 16 through March 31 are discharged through various canal segments in accordance with the flow distribution regime described in condition #16.

19. Within three months of license issuance, the licensee shall consult with the MADFW and the USFWS and submit to the MADEP a plan to provide permanent continuous flows through the canal system. The licensee shall implement the plan as approved by the MADEP.

20. Within three months of license issuance, the licensee shall consult with the MADFW and the USFWS and submit to the MADEP a plan for protecting aquatic resources during canal drawdowns. The licensee shall implement the plan as approved by the MADEP.

21. Within one year of license issuance, the licensee shall consult with the MADFW and the USFWS and submit to the MADEP a 5-year plan for monitoring mussel populations in the canal system. The licensee shall implement the plan as approved by the MADEP. Results of the monitoring shall be submitted to the resource agencies for review. The five-year report shall identify the changes in the mussel populations over time, proposals for changes in canal operations or structures, if any, to protect mussel populations and/or the need for continued monitoring.

FISHWAYS

22. Upon license issuance, the licensee shall:

(a) Consult with the MADFW, the USFWS, the Connecticut River Atlantic Salmon Commission (CRASC) and the NMFS regarding how to improve the fishlift facilities and submit to the MADEP an implementation schedule. The licensee shall implement the improvements as approved by the MADEP. The implementation schedule shall include one year for submission to the MADEP of final design drawings and an additional year to begin construction. The licensee shall ensure lifting operations are possible up to the stated design capacity of 40,000 cfs river flow. Improvements shall include widening the existing exit flume from 7 feet to 14 feet to the counting station and to 10 feet from the counting station to the exit, increasing the capacity of the spillway lift hopper to 460 cubic feet and the tailrace hopper to 330 cubic feet, widening the gated spillway entrance and channel to 8 feet and providing fishway entrance attraction flows of 200 cfs at the spillway entrance and 120 cfs at each of the tailrace collection gallery entrances. Within one year after completion of installation, the licensee shall submit to the MADEP a study of the facility effectiveness. The licensee shall implement any changes as approved by the MADEP.

As an alternative to improving the existing fishlift, the licensee may, within one year of license issuance notify the MADEP that the licensee would prefer to construct a new fishlift, compatible with but separate from any new generation (such as the new third turbine proposed by HGE), with capabilities at least as effective as the improved fishlift and with the same implementation schedule, consultation and approval process.

(b) operate upstream passage facilities whenever feasible beginning on or about March 15 to accommodate white sucker passage. The facilities should operate April 1 through July 15 to accommodate herring, shad and salmon as well as white sucker passage. The upstream facilities should operate September 15 through November 15 to accommodate fall salmon passage. Hours of operation will be set by the resource agencies, not by the license holder.

23. Within six months of license issuance, the licensee shall:

(a) submit to the MADEP a design for a second salmon trapping device in the fishway exit flume that has operating capabilities at least as effective as the device depicted in HGE's Application for New License, Volume 1, Section 3.1.7.2.3 after consultation with the MADFW, the USFWS and the CRASC. The licensee shall implement the design as approved by the MADEP. The design shall include an implementation schedule for installation and be incorporated into the improvements of the existing fishlift or into the new fishlift.

(b) submit to the MADEP a scope of work and implementation schedule for a feasibility study to determine the best design for a new entrance to the tailrace lift downstream and outside the influence of the boil from the turbine discharge after consultation with the MADFW, the USFWS, the Connecticut River Atlantic Salmon Commission and the NMFS. The licensee shall implement the design as approved by the MADEP. The design shall provide unimpeded, full depth access to the new entrance and an implementation schedule for installation.

In addition, ledge excavation is required on the west wall of the tailrace in the area immediately downstream of the existing (but non-functional) tailrace entrance to allow operation of this existing entrance. This construction need shall be addressed in the scope of work and implementation schedule mentioned above. The licensee shall implement the construction as approved by the MADEP. Within one year after installation, a study of the effectiveness of both entrances will be conducted.

(c) consult with the MADFW and submit to the MADEP a scope of work and implementation schedule to conduct all fishway operations. The licensee shall implement the scope of work as approved by the MADEP. The scope of work shall specify that all

operations necessary for safe, timely and efficient fish passage (including but not limited to counting, trapping, monitoring and collection of biological data) will be under the direction of the MADFW and paid for by the licensee. The licensee can conduct operations using their own resources or subcontract. The licensee shall not bear the cost to transport fish to a watershed other than the Connecticut River.

(d) consult with the MADFW and submit to the MADEP a plan and schedule for implementation to monitor upstream resident fish passage through the project. The licensee shall implement the plan as approved by the MADEP. The licensee shall prepare a report and a schedule for implementation that identifies any changes to fishway operations or structures necessary to protect and enhance the passage of resident fish within six months after submitting the monitoring results to MADFW.

24. Within one year of license issuance, the licensee shall:

(a) consult with the MADFW, the USFWS and the CRASC and submit to the MADEP final designs for a new fish trapping and hauling system that has operating capabilities at least as effective as the device depicted in Figure 6-4 of HGE's December 23, 1998 filing. The licensee shall implement the design as approved by the MADEP. The design shall include an implementation schedule for installation and be incorporated into the improvements of the existing fishlift or into the new fishlift. Within one year after installation, the licensee shall conduct and submit to the MADEP a study of the effectiveness of the facility.

(b) consult with the MADEP, the MADFW, the USFWS and the NMFS and submit to the MADEP a final design to construct a conveyance, which will intercept downstream migrating anadromous fish at the bascule gate on the Holyoke Dam and transport them to the Hadley Falls Station tailrace. The licensee shall implement the construction as approved by the MADEP. The final design shall have operating capabilities at least as effective as presented in HWP's Response to Additional Information Requests, July 1998, Figure 5.B. Within one year after installation, a study of the effectiveness of the facility will be conducted. If the licensee decides to build a new fishlift rather than improve the existing fishlift, the conveyance will be constructed within two years of license issuance, in order for schedules to be compatible.

(c) consult with the MADFW, the USFWS and the NMFS submit to the MADEP a final design and implementation schedule to construct a barrier to migrating fish across the Number 2 overflow raceway with operating capabilities at least as effective as depicted in HGE's Schedule B, Additional Information, Volume II, July 1998, section B-2, figure 11-B-1. The licensee shall implement the design as approved by the MADEP. Within one year after

installation, the licensee shall conduct and submit to the MADEP a study of the effectiveness of the facility.

(d) consult with MADFW, the USFWS and the NMFS and submit to the MADEP a final plan for American eel ladders on both spillway and tailrace sides of the dam at least as effective as depicted in HGE's Response to Additional Information Requests, Schedule B, Item 6, figures 6-A-1, 6-A-2, July 1998 and a schedule for their installation. The licensee shall implement the plan as approved by the MADEP. Within one year after installation, the licensee shall conduct and submit to the MADEP a study of the effectiveness of the facility.

25. Consult with MADFW, the USFWS, the CRASC and the NMFS and submit to the MADEP an American eel downstream passage plan and a schedule for its implementation. The licensee shall implement the plan as approved by the MADEP. Within one year after installation, the licensee shall conduct and submit to the MADEP a study of the effectiveness of the measures taken.

26. Within one year after the NMFS (in accordance with the Endangered Species Act) develops its final recommendations, submit to the MADEP a plan to meet sturgeon upstream and downstream passage need, timing and measures and a schedule for implementation in consultation with MADFW, the USFWS and the NMFS. The licensee shall implement the plan as approved by the MADEP. Within one year after installation, the licensee shall conduct and submit to the MADEP a study of the effectiveness of the measures taken. Potential effects from the NMFS recommendations could include but not be limited to: (a) changes in zone of passage timing, (b) changes in zone of passage minimum flows, (c) changes in minimum flows in the bypass reach, and (d) additional downstream facilities.

27. Unless and until otherwise ordered by the MADEP, the licensee shall continue to operate the Boatlock Station downstream bypass facility.

RIPARIAN MANAGEMENT PLAN

28. Within one year of license issuance, the licensee shall submit to the MADEP a riparian management plan to protect water quality and designated uses including fishery and wildlife habitat, and primary and secondary contact recreation, from adverse impacts and degradation resulting from development and use as a result of the Project. The plan shall encompass all riparian land at a minimum within 200 feet of the Connecticut River around and above the Holyoke Dam (extending horizontally from 0.2 feet above the normal pond elevation) on property owned by HWP as of July 28, 1999. The plan shall (a) specify how a riparian zone adequate to protect water quality and designated uses will be established around the perimeter of the Project

pond, specifically addressing how long term conservation of important riparian areas can be assured as needed to achieve this objective, (b) specify allowable uses within the proposed riparian zone, and how conflicts among uses are to be minimized to protect water quality, fisheries, wildlife, and recreational values of the river and its riparian land, (c) specify how and where the licensee will appropriately provide access to project waters for swimming, boating and fishing in a way that is compatible with other designated uses and values, and (d) propose specifically how the plan is to be implemented. The plan shall be developed in consultation with the MADFW, the MADEM, the USFWS, the City of Holyoke, the Town of South Hadley, the Connecticut River Watershed Council and other interested organizations. The licensee shall implement the plan as approved by the MADEP on the project property owned by HWP as of July 28, 1999. The riparian zone shall be sufficient to:

(1) serve as a vegetative filter to substantially reduce nonpoint source discharges of oil and grease, sediment, nutrients and fertilizers, pesticides, and other contaminants that may be transported to project waters in overland runoff from existing or potential adjacent residential, commercial or agricultural uses or roads;

(2) protect near shore fish, aquatic life and wildlife habitat from degradation resulting from adjacent uses and disturbances and from alterations to the shoreline including docks, riprap, and other structural modifications;

(3) include significant wildlife habitats and buffers adequate to avoid disturbance from adjacent uses, for species utilizing project waters and associated wetlands, including but not limited to rare, threatened, or endangered wildlife species, or other state or federally listed species of concern; and

(4) protect riparian habitat areas and buffers for species which use the riparian area in conjunction with project waters, e.g. turtle nesting areas, and bald eagle perch trees used for feeding;

(5) include riparian areas of significant recreational value as points of public access to project waters for primary and secondary contact recreation.

Within 30 days of the MADEP approval, the final plan shall be recorded for each parcel owned by HWP within the riparian zone, as of July 28, 1999, at the applicable registry of deeds by the licensee.

ADDITIONAL PLANS

29. Within one year of license issuance, the licensee shall:

(a) submit to the MADEP a plan to monitor and help control and eliminate invasive species (including but not limited to zebra mussel and water chestnut) within the project boundary in consultation with the MADEP, the MADFW, the USFWS, the MADEM and the Silvio O. Conte National Fish and Wildlife Refuge; the licensee shall implement the plan as approved by the MADEP. The plan should include identifying appropriate remedial measures to control such species.

(b) submit to the MADEP a management plan and a schedule for implementation to protect, enhance and manage animals and plants that are listed as protected under the MA Endangered Species Act within the project boundary in consultation with the MADFW, the USFWS, the MADEM, the Silvio O. Conte National Fish and Wildlife Refuge and the MADEP. The licensee shall implement the management plan as approved by the MADEP. The plan shall incorporate safeguards to avoid conflicts between recreational users and protection of populations of rare and endangered species and specify how lands within the project boundary will be managed to protect natural resources.

30. Within eighteen months of license issuance, the licensee shall submit to the MADEP a water quality monitoring plan in consultation with the MADEP and the MADFW. The licensee shall implement the plan as approved by the MADEP. The plan shall include testing at the intake, below the Bascule gate (until turbine construction), the tailrace, the bypass reach, Cove Island and in the Holyoke canals for parameters such as dissolved oxygen, dissolved nitrogen, temperature and fecal coliform bacteria. If violations of 314 CMR 4.00 are noted, operational changes that may include but not be limited to increased flow in the bypass reach may be necessary.

THIRD TURBINE CONSTRUCTION

If the licensee builds a new generation unit (such as the third turbine as proposed by HGE) the following conditions shall apply. The licensee shall:

31. Consult with the MADFW and the USFWS to provide safe and effective fish passage upstream and downstream during construction of the new generating unit. The licensee shall implement as approved by the MADEP. The existing spillway should be used with operating capabilities at least as effective as presented in HGE's Schedule B, Additional Information, Section 6(B), Scheme A (Figure 6-1), December 23, 1998. The minimum bypass reach flow shall remain 840 cfs and zone of passage flow shall remain 1300 cfs during construction unless it can be demonstrated to the MADFW, the USFWS and the MADEP this action is impossible to achieve or is inconsistent with the safe and prudent operation of the project. See condition #12.

32. Consult with the MADFW, the USFWS, the CRASC and the NMFS during third unit construction and submit to the MADEP a final plan for a new tailrace fish lift with operating capabilities at least as effective as depicted in HGE's Application For New License, Volume 1, Section 3.1.7.2.1 and a schedule for its installation. The licensee shall implement the plan as approved by the MADEP. Within one year after installation, the licensee shall conduct a study of the effectiveness of the facility.

33. Consult with the MADFW, the USFWS, the CRASC and the NMFS during third unit construction and submit to the MADEP a final plan for a new spillway lift with operating capabilities at least as effective as depicted in HGE's Application For New License, Volume 1, Section 3.1.7.2.2 and a schedule for its installation. The licensee shall implement the plan as approved by the MADEP. Within one year after installation, the licensee shall conduct a study of the effectiveness of the facility.

34. Consult with the MADFW, the USFWS, the CRASC and the NMFS during third unit construction and submit to the MADEP a final plan for a new trash rack/fish screen, fish bypass, and fish sampling facility in the Hadley Falls Station forebay with operating capabilities at least as effective as depicted in HGE's Application For New License, Volume 1, Exhibit A, Section 3.1.7.1 and a schedule for its installation. The licensee shall implement the plan as approved by the MADEP. Within one year after installation, the licensee shall conduct a study of the effectiveness of the facility.

35. Construction of a new generating unit such as the third generating wheel proposed by HGE shall not begin in the river any year before July 15.

36. Procure a construction dewatering permit from the MADEP and the United States Environmental Protection Agency prior to cofferdam dewatering.

37. Within one year prior to construction, consult with the MADEP to determine if an approved plan is needed to detect and control any contaminants that could violate water quality standards from the Holyoke Gas Works hazardous waste site.

SIGNED:

____\s_____

7/28/99_____

Arleen O'Donnell
Assistant Commissioner
Bureau of Resource Protection
Department of Environmental Protection

Date

APPENDIX B

SUMMARY OF HOLYOKE ECONOMICS (SOURCE: COMMISSION STAFF)

Description	HWP No Action	HWP Proposed Action	HWP Proposed Action with Staff Additional Measures ⁹⁴	HWP License Order ⁹⁵
Total Annual Gross Benefits	\$8,816,000	\$8,557,000	\$7,798,000	\$7,855,000
Annual Generation	223,500 MWH	211,300 MWH	198,325 MWH	193,956 MWH
Unit Gross (\$/MWH)	39.46	40.5	39.32	40.5
Total Annual Generation Costs	\$7,823,000	\$8,607,000	\$8,752,000	\$9,092,000
Unit Cost (\$/MWH)	35.02	40.72	44.13	46.88
Net Annual Benefits	Positive \$993,000	Negative \$50,000	Negative \$954,000	Negative \$1,237,000
Unit Net (\$/MWH)	4.45	-0.24	-4.81	-6.38

^{94/} Does not include mandatory conditions, unless recommended by Commission staff. See Table 5-2 of Final EIS.

^{95/} These costs are inclusive of mandatory conditions (*i.e.*, FPA Section 18 and CWA Section 401 conditions) and staff recommended conditions.

Holyoke Water Power Company)	Docket No. 2004-073
Holyoke Gas & Electric)	Docket No. 11607-000
Department, Ashburnham)	
Municipal Light Plant, and)	
Massachusetts Municipal)	
Wholesale Electric Company)	

(Issued August 20, 1999)

BAILEY, Commissioner, dissenting in part

I write separately to express my concern with the aggregate impact of the license terms and conditions adopted in today's order. I am uncomfortable with an order that, on the one hand, awards Holyoke Power the right to continue operating the Holyoke Project over the objection and competing application of Municipalities, while loading the license up with terms and conditions that, collectively, may make the Project uneconomic to operate and may motivate Holyoke Power to repudiate its hard-fought victory. Moreover, I am uncomfortable with the order's recognition that had Municipalities proved successful in their contest with Holyoke Power to win the license to operate the Project, they would have been saddled with license terms and conditions that would have made their success an even more costly one.

I start with Part I of the Federal Power Act. The Commission has the statutory mandate, when establishing license conditions, to balance power and other developmental interests together with consideration of non-power values, such as the protection of fish and wildlife resources and the provision of recreation and flood control. On several recent occasions, I have expressed my concern that the Commission places little value on the market aspects of this balancing mandate. See City of Tacoma, Washington, 84 FERC ¶ 61,107 at 61,602-03 (1998), order on reh'g, 86 FERC ¶ 61,311 at 62,106-11 (1999) (dissents); Edwards Manufacturing Company, 81 FERC ¶ 61,255 at 62,211-12 (1997) (dissent).

My concern is that environmental mitigation and enhancement measures increasingly are being adopted with little regard for evidence that such conditions might seriously impair the economic operation of the hydroelectric project. While such decisions may have been acceptable prior to the introduction of competition, when hydroelectric utilities may have been able to pass these costs through to ratepayers, that is no longer a prudent operating assumption. These utilities cannot afford to increase

their exposure to stranded costs as a result of high-cost generation resources, and thus cannot cavalierly accept licenses to continue operating projects that will raise the cost of

-2-

producing power sometimes several million dollars per year above competitive market rates. The same agency that has done so much to unleash the competitive forces shaping the electric industry today cannot ignore this reality.

Today's order implicates this same concern. The order candidly acknowledges the economic implications to Holyoke Power of the Commission's decision to award it -- rather than Municipalities -- the license to continue operation of the Project. Under the new license's terms and conditions (both mandatory and permissive), Holyoke Power will generate less power (a reduction of 29,500 MWh annually) than under current conditions. Without adjusting for inflation, the price of power generated by the Project will increase to \$46.88 per MWh, as compared to a unit cost of \$35.02 per MWh under current conditions. And the net annual benefits to Holyoke Power from continued operation of the Project will decline precipitously from positive \$993,000 annually under current conditions to negative \$1.24 million annually (because the unit cost of Project-generated hydropower will exceed the price that Holyoke Power will be able to sell the same power, or purchase an equivalent amount from an alternative source, by over \$6 per MWh).⁹⁶

I recognize that many of the terms and conditions imposed on the license awarded to Holyoke Power, and the economic implications of those terms and conditions, are the product of recommendations of federal and state resource agencies that the Commission lacks authority to reject. Indeed, the order notes in several places that the Commission is reluctantly adopting certain mandatory license terms and conditions that it believes are not justified in light of the minimal benefits produced and the substantial costs incurred. And in certain other places, where the Commission does have the authority, the Commission

^{96/} As proposed by Holyoke Power in its relicensing application, annual generation would decline by only 12,200 MWh, and the unit cost of hydropower generated by the Project would rise to only \$40.72 per MWh. In addition, Holyoke Power had contemplated negative net benefits of only \$50,000 per year. All of these numbers are subject to correction, as today's order indicates that additional or revised terms and conditions may be necessary to reflect ongoing consultations with federal agencies on the subject of threatened and endangered species.

affirmatively intercedes to reject proposed license conditions that are not justified in light of the cost of compliance.

I am gratified that the Commission recognizes the balancing of economic and non-economic interests required under Part I of

-3-

the FPA, and has acted to ensure that the license awarded to Holyoke Power is not even more of a monetary sinkhole. At this time, however, I remain unconvinced that the Commission has been aggressive in slashing costs and in adopting only those license terms and conditions that are truly justified when their presumed benefits are balanced against the cost of compliance. Lacking the ability myself to quantify the economic impact of each of the license's terms and conditions and to balance that impact against the value of compliance, I invite the licensee to undertake this task on rehearing if so motivated.

In the present circumstances, Holyoke Power justifiably may lack the motivation to embrace its victory and to accept a new license that may strain the ability of its parent company, Northeast Utilities, to provide reliable and competitively-priced electric service. Today's order, while recognizing the economic implications of the license terms and conditions it adopts, affords Holyoke Power essentially a take-it-or-leave-it option: "Holyoke Power must make the business decision whether to accept this license under these terms and conditions."

If Holyoke Power makes the business decision to disavow the license, will there be anyone else to accept it? I have my doubts, in light of the order's recognition of the terms and conditions the Commission would have imposed on Municipalities if they had proved victorious in wresting the license away from Holyoke Power. While the negative net benefits to be assumed by Holyoke Power are estimated to be negative \$1.24 million per year, the negative net benefits that would have been assumed by Municipalities, with license measures recommended by Commission staff, would have been much worse -- negative \$2.8 million per year! (The order attributes much of the difference to the expansion of the Project proposed by Municipalities.)

In light of the economic implications of the terms and conditions that would have been imposed on either of the applicants in this proceeding, the Commission, in deciding upon which application to choose, is left to choose from among two applications that are deemed not to be "cost effective." As there is no significant distinction between the two applications in all other respects, the Commission today chooses Holyoke Power's application because the net annual economic benefit of

Holyoke Power's proposal is deemed to be "less negative" (by almost 200 percent) than that of Municipalities.⁹⁷

-4-

A negative net benefit of several million dollars per year, or any negative net benefit at all for that matter, is certainly not what Municipalities had in mind when they filed to compete against Holyoke Power for the right to operate the Holyoke Project. The intention underlying Municipalities' application was to use surplus project revenues to lower electricity rates, revitalize local communities, and fund various recreational and enhancement measures. In the absence of any project surpluses, Municipalities may no longer have the incentive to operate the Project even if it were presented with the opportunity to do so.

As a result, today's order may leave no licensee for the Holyoke Project, and may thus deprive the region of the benefits that the order recognizes flow from continued operation of the Project. Other utilities may now be hesitant to seek to relicense other existing hydroelectric projects or to assume their operation. My preference would be for the Commission to encourage more competition of the type leading to today's order - what I understand is the first time the Commission has been presented with competing applications at the relicensing stage -- rather than less.

Vicky A. Bailey
Commissioner

^{97/} While I do not share the majority's assessment of the "cost effectiveness" of the respective licensing plans, I have no objection to the decision to award the license to Holyoke Power. As the order suggests, a tie would have been broken in favor of the incumbent licensee in light of the language of section 15(a)(2) of the FPA ("insignificant differences . . . shall not result in the transfer of a project") and Holyoke Power's "excellent" 50-year record of compliance with respect to the Holyoke Project.

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Holyoke Water Power Company
City of Holyoke Gas & Electric Department

Project No. 2004-104

ORDER APPROVING TRANSFER OF LICENSE

(Issued September 20, 2001)

On July 17, 2001, Holyoke Water Power Company (HWP or transferor) and the City of Holyoke Gas & Electric Department (HG&E or transferee) jointly filed an application for approval to transfer the license for the Holyoke Hydroelectric Project No. 2004 from HWP to HG&E. The Holyoke Project is located on the Connecticut River in Hampden County, Massachusetts. As discussed below, the application will be granted.

BACKGROUND

On September 2, 1997, HWP, the incumbent licensee for Project No. 2004, filed an application for a new license for the project. A competing license application was jointly filed by HG&E, Ashburnham Municipal Light Plant, and the Massachusetts Municipal Wholesale Electric Company (collectively, the competing applicants). On August 20, 1999, the Commission issued an order granting a new license to HWP and denying the competing application.¹ The August 20 order is pending on rehearing.²

The license transfer is being sought in connection with the proposed sale of the project to HG&E as part of a Settlement Agreement dated June 7, 2001,³ between HWP and HG&E. The Settlement Agreement is designed to resolve litigation between HWP and HG&E (pending since the mid-1990's) concerning HG&E's authority to serve certain customers, as well as issues regarding relicensing competition for the project. Pursuant to Section 5.2(d) of the Settlement Agreement, on July 27, 2001, the transferee filed contingent withdrawals for itself and its joint competing applicants of their application and rehearing requests in the relicensing proceeding. The withdrawals are conditioned on the Commission's approval of the transfer.

Public notice of the transfer application was issued on July 26, 2001, setting a deadline of August 24, 2001 for filing comments, protests, and motions to intervene. By notice issued August 29, 2001, the deadline was extended through August 31. The U.S. Department of the Interior (Interior) filed comments and a motion to intervene. The Commonwealth of Massachusetts (Massachusetts) filed a motion to intervene. The Town

of South Hadley, Massachusetts, filed comments, individually, and jointly filed with Trout Unlimited and the Connecticut River Watershed Council, (South Hadley et al.) a motion to intervene in opposition to the transfer. On August 31, 2001, and September 5, 2001, respectively, HG&E and HWP filed an answer to the comments, protests, and motions to intervene.⁴

DISCUSSION

Interior and South Hadley et al. express concern that the transfer will be used as a basis for transferee requesting extensions of time for complying with license requirements. Interior requests that the Commission require consultation with resource agencies and non-governmental organizations for future requests for extensions of time.

However, the timing of a compliance action is an administrative matter between the licensee and the Commission. The exception is where the license requirement involved states that an entity must be consulted with respect to any request for extensions of the deadline established therein.⁵ But, there is no proper basis for amending the project license to include provisions giving resource agencies and non-governmental organizations consultation authority for extensions of time, as Interior proposes.

Interior and Massachusetts request conditions on the transfer, or in the alternative, issuance of an order prior to, or simultaneously with, the transfer order, requiring protection in perpetuity of the Bachelor Brook and Stony Brook properties, which were identified in the new license with other lands to be protected, but which, according to the Settlement Agreement, are not fully included in the property to be transferred to HG&E. South Hadley et al., oppose the transfer, absent conditions protecting not only the Bachelor Brook and Stony Brook properties⁶ but also a condition to revitalize the Texon Mill complex at the South Hadley end of the project dam.

The Comprehensive Recreation and Land Management Plan (CRLMP), filed by HWP in compliance with Article 418 of the new license, is pending before the Commission in Project No. 2004-086. The amount of acreage of the Bachelor Brook and Stony Brook properties to be included for protection under the license, and any license requirements for the Texon Mill complex, are at issue in that proceeding.⁷ A transfer of license does not alter a project's environmental impacts, or the determination of what mitigation measures are warranted.⁸ This is not the proper forum to address the scope of

protection for the Bachelor Brook and Stony Brook properties or the disposition of the Texon Mill complex. However, standard license Article 5 requires licensees to hold rights sufficient to fulfill all license requirements, and Article 5 imposes an ongoing obligation that applies to changes in the scope of project property.⁹ The transferee will be required to obtain sufficient interests in lands that are or may become part of the project.

In separate comments, the Town of South Hadley challenges the findings in the Order Modifying and Approving Shoreline Erosion Remediation Plan Under Article 403 issued August 1, 2001.¹⁰ The proper place for such a challenge is a request for rehearing of the August 1 order. As for the Town of South Hadley's question about who will be responsible for erosion remediation following this transfer, when a license is transferred, the transferee steps into the shoes of the transferor and is subject to any and all requirements to which the transferor was subject under the license and the Commission's orders thereunder.¹¹

Massachusetts asks that the revised water quality certification issued by the Massachusetts Department of Environmental Protection for the project on February 14, 2001, and filed on March 13, 2001,¹² be made part of the license. However, the revised water quality certification filing is a matter outside the scope of this proceeding. Moreover, as noted, the transferee will step into the shoes of the transferor and therefore will be bound by the revised certification to the same extent as the transferor.

CONCLUSIONS

The transferor has generally complied with the terms and conditions of the new license.

HG&E is qualified to hold the license and to operate the properties under the license, and it has agreed to accept all the terms and conditions of the license, and to be bound by the license as if it were the original licensee.

The proposed transfer is consistent with the Commission's regulations and is in the public interest.

The Director orders:

(A) Transfer of the license for the Holyoke Hydroelectric Project No. 2004, from Holyoke Water Power Company to The City of Holyoke Gas & Electric Department is approved.

(B) The transferor shall pay all annual charges that accrue up to the effective date of the transfer.

(C) Approval of the transfer is contingent upon: (1) transfer of title of the properties under license and delivery of all license instruments to the transferee, which shall be subject to the terms and conditions of the license as though it were the original licensee; and (2) the transferee acknowledging acceptance of this order and its terms and conditions by signing and returning the attached acceptance sheet. Within 60 days from the date of this order, the transferee shall submit certified copies of all instruments of conveyance and the signed acceptance sheet.

(D) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 CFR 385.713.

J. Mark Robinson
Director
Office of Energy Projects

Project No. 2004

IN TESTIMONY of its acknowledgment of acceptance of all of the terms and conditions of this order, The City of Holyoke Gas & Electric Department, this _____ day of _____, 20__, has caused its corporate name to be signed hereto by _____, its President, and its corporate seal to be affixed hereto and attested by _____, its Secretary, pursuant to a resolution of its Board of Directors duly adopted on the _____ day of _____, 20__, a certified copy of the record of which is attached hereto.

By _____

Attest:

Secretary

¹88 FERC ¶ 61,186 (1999). The project is required to be licensed under Section 23(b)(1) of the Federal Power Act. The original license for the project (8 FPC 471 (1949)) expired on August 31, 1999. The new license was issued on August 20, 1999, and made effective September 1, 1999.

²On August 31, 1999, HWP filed a Preliminary Motion to Stay Certain License Conditions, and on September 20, 1999, HWP filed a Motion for Rehearing and Supplement to Preliminary Motion for Stay. Requests for rehearing were also filed by the Town of South Hadley; Massachusetts Municipal Wholesale Electric Company; Ashburnham Municipal Light Plant; Interior; the City of Holyoke, Massachusetts; the National Marine Fisheries Service; and Trout Unlimited. The transfer application, p. 3, states that HG&E will assume HWP's position and rights with respect to the above motion for stay and rehearing requests.

³Exhibit A of the transfer application.

⁴While Rule 213(a)(2) of the Commission's Rules of Practice and Procedure 18 CFR 385.213(a)(2) (2001)) prohibits answers to protests, the answers have been fully considered in order to make an informed decision in this case. Neither HWP nor HG&E oppose the motions to intervene. Since the motions are timely and unopposed, they are automatically granted. 18 CFR 385.214(c)(1).

⁵See Bangor Hydro-Electric Company, 87 FERC ¶ 61,035 (1999).

⁶On August 31, 2001, Ronald Kreisman, Esquire, on behalf of the Town of South Hadley, filed a letter reiterating arguments supporting the Town's requested conditions regarding the Bachelor Brook and Stony Brook properties.

⁷See the new license (88 FERC at p. 61,617-18) where the Commission found that the HWP should propose recreational requirements for the Texon Mill complex and that HWP should be permitted to propose the portions of its Bachelor Brook and Stony Brook parcels that should be included within the project boundary, subject to appropriate restrictions.

⁸See, e.g., Menominee Company and N.E.W. Hydro, Inc., 74 FERC ¶ 61,023, at p. 61,067 (1996).

⁹Compare Georgia Power Company, 31 FERC ¶ 61,014 (1985), reh'g denied, 32 FERC ¶ 61,237 (1985), where the Commission extended a licensed project's boundary to require the licensee to provide reasonable public access to recreational facilities and noted the licensee's obligation under standard license Article 5 to acquire all lands necessary to construct, operate, and maintain the project, as modified.

¹⁰96 FERC ¶ 62,100.

¹¹See Menominee Company and N.E.W. Hydro, Inc., supra, 74 FERC at p. 61,067.

¹²See the Final Decision, Revised 401 Water Quality Certification, and Settlement Agreement, filed by the Massachusetts DEP on March 19, 2001.

111 FERC ¶ 61,106
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Pat Wood, III, Chairman;
Nora Mead Brownell, Joseph T. Kelliher,
and Suedeem G. Kelly.

Holyoke Gas & Electric Department

Project Nos. 2004-075

Holyoke Gas & Electric Department, Ashburnham
Municipal Light Plant, and Massachusetts Municipal
Wholesale Electric Company

11607-002

ORDER APPROVING SETTLEMENT AGREEMENT, AMENDING LICENSE, AND
DISMISSING STAY REQUEST

(Issued April 19, 2005)

1. Holyoke Gas & Electric Department (Holyoke G&E)¹ has filed an offer of settlement resolving issues relating to the new license issued by the Commission to Holyoke G&E's predecessor, Holyoke Water Power Company (Holyoke Water Power), authorizing the continued operation of the Holyoke Hydroelectric Project No. 2004. This order approves the offer of settlement and amends the project license accordingly. It also dismisses a stay request rendered moot by the amendment of the license. This order is in the public interest because it resolves issues regarding the project license in a manner consistent with the public interest and with the intent of the parties to the licensing proceeding.

Background

2. The 43.8-megawatt Holyoke project is located on the Connecticut River in Hampden, Hampshire, and Franklin Counties, Massachusetts. In an order issued on August 20, 1999,² the Commission issued a new license (1999 License) for the project to Holyoke Water Power and denied a competing license application filed jointly by Holyoke G&E, Ashburnham Municipal Light Plant (Ashburnham), and the

¹ Holyoke G&E is a department of the City of Holyoke.

² 88 FERC ¶ 61,186.

Massachusetts Municipal Wholesale Electric Company (Massachusetts Electric).³ The new license included a water quality certification that had been issued by the Massachusetts Department of Environmental Protection (Massachusetts DEP) on July 28, 1999, but was pending on appeal before that state body. The license was also issued before completion of consultation on threatened and endangered species, but with a requirement that the licensee file a threatened and endangered species protection plan based on consultation with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NOAA Fisheries).⁴

3. Requests for rehearing were filed by Holyoke Water Power; the City of Holyoke, Massachusetts (on behalf of Holyoke G&E); Ashburnham, Massachusetts Electric;⁵ the United States Department of the Interior (Interior); NOAA Fisheries; Trout Unlimited, and the Town of South Hadley. In addition, Holyoke Water Power requested a stay of certain license conditions contained in the water quality certification pending completion of Massachusetts DEP's administrative process and pending rehearing before the Commission. Objections to the stay motion were filed by the Commonwealth of Massachusetts (Massachusetts), and jointly by Interior and the Department of Commerce (Commerce).

4. On rehearing, the parties argued that the Commission had erred by issuing the license: (1) before completion of the state's proceeding concerning Holyoke Water Power's appeal of the state's water quality certification; and (2) before consultation on threatened and endangered species had been completed by the Commission's receipt of a biological opinion (BO) containing incidental take conditions. They also made various arguments taking issue with the Commission's determinations related to recommendations filed pursuant to section 10(j) and prescriptions filed under section 18 of the FPA.⁶ In addition, the City of Holyoke, Ashburnham, and Massachusetts Electric argued that the Commission erred in choosing Holyoke Water Power's application over theirs. Finally, the Town of South Hadley (South Hadley) requested its inclusion as a

³ Holyoke G&E and Ashburnham are municipal electric departments. Massachusetts Electric is a corporate and political subdivision of the State of Massachusetts, with cities and towns as members, which is empowered to own and operate electric power facilities, and buy and sell power on behalf of its members. *See* 88 FERC at 61,601 n. 4.

⁴ *See* Article 416, 88 FERC at 61,634.

⁵ Ashburnham's and Massachusetts Electric's requests were simply short statements supporting City of Holyoke's rehearing request.

⁶ 16 U.S.C. §§ 803(j) and 811, respectively.

consulting party in Articles 403, 404, 407 and 417 of the license, and correction of the location of a trail referenced in Article 418.

5. Subsequently, Holyoke Water Power transferred its license to Holyoke G&E.⁷ As the transferee, Holyoke G&E has stepped into the shoes of Holyoke Water Power in relation to all matters related to the new license, including the rehearing proceeding.⁸

6. On March 12, 2004, Holyoke G&E filed an offer of settlement, in which it was joined by Interior, through FWS; NOAA Fisheries; the Commonwealth of Massachusetts, Department of Environmental Protection (Massachusetts DEP); the Commonwealth of Massachusetts, Division of Fisheries and Wildlife (Massachusetts DFW); Trout Unlimited; Connecticut River Watershed Council; and South Hadley. Holyoke G&E asks the Commission to approve the settlement and incorporate its terms and conditions, as set out in the proposed modified license articles (Articles 301-422) contained in Appendix A to the settlement, without material change or modification. The settlement also provides for adoption of the water quality certification revised in accordance with the final decision of the Massachusetts DEP, and filed with the Commission on March 1, 2001. In addition, by letter filed March 16, 2005, Holyoke G&E notified the Commission that NOAA Fisheries' final biological opinion (BO), filed January 27, 2005, is consistent with the settlement, and requested that it be treated as supplementing the settlement. Holyoke G&E states that, once Commission approval of the settlement is final and no longer subject to appeal, the settlement parties with pending rehearing requests will withdraw those requests.

7. As discussed below, this order approves the settlement and amends the license to adopt the settlement's proposed modified license articles with minor changes. Since a

⁷ See 96 FERC ¶ 62,283 (2001). By letters filed July 27, 2001, the City of Holyoke, Ashburnham, and Massachusetts Electric withdrew their rehearing requests, subject to the Commission's approval of the transfer to Holyoke G&E, and subject to closing of the sale of the project from Holyoke Water Power to Holyoke G&E. The transfer was approved on September 20, 2001, and on December 28, 2001, Holyoke G&E filed its acceptance and conveyance documents and a letter noting that the sale had been closed on December 14, 2001. Receipt of the acceptance sheet and instruments of conveyance was acknowledged by a letter issued on February 7, 2002. Accordingly, the rehearing requests of City of Holyoke, Ashburnham, and Massachusetts Electric are deemed withdrawn.

⁸ *Id.* at 64,565, ordering paragraph (C). However, because Holyoke G&E is a municipality, it is not required to establish and maintain an amortization account. See *City of Hamilton*, 98 FERC ¶ 61,295 (2002). Accordingly, we have deleted Article 203 of the 1999 License, which contained that requirement.

revised water quality certification has now been issued, and we are issuing an order that disposes of the issues in the rehearing proceeding, Holyoke G&E's stay request is dismissed as moot.

Discussion

A. The Revised License Articles

8. For the most part, the revised license articles proposed by the offer of settlement do not result in substantive changes to the license requirements, but rather update them to provide clarity as to the manner in which those requirements will be implemented. We have made only very minor modifications to them, and we will replace the 1999 License's Articles 301-422 with the settlement's proposed Articles 301-422, as modified.⁹ For convenience and ease of administration, the order reprints below the complete set of license articles (Articles 201-422), and appendices to the license.¹⁰

9. A number of the revised license articles simply update articles adopted in the 1999 License. Where the 1999 License articles required the development and filing of plans, the proposed substitutions require implementation of the plans that have, in the interim, been filed, and approved by the Commission.¹¹ The settlement proposal also deletes

⁹ The settlement's proposed Articles 302-306, and 422, are identical to those in the 1999 License.

¹⁰ For the license articles, *see* ordering paragraph G.

¹¹ Articles requiring such implementation include: Article 403, shoreline erosion remediation plan approved in 96 FERC ¶ 62,100 (2001), and amended in 105 FERC ¶ 62,098 (2003); Article 404, water quality plan approved in 96 FERC ¶ 62,144 (2001); Article 408, comprehensive canal operations plan approved in 103 FERC ¶ 62,130 (2003); Article 409, aquatic habitat plan approved in 103 FERC ¶ 62,175 (2003); Article 410, downstream fish passage plan approved in 103 FERC ¶ 62,165 (2003); Article 411, upstream fish passage plan approved in 103 FERC ¶ 62,177 (2003), and amended in 106 FERC ¶ 62,213 (2004); Article 416, threatened and endangered species protection plan, approved in 103 FERC ¶ 62,131 (2003); Article 417, invasive species monitoring plan, approved in 96 FERC ¶ 62,174 (2001), and amended in 109 FERC ¶ 62,186 (2004); Article 418, comprehensive recreation and land management plan, approved in 106 FERC ¶ 62,243 (2004), rehearing granted in part in 109 FERC ¶ 61,206 (2004); and Article 419, cultural resources management plan, approved in 95 FERC ¶ 62,274 (2001). In addition, discrepancies between two studies conducted pursuant to Article 405 resulted in the development of a comprehensive operations and flow plan. *See* 103 FERC ¶ 62,178 (2003).

Article 419 of the 1999 License. That article required the licensee to file a plan outlining measures to minimize effects on recreational boaters during installation of the rubber dam. Since the rubber dam has now been installed, the requirement is no longer needed, and its deletion is appropriate. Finally, proposed Articles 414 and 421 set out requirements that were not specifically required as articles in the 1999 License, but which are reasonable.¹²

10. Certain requirements have been changed or expanded upon by the settlement's proposed articles, and we approve those changes. Article 405 of the 1999 License required the licensee to operate the project in a run-of-river mode (outflow approximating inflow) and maintain a minimum impoundment elevation of 100.6 feet, with an allowable fluctuation of plus or minus 0.2 feet. However, operating experience under the license showed that the original run-of-river provision exacerbated fluctuations in the project's headwater reaches. Therefore, the proposed Article 405 requires the project to maintain a minimum impoundment elevation of 100.4 feet with an allowable fluctuation of plus or minus 0.2 feet, and provides for the licensee to conduct an evaluation to determine whether there should be modifications to the run-of-river operations.¹³

11. Proposed Article 406 provides for higher zone-of-passage and interim bypassed minimum flows than those specified in the 1999 License. It also includes a provision for a flow study to determine a permanent bypass minimum flow. These changes are reasonable and in the public interest. The higher zone-of-passage flows will provide a flow sufficient for safe and effective migratory fish passage through the bypassed reach. The higher bypass minimum flows will protect water quality as well as aquatic and fishery resources in the bypassed reach.¹⁴ The flow study provision will leave open the possibility of modifying the bypass minimum flows based on additional study, and could

¹²Article 414 requires the licensee to prepare and file annually with the Commission a construction plan for fish passage facilities. The condition will allow the Commission to better track compliance with annual requirements for fish passage construction. Article 421 simply requires the licensee to comply with the water quality certification issued on February 14, 2001. Many of the certification's requirements are also contained in various license articles (e.g., Articles 401, 404, 406-408, 410- 414, 416, and 417).

¹³ The water quality certification, Condition 9, references a minimum impoundment elevation of 103.1 feet plus or minus 0.2 feet. We believe that the certification's reference is a misprint, and that the 100.4 feet plus or minus 0.2 feet requirement set out in the settlement's proposed Article 405 is the intended requirement.

¹⁴ For staff's flow analysis, *see* the final Environmental Impact Statement (EIS), at pages 4-18to 4-26, 4-151 to 160, 5-11, and C-14 to C-17.

lead to identification of a lower flow providing the same or similar levels of protection to aquatic habitat and organisms.¹⁵

12. Articles 410 through 413, dealing with upstream passage, downstream passage, eel passage, and the monitoring of such passage, are consistent with the requirements of the 1999 License, but set out the licensee's obligations with greater specificity. They also expand and clarify the schedule for implementation of the articles' required measures.¹⁶

13. All of the consultation requirements of the license are set out in proposed Article 420. The article also states that the licensee must comply with the conditions imposed on it by Part IV of the settlement, and the appendices referenced therein. Part IV of the settlement references Part III of the settlement, as well as settlement appendices related to the operating protocol for a downstream sampling facility, a description of the settlement's proposed research and construction activities related to downstream fish passage, a shortnose sturgeon handling plan, and overflow operating procedures. Parts III and IV of the settlement, and the settlement appendices which they reference are appended to the license, for clarity and informational purposes, as appendices C through G to this order.¹⁷

B. Water Quality Certification Conditions

14. Under Section 401(a) of the Clean Water Act (CWA),¹⁸ the Commission may not

¹⁵ Article 406(f) requires monitoring consistent with Articles 407 and 408. However, the text of Article 408 has been incorporated in Article 407, and we have revised Article 406(f) to reflect that fact.

¹⁶ Article 412(a) requires the licensee to provide interim measures for upstream eel passage consistent with an interim upstream eel passage plan supposedly filed with the Commission on December 31, 2003. We have not been able to document that this plan was filed. However, it appears that the provisions to which the proposed Article 412 refers are contained in the upstream fish passage plan approved pursuant to Article 411. We will revise Article 412(a) accordingly. (The licensee did file a request to install interim eel ladders at the project, which the Commission's New York Regional Office approved on August 6, 2003.)

¹⁷ See Appendix C (Parts III and IV of the Settlement Agreement); Appendix D (downstream sampling facility operating protocol); Appendix E (detailed description of Holyoke G&E proposed settlement downstream research and construction; Appendix F (shortnose sturgeon handling plan); and Appendix G (No. 2 overflow operating procedures).

¹⁸ 33 U.S.C. § 1341(a)(1).

issue a license for a hydroelectric project unless the state water quality certifying agency has either issued water quality certification for the project or has waived certification by failing to act on a request for certification within a reasonable period of time, not to exceed one year. Section 401(d) of the CWA provides that state certification shall become a condition on any license that is issued.¹⁹

15. The Massachusetts DEP timely issued a water quality certification for the Holyoke project on July 28, 1999. On August 18, 1999, Holyoke Water Power filed with the Massachusetts DEP an appeal of the certification. While that appeal was pending, the Commission issued the new license for the Holyoke project, attaching, as an appendix, 30 conditions contained in the July 28, 1999 Certification.²⁰

16. On March 19, 2001, the Massachusetts DEP filed with the Commission water quality certification provisions revised in accordance with a settlement agreement approved by the DEP in the state's appellate proceeding.²¹ The revised certification provisions, which are consistent with the terms of the settlement, will be substituted for

¹⁹ 33 U.S.C. § 1341(d).

²⁰ 88 FERC at 61,639. The Massachusetts DEP had originally issued one certification for both Holyoke Water Power's and Holyoke G&E's proposals. That certification contained a total of 37 conditions but, seven of them were applicable only to Holyoke G&E's proposal, not to that of Holyoke Water Power, who was granted the new license.

²¹ The revised certification imposes 23 conditions on the license for this project, including conditions which require: (1) an instantaneous run-of-river mode, stabilizing the impoundment to within 0.2 feet of normal pond elevation (i.e., 0.2 feet below the elevation of the new rubber dam crest) (Condition 9); (2) minimum flows for the bypassed reach (Condition 11); (3) project flows, including specified flow distribution prioritizations for the canal, the bypassed reach, the fish passage attraction facilities, zone of passage flows, and the Hadley Falls Station, during the Atlantic salmon downstream migratory period (April 1 through June 15 of each year), and during juvenile clupeid downstream migration period (September 1 through November 15 of each year) (Condition 12); (4) implementation of a canal system operation plan, a plan for protection and monitoring of aquatic resources in the canal system, and a plan to exclude shortnose sturgeon and other fish from the fishlift attraction water (Condition 13); (5) redesign and reconstruction of the project's upstream and downstream fish passage facilities, as well as requirements related to operation of the fish passage facilities (Condition 14); fish monitoring and counting (Condition 15); and submission to Massachusetts DEP of a riparian management plan (Condition 19).

the July 28, 1999 Certification. They are attached to this order as Appendix A and required by Article 421.

C. Threatened and Endangered Species

17. On April 19, 1999, Commission staff issued letters to FWS and to NOAA Fisheries, concluding that expanding, operating, and maintaining the project, with the staff's recommended measures, is not likely to adversely affect the shortnose sturgeon (in the letter to NOAA Fisheries), or the American bald eagle or Puritan tiger beetle (in the letter to FWS). The letters asked FWS and NOAA Fisheries to concur in staff's conclusion that formal consultation under section 7 of the Endangered Species Act (ESA)²² was not required.

18. FWS did not respond to staff's request for concurrence. NOAA Fisheries advised that it did not concur, and requested the initiation of formal consultation to assess the impact of the project's operation on endangered shortnose sturgeon and the incidental and unauthorized taking of shortnose sturgeon as a result of such operation.²³ On June 4, 1999, Commission staff initiated formal consultation with NOAA Fisheries, provided it with sections of the draft environmental impact statement (EIS) constituting staff's biological assessment of sturgeon, and requested a BO by July 15, 1999.

19. Neither the consultation with FWS or NOAA Fisheries was completed prior to issuance of the new license. However, the Commission determined that compliance with the provisions of the new license would potentially enhance, and not adversely alter, the environmental status quo, or make irreversible commitments of resources foreclosing the formulation or implementation of any reasonable and prudent alternative measures.²⁴ In addition, the Commission stated it would reserve authority to revise its terms and conditions to incorporate any measures necessary to comply with the ESA in light of any later-issued BO.²⁵

20. On October 13, 1999, after license issuance, FWS filed a letter stating its concurrence in the Commission's finding that the 1999 License for the Holyoke project

²² 16 U.S.C. § 1531-43.

²³ Section 9 of the ESA makes it unlawful for any person to "take" any endangered species. 16 U.S.C. § 1538. The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." See ESA Section 3(10), 16 U.S.C. § 1532(19).

²⁴ See 88 FERC at 61,616.

²⁵ *Id.*

would not adversely affect the bald eagle, but stating that the activities authorized by the 1999 License would have adverse effects on the Puritan tiger beetle. It identified four potential measures to eliminate or reduce the adverse effects.²⁶

21. Pursuant to Article 416 of the 1999 License, and based on consultation with FWS, the licensee developed a threatened and endangered species protection plan that included measures satisfying FWS's concerns related to the Puritan tiger beetle.²⁷ FWS's comments on the draft plan were incorporated in the final plan that was filed with the Commission, and the Commission approved the plan on June 6, 2003.²⁸ Proposed Article 416 of the settlement, to which FWS is a party, requires the licensee to implement the threatened and endangered species protection plan approved by the Commission. In addition, proposed Article 405 requires the licensee to evaluate run-of-river operation in order to address water level fluctuations in the project's headwater reach, and associated effects on the Puritan tiger beetle and its habitat. Since the provisions of the threatened and endangered species protection plan, coupled with the provisions of the settlement, were developed in concert with FWS and are consistent with the measures recommended by FWS, it appears that issues regarding the beetle have been adequately addressed.

22. NOAA Fisheries filed its draft BO on August 18, 2000, after issuance of the 1999 License. It filed its final BO on February 1, 2005, after the settlement had been filed. The final BO treats the provisions of the settlement as the proposed action for purposes of

²⁶ These were measures to: (1) minimize erosion from water level fluctuations and boats; (2) continue a program of educating the public and policing recreational activities at beetle habitat sites, and identify additional ways to avoid or reduce the adverse effects on the Puritan tiger beetle from recreational use of shorelines; (3) implement a time-of-year restriction on flashboard replacement and installation of the rubber dam; and (4) identify potential tiger beetle habitat for protection, restoration and management as part of the threatened and endangered species plan required under Article 416 of the 1999 License.

²⁷ The plan includes requirements that the licensee: (1) conduct public education efforts; (2) continue to work with FWS and Massachusetts DFW to provide historic water level elevation data, impoundment maps and hydrology information to further the understanding of species' habitat needs; (3) provide support staff and share in research expenses; (4) establish no-wake zones at rainbow beach and provide appropriate signage (e.g., buoys, channel markers, posted speed limits, etc.); (5) consult with stakeholders to identify land within the project boundary suitable as beetle habitat, provide relocation support, and restrict use of such areas; and (6) undertake monitoring and reporting activities.

²⁸ 103 FERC ¶ 62,131.

ESA consultation. It finds that issuance of a license, as conditioned by the settlement and the settlement's proposed license articles, is likely to adversely affect, but is not likely to jeopardize the continued existence of, the endangered shortnose sturgeon.²⁹ To ensure that any incidental taking of shortnose sturgeon³⁰ will be authorized, NOAA Fisheries has identified reasonable and prudent measures to avoid or minimize incidental taking, as well as terms and conditions to implement those measures.³¹

23. The reasonable and prudent measures included as part of the incidental take statement require the licensee to minimize incidental taking of shortnose sturgeon that will result from: (1) collecting and handling at the downstream sampling station and stranding; and (2) inadequate water quality in the holding tanks at the downstream sampling station. NOAA Fisheries specifies five terms and conditions to implement these measures.³² NOAA Fisheries states that the incidental take statement and its

²⁹ NOAA Fisheries has not designated critical habitat for this species.

³⁰ NOAA Fisheries found that taking at this project may result from injury and mortality caused by attempts at upstream and downstream passage, as well as by harassment, trapping, capturing or collecting at the upstream and downstream fish passage facilities. Taking may also result from entrainment through the power facilities before modifications are complete, entrainment over the spillway or through the Bascule gate, abandonment of upstream or downstream passage, passage through the Holyoke bypassed reach, and stranding in the pools downstream from the Holyoke dam.

³¹ It has also provided detailed information on the amount of incidental taking authorized for the proposed action. *See* charts in the BO, at pages 66, 70, and 71, which set out levels of incidental take authorized for upstream migration, downstream migration, and stranding in pools below the dam for the time period before all modifications to the upstream and downstream fish passage facilities are completed, and for the time period after all modifications are completed.

³² The terms and conditions to implement measure (1) require the licensee to: (a) follow the Shortnose Sturgeon Handling Plan (included as Appendix F to this license order); (b) consult annually with NOAA Fisheries regarding the need for updates to the Handling Plan; (c) submit an annual report to NOAA Fisheries on the status of shortnose sturgeon at the Holyoke Project; and (d) notify NOAA Fisheries when the project reaches 75 percent of the incidental take statement levels for shortnose sturgeon. The term and condition to implement measure (2) requires the licensee to monitor water quality in the holding tanks used at the project's downstream sampling facility. It provides that sturgeon shall not be held for more than 12 hours. Water depth in the holding tanks shall be of sufficient depth to not unduly stress individual sturgeon. Water temperature shall not exceed 27° celsius and dissolved oxygen shall be at least 5 milligrams per liter (mg/l) at all times.

accompanying recommended reasonable and prudent measures and terms and conditions constitute an adaptive management process; that is, the monitoring that they require will continue to supply information on the level of take resulting from the proposed action, providing a basis for appropriate action, if needed.

24. We adopt as conditions of the license the incidental take conditions that implement the reasonable and prudent measures of the incidental take statement. These terms and conditions are set forth in Appendix B to this order and required by ordering paragraph E. In addition, because the 1999 License did not include monitoring, reporting, and notification requirements for shortnose sturgeon at the Holyoke Project, and since the BO was filed after the settlement, it is not clear whether the settlement and proposed license articles accommodate those requirements. Therefore, we have also amended Article 416 to require monitoring of shortnose sturgeon in accordance with the terms and conditions of NOAA Fisheries' incidental take statement.

25. In addition to the incidental take conditions, NOAA Fisheries recommends the implementation of several conservation measures³³ related to future research and monitoring of shortnose sturgeon passage and migration in the Connecticut river.

26. We support the on-going conservation efforts for shortnose sturgeon in the Connecticut River and, to the degree that those measures relate to the project, the license includes articles that address NOAA's recommended measures.³⁴ However, conservation measures are discretionary recommendations.³⁵ In this instance, the recommended measures relate primarily to general research. While we can require a licensee to do research prior to licensing that is needed for evaluation of its application, or to do research after licensing in order to monitor project effects, we do not have authority to require it to do more general research. Nevertheless, there is nothing in the settlement or

³³Section 7(a)(1) of the ESA directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species.

³⁴Article 410 addresses aspects of conservation measures (1), (2), and (5). Articles 404, 405, 411 and 413 address aspects of conservation measure (3). Article 411 addresses the requirement of conservation measure (4). Finally, the shortnose sturgeon handling plan, attached as Appendix F to this license, addresses the concerns raised by conservation measures (6) and (7).

³⁵The regulations implementing the ESA define conservation recommendations as "suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information." See 50 CFR § 402.02.

the license which precludes the implementation of the measures, and we encourage the licensee to continue its cooperation with the resource agencies to manage the shortnose sturgeon.

Comprehensive Development

27. Under the amended license as conditioned by the settlement, the final water quality certification, and the final BO, the project will operate in a run-of-river mode; provide minimum flows for the bypassed reach, and upstream and downstream fish passage; and implement measures to protect endangered species. Based on our review of the settlement agreement filed by the parties, the water quality certification, the BO, our review of the environmental and economic effects of the proposed project and its alternatives,³⁶ and our analysis pursuant to FPA sections 4(e) and 10(a)(1), we find that the Holyoke Project, as conditioned herein, will be best adapted to the comprehensive development of the Connecticut river for beneficial public uses.

The Commission orders:

(A) The offer of settlement, filed on March 12, 2004, by Holyoke Gas and Electric Department, is approved.

(B) The requests for rehearing filed on September 20, 1999, by Holyoke Water Power Company, the City of Holyoke, Massachusetts, Ashburnham Municipal Light Plant, and Massachusetts Municipal Wholesale Electric Company are deemed withdrawn.

(C) The stay request filed by Holyoke Water Power on August 31, 1999, is dismissed.

(D) The license for the Holyoke Hydroelectric Project No. 2004 is amended by replacing Appendix A of the August 20, 1999 Order issuing license with the Appendix A (water quality certification conditions) attached to this order.

(E) The license for the Holyoke Hydroelectric Project No. 2004 is amended to make the license subject to the terms and conditions of the incidental take statement set forth in Appendix B to this order.

(F) The license for the Holyoke Hydroelectric Project No. 2004 is amended to attach, for clarity and information, appendices C (Parts III and Part IV of the settlement agreement filed with the Commission on March 12, 2004), D (Downstream Sampling

³⁶ The measures adopted in the license as a result of the settlement were addressed in the final EIS for the 1999 License.

Facility Operating Protocol), E (Detailed Description of Holyoke G&E Proposed Settlement Downstream Research and Construction (2004-2009/10)), F (Shortnose Sturgeon Handling Plan), and G (No. 2 Overflow Operating Procedures).

(G) The license for the Holyoke Hydroelectric Project No. 2004 is amended by replacing ordering paragraphs (G) and (H) of the August 20, 1999 Order issuing license with the following text:

(G) This license is subject to the articles set forth in Form L-3 (October 1975) (54 FPC 1817), entitled "Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States," and the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective as of the date of commencement of project construction or relicensing.

For the purpose of reimbursing the United States for the cost of administration of Part I of the FPA, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 42,891 kW.

Article 202. Within 45 days of the date of issuance of the license, the licensee shall file an original set and two duplicate sets of aperture cards of the approved exhibit drawings. The set of originals shall be reproduced on silver or gelatin 35mm microfilm. The duplicate sets shall be copies of the originals made on diazo-type microfilm. All microfilm shall be mounted on type D (3-1/4' X 7-3/8") aperture cards.

Prior to microfilming, the FERC Drawing Number (11214-1 through 11214-7) shall be shown in the margin below the title block of the approved drawing. After mounting, the FERC Drawing Number shall be typed on the upper right corner of each aperture card. Additionally, the Project Number, FERC Exhibit (e.g., F-i, G-l, etc.), Drawing Title, and date of this license shall be typed on the upper left corner of each aperture card.

The original and one duplicate set of aperture cards shall be filed with the Secretary of the Commission, ATTN DLC/ECRB. The remaining duplicate set of aperture cards shall be filed with the Commission's New York Regional Office.

Article 203. Authority is reserved to the Commission to require the licensee, in a proceeding specific to this license, to conduct studies, modify minimum flow releases, or otherwise make reasonable provisions for modifying project facilities or operations as necessary to comply with the Endangered Species Act, where it concerns the federally listed endangered shortnose sturgeon, threatened bald eagle, and Puritan tiger beetle.

Article 301. The licensee shall commence construction of the enhancements to the Project works pursuant to the schedule(s) set forth in the individual License Articles.

Article 302. The licensee shall, at least 60 days prior to the start of construction, submit one copy to the Commission's Regional Director and two copies to the Commission (one of these shall be a courtesy copy to the Director, Division of Dam Safety and Inspections), of the final contract drawings and specifications for pertinent features of the Project, such as water retention structures, powerhouse or equivalent, and water conveyance structures. The licensee shall include, in the plans and specifications submitted, a soil erosion control plan. The Commission may require changes in the plans and specifications to assure a safe and adequate Project. If the licensee plans substantial changes to location, size, type, or purpose of the water retention structures, powerhouse or equivalent, or water conveyance structures, the plans and specifications must be accompanied by revised Exhibit F and G drawings, as necessary.

Article 303. Within 90 days after finishing construction, the licensee shall file, for Commission approval, eight copies of the revised exhibits A, F, and G describing the Project as built. The licensee shall submit six copies to the Commission, one copy to the Commission's Regional Director, and one to the Director, Division of Licensing and Compliance.

Article 304. Within 30 days after any changes in Project lands resulting from License Article 418, the licensee shall file, for Commission approval, a revised Exhibit G showing the changes in Project lands.

Article 305. If the Licensee's Project was directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement during the term of the original license (including extensions of that term by annual licenses), and if those headwater benefits were not previously assessed and reimbursed to the owner of the headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for those benefits, at such time as they are assessed, in the same manner as for benefits received during the term of this new license.

Article 306. Before starting construction, the licensee shall review and approve the design of contractor-designed cofferdams and deep excavations, and shall make sure construction of cofferdams and deep excavations is consistent with the approved design. At least 30 days before starting construction of the cofferdam, the licensee shall submit one copy to the Commission's Regional Director and two copies to the Commission (one of these copies shall be a

courtesy copy to the Commission's Director, Division of Dam Safety and Inspections), of the approved cofferdam construction drawings and specifications, and the letters of approval.

Article 401. *Inflatable Rubber Dam.* The licensee shall operate and maintain the inflatable rubber dam installed in November 2001 at the Project.

Article 402. *Construction Control Plan.*

(a) At least 90 days before the start of any construction-related activities, including but not limited to land-disturbing, land-clearing, and spoil-producing activities, the licensee shall file with the Commission for approval, and with the Massachusetts Department of Environmental Protection (Massachusetts DEP), a final construction control plan for the purpose of controlling erosion, bank stability, sedimentation, turbidity, and water pollutant effects.

Relevant plans shall be developed for all construction-related activities. The plan shall be based on: (a) actual-site geological, soil, slope, and groundwater conditions; and (b) the final Project designs for all associated temporary and permanent features.

The plan shall contain, at a minimum, the following six items:

- (1) a description of the actual site conditions;
- (2) measures proposed to control erosion, to prevent slope instability, and to minimize the quantity of sediment resulting from construction activities;
- (3) detailed descriptions, final drawings and specifications, and specific topographic locations of all control measures;
- (4) specific details of site preparation and restoration including grading, revegetation, and fuel storage;
- (5) pre-construction sediment sampling in areas with potential contaminated sediments with a requirement for removing any contaminated sediments found prior to construction; and
- (6) a specific implementation schedule and details for monitoring and maintenance programs during construction activities and site restoration.

(b) The licensee shall follow the consultation process described in License Article 420.

(c) The Commission reserves the right to require changes to the plan. No construction-related activities shall begin until the Commission notifies the licensee that the plan is approved. The licensee shall implement the plan as approved by the Commission, including any changes required by the Commission.

Article 403. *Shoreline Erosion Remediation Plan.*

(a) The licensee shall implement the Shoreline Erosion Remediation Plan, as approved by the Commission on August 1, 2001 (96 FERC ¶ 62,100), and amended by order issued on November 17, 2003 (105 FERC ¶ 62,098), for inventorying, evaluating, stabilizing and monitoring shoreline erosion sites in the Project area.

(b) The licensee shall follow the consultation process described in License Article 420, and shall also consult with Town of South Hadley.

(c) The Commission reserves the right to require changes to any proposed modifications to the plan. No erosion site remediation work shall begin until the Commission notifies the licensee that the modified plan is approved. The licensee shall implement the modified plan as approved by the Commission, including any changes required by the Commission. The licensee shall solicit and coordinate the cooperation of other parties in implementing the approved modified plan.

Article 404. *Water Quality Monitoring Plan.*

(a) The licensee shall implement the Water Quality Monitoring Plan, as approved by the Commission on August 10, 2001 (96 FERC ¶ 62,144).

(b) The licensee shall follow the consultation process described in License Article 420, and shall also consult with Town of South Hadley.

(c) The Commission reserves the right to require changes to any proposed modifications to the monitoring plan. The licensee shall implement the modified monitoring plan as approved by the Commission, including any changes required by the Commission. If the results of monitoring indicate that changes in Project structures or operations are necessary to ensure compliance with state water quality standards, the Commission may direct the licensee to modify Project structures or operations.

Article 405. *Holyoke Project Operations.*

(a) *Run-of-River Operations.* The licensee shall operate the Project in a run-of-river mode and maintain a minimum impoundment elevation of 100.4 feet National Geodetic Vertical Datum (NGVD), with an allowable fluctuation of ± 0.2 foot for the protection of water quality, aquatic and fisheries, and recreational

resources of the Holyoke Project and Connecticut River. However, the licensee shall conduct an evaluation of potential modifications to run-of-river operations to address the goals stated in (b)(1) below. Until such time as the Commission authorizes the licensee to modify the run-of-river mode of operation through the process described in (b) and (c) below, the licensee shall at all times act to minimize the fluctuation of the impoundment surface elevation by maintaining a discharge from the Project so that, at any point in time, flows, as measured immediately downstream of the Project tailrace, approximate the sum of the inflows to the Project impoundment.

(b) *Testing of potential modifications to Run-of-River Operations.* As approved as part of the Comprehensive Operations Flow Plan (COFP) by FERC on June 24, 2003 (103 FERC ¶ 62,178), the licensee shall implement a plan for testing potential modifications to run-of-river operations that provides for the following:

(1) Consultation by the licensee as described in (e) below to identify management objectives related to the following resource goals: (A) to more effectively limit water level fluctuations at Rainbow Beach and other habitat areas for the federally threatened and state endangered Puritan tiger beetle upstream of the Project Dam; (B) to prevent injury or significant impairment of essential behavioral patterns to the federally and state endangered shortnose sturgeon; (C) to balance the magnitude of the fluctuations in the lower and upper sections of the Impoundment; (D) to balance the impact on wetland areas adjacent to the lower and upper sections of the Impoundment; (E) to maintain the seasonally adjusted minimum flows into the bypassed reach and the canal system as stated in License Article 406; and (F) to the extent possible, reduce fluctuations in river flows downstream of the Project;

(2) A provision pursuant to which the licensee would perform hydraulic model studies to evaluate effects of various operating regimes relative to the stated resource goals identified in (1) above;

(3) Consultation by the licensee, as described in (e) below, to develop a preferred operating regime and compliance measures that balance the licensee's operation constraints and the resource goals identified in (1) above;

(4) Implementation and monitoring by the licensee of the preferred operating regime determined under (3) above for a trial period of 12 months from the date of implementation, with a provision for continuation of the testing for up to an additional 12 months, if the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NOAA Fisheries), the Massachusetts Division of Fisheries and Wildlife (Massachusetts DFW), the Massachusetts Department of

Environmental Protection (Massachusetts DEP) and the licensee agree that river conditions in the impoundment during the test period were not representative of typical river flow conditions;

(5) Notification and response if, during the testing of the modified run-of-river operations, the licensee is unable to meet the Bypass Habitat Flows or the Bypass Zone-of-Passage Flows described in License Article 406; such notice to be provided to FWS, NOAA Fisheries, Massachusetts DFW, Massachusetts DEP, Trout Unlimited (TU), and the Connecticut River Watershed Council (Watershed Council) within 24 hours; with the licensee reverting immediately to the existing minimum flow; and with consultation as described in (e) below to modify or terminate the test of the modified run-of-river operations;

(6) Preparation by the licensee of the following evaluations using the data collected during the trial period: (A) an evaluation of the effects of the modifications to the run-of-river operations on the federally and state threatened and endangered species; (B) a determination of any appropriate revision to the Threatened and Endangered Species Protection Plan (including any necessary changes to reflect state species); (C) a determination of measures as appropriate to avoid adverse impacts to the federally and state endangered shortnose sturgeon, including stranding; (D) an evaluation of how the modifications to the run-of-river operations affects the licensee's ability to achieve flow elevations in the bypassed reach (*i.e.*, Bypass Habitat Flows and Bypass Zone-of-Passage Flows pursuant to License Article 406); (E) a recommendation, if necessary, to modify the Texon Gage as a compliance measure for Bypass Habitat Flows and Bypass Zone-of-Passage Flows; (F) an evaluation of how the modifications to the run-of-river operations affect wetland areas adjacent to the lower and upper sections of the impoundment; (G) an evaluation of impacts of modified run-of-river operation on downstream flow fluctuations; and (H) to the extent possible, proposed measures to reduce fluctuations in river flows downstream of the Project;

(7) Circulation by the licensee of the results of the test of modified run-of-river operations and evaluations performed under the plan to FWS, NOAA Fisheries, Massachusetts DFW, Massachusetts DEP, TU, and the Watershed Council, and consultation thereafter as described in (e) below on a proposed long-term resolution of the issue.

(c) *Proposed modification of run-of-river operations.* In the event that there is consensus among the consulted parties as identified in (b)(4) above that a modification of the run-of-river operation requirement is needed to meet the goals stated in (b)(1) above, the licensee shall file the following with the Commission and the Massachusetts DEP on or before November 30, 2004 [or within 3 months after any extension of the test period by written agreement of the licensee and

FWS, NOAA Fisheries, Massachusetts DFW, and Massachusetts DEP, pursuant to (4) above]: (A) a report containing the results of the test of modified run-of-river operations, the evaluations performed under the plan, and any comments from the consulted parties; and (B) a proposed amendment to the COFP for a modified operating protocol. Copies of the report and proposed amendment shall also be provided to FWS, NOAA Fisheries, Massachusetts DFW, Massachusetts DEP, TU, and the Water Council. The licensee shall implement the modified run-of-river operating protocol as approved by the Commission.

(d) *Emergencies and short period modifications.* The run-of-river mode of operation and minimum impoundment surface elevation requirements may be temporarily modified if required by operating emergencies, so long as the emergency is beyond the control of the licensee, is not reasonably foreseeable, and could not have been avoided by the exercise of due care by the licensee. Further, releases may be temporarily modified because of an emergency for short periods upon mutual agreement between the licensee, FWS, NOAA Fisheries, Massachusetts DEP, and Massachusetts DFW. If Project operations are so modified, the licensee shall notify the Commission and FWS, NOAA Fisheries, the Massachusetts DEP and Massachusetts DFW in advance if knowable or as soon as possible otherwise, but no later than 24 hours after each such incident, and shall provide the reason for the modified flow. The licensee shall also comply with the additional requirements in Condition 9(b) of the Water Quality Certification issued by Massachusetts DEP on February 14, 2001 (as incorporated in Article 421).

(e) *Consultation with resource agencies and other parties.* The licensee shall follow the consultation process described in License Article 420, and shall distribute all reports to the resource agencies and other parties listed in that Article.

Article 406. *Flow Releases to the Holyoke Bypassed Reach.* The licensee shall release seasonally-adjusted minimum flows into the bypassed reach and into the canal system for the protection and enhancement of water quality and aquatic and fisheries resources as described in this License Article. The flows released into the bypassed reach when the fish lifts are not operational shall be of an amount that is determined to ensure an adequate water level in all bypassed channels for fish habitat and that protects the federally and state endangered shortnose sturgeon from injury or significant impairment to essential behavioral patterns (Bypass Habitat Flows). Additionally, the flows released into the bypassed reach when the fish lifts are operational shall be of an amount that is determined to ensure safe and successful passage of fish without injury or significant impairment to essential behavioral patterns (Bypass Zone-of-Passage Flows).

(a) *Bypass Zone-of-Passage Flows.* Within 60 days after the date this order is issued, and after consultation (as described in (i) below), the licensee shall file with the Commission, for approval, an amendment to the Comprehensive Operations and Flow Plan (as approved by the Commission on June 24, 2001 (103 FERC ¶ 62,178) (COFP)) to provide for the release of flows into the bypassed reach, when the fish lifts are operational (as described in (a)(2) below), of an amount that ensures the safe and successful passage of diadromous fish (including the federally and state endangered shortnose sturgeon, when such passage is determined to be appropriate, as described below) and resident fish (when such passage is determined to be necessary, as described below), without injury or significant impairment to their essential behavioral patterns. All flows into the bypassed reach shall be correlated to the Texon Gage. The following provisions shall achieve that goal:

(1) A provision for the release of flows to the bypassed reach sufficient to achieve the water surface elevations in the bypassed reach which correspond to the 1997 Barnes & Williams IFIM Study of 1,300-cfs flow, as measured in the bypassed reach. Flows achieving a water surface elevation of 62.85 +/- 0.1 feet National Geodetic Vertical Datum (NGVD) at the Texon Gage (as defined in (a)(3) below) satisfy this requirement;

(2) A provision stipulating that the fish lifts at the Project shall be operational for the period April 1 through November 15 of each year, as refined by U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NOAA Fisheries), Massachusetts Division of Fisheries and Wildlife (Massachusetts DFW), Massachusetts Department of Environmental Protection (Massachusetts DEP) on an annual basis; provided, however, that the fish lifts shall not be operational during the period July 15 through September 15 until such time as: (A) NOAA Fisheries determines that upstream passage of the federally and state endangered shortnose sturgeon over the dam is appropriate; or (B) Massachusetts DFW and FWS determine that resident fish passage is necessary; and

(3) A provision describing the Texon Gage as the benchmark to measure water surface elevations for the purposes of determining the Bypass Habitat Flows and the Bypass Zone-of-Passage Flows through: (A) the correlation of NGVD elevations to the readings on the existing Texon Staff Gage (located on the Texon Building); (B) the use of NGVD elevations as confirmed on an electronic gage to be located adjacent to the Texon Building; or (C) the use of an equivalent mechanism for determining NGVD elevations in the future as agreed to by the licensee and the resource agencies in consultation pursuant to paragraph (i) below.

(b) *Bypass Habitat Flows.* Within 60 days after the date this order is issued, and after consultation (as described in (i) below), the licensee shall file

with the Commission, for approval, an amendment to the COFP to provide for the release of flows into the bypassed reach, when the fish lifts are not operational (as described in (a)(2) above), of an amount that ensures an adequate water level in all bypassed channels for fish habitat and that protects the federally and state endangered shortnose sturgeon from injury, stranding, or significant impairment to their essential behavioral patterns. All flows into the bypassed reach shall be correlated to the Texon Gage. The following provisions shall achieve that goal:

(1) A provision for Interim Bypass Habitat Flows for the release of flows to the bypassed reach sufficient to achieve the water surface elevations in the bypassed reach which correspond to the 1997 Barnes & Williams IFIM Study of 840 cfs flow, as measured in the bypassed reach. Flows achieving a water surface elevation of 62.3 +/- 0.1 feet NGVD at the Texon Gage [as defined in (a)(3) above] satisfy this requirement; and

(2) A plan to establish Permanent Bypass Habitat Flows for normal operations and maintenance conditions at the Project based on the Interim Bypass Habitat Flows adjusted and modified based on flow demonstrations performed for normal operating conditions (*i.e.*, with releases through the Bascule Gate) and for maintenance conditions (*i.e.*, with releases through Rubber Dam Section No. 1 (section at South Hadley end of dam), when the Bascule Gate is out of service): (A) the evaluation of water surface elevations and the distribution of flows in the bypassed reach after the Spring 2004 fish passage season, and (B) determination if any channel modifications for flow distributions or changes to the Interim Bypass Habitat Flows are necessary to achieve the water surface target elevations from the 1997 Barnes and Williams study for each of the three bypassed channels in the bypassed reach to provide an adequate water level for fish habitat and to prevent any adverse impacts to the federally and state endangered shortnose sturgeon, including injury, stranding, or significant impairment to essential behavioral patterns. If it is determined that there is a need for modifications to the Holyoke (West) Channel or a need for changes to the Interim Bypass Habitat Flows, after consultation [as described in (i) below], the licensee shall file an application to amend the license for the Project to the extent required by the Commission's regulations. Any changes proposed under such an application for license amendment shall be coordinated with changes based on the modified run-of-river operations set forth under License Article 405.

(c) *Canal Minimum Flows.* Within 60 days after the date this order is issued, and after consultation (as described in (i) below), the licensee shall file with the Commission, for approval, an amendment to the COFP, as necessary, to provide for the release of seasonally-adjusted minimum flows into the canal system that include all of the following provisions:

(1) A provision for interim canal system minimum flows into the canal system, downstream of the louver bypass facility, of 400 cfs consistent with the Comprehensive Canal Operations Plan (as approved by the Commission on June 5, 2003 (103 FERC ¶ 62,130) (CCOP)) and the COFP. The licensee shall use generation records (consistent with the form and content of the filings made at the Commission for the period in question) and unit rating curves as an interim compliance measure; and

(2) The plan to establish permanent canal system minimum flow compliance measures to ensure a 400 cfs continuous minimum flow into the canal system downstream of the louver facility, as filed with the Massachusetts DEP in December 2003. The plan includes –

(A) The use of head gate openings and pond elevations to determine the quantity of flow (calculated from gate opening/discharge relationships) and flow measurements in the first level canal (using new flow measurement equipment installed in the first level canal) to ensure adequate flow distribution;

(B) The filing with the Commission and Massachusetts DEP on or before June 30 2004, of permanent compliance measures as a revision to the CCOP as necessary; and

(C) A provision that if significant modifications are made by the licensee or any other entity on the canal, after establishment of the permanent canal system minimum flows, that could change leakage or the distribution of flow in the canal system, the licensee shall evaluate the magnitude and distribution of flows in the canal system. Then, in consultation [as described in (i) below], the licensee shall file a proposed revision to the permanent canal system minimum flow compliance measures contained in the CCOP as necessary to achieve the resource management objectives and the minimum flow requirements set forth in this License Article and agreed to by the resource agencies and other parties [pursuant to consultation as described in (i) below].

(d) *Canal System Outage Procedures.* Within 60 days after the date this order is issued, and after consultation (as described in (i) below), the licensee shall file with the Commission for approval an amendment to the COFP, as necessary, to provide canal system drawdown procedures and operation of weirs in the canal to protect and enhance mussel species including the federally and state listed endangered dwarf wedgemussel and the state listed endangered yellow lampmussel as follows:

(1) To provide interim canal system outage procedures that provide for:

(A) Maintenance of minimum flows through the headgates sufficient to ensure that the pool between Boatlock and Riverside remains at an elevation equal to the Riverside Station intake sill elevation and at ambient river temperature throughout the drawdown period;

(B) Maintenance of sufficient flows from the Project headgates to provide water in the first level canal (once maintenance is completed) to protect the state listed endangered yellow lampmussel at the lower end of the louvers;

(C) Keeping the No. 3 Overflow closed until the end of the canal system outage period, at which time it may be opened for inspection and maintenance;

(D) Maintenance of measures for the protection of mussels if heavy machinery is used in the canal during the canal system outage period;

(E) A plan for evaluation of the experimental weir in the first level canal to determine if it retains water and develop and implement plans to modify as required; and

(F) A plan to evaluate the need for additional weirs to keep mussel habitat areas watered.

(2) To provide permanent canal system outage procedures that stipulates the following:

(A) Based on the evaluations of the Spring and Fall 2004 canal system outages, the licensee shall consult pursuant to (i) below to modify the interim canal system outage procedures (including the drawdown procedures, experimental weir, and any additional weirs) to the extent necessary to protect and enhance mussel species including the federally and state listed endangered dwarf wedgemussel and the state listed endangered yellow lampmussel, and to generally ensure sufficient flows into the canal system during the outages for the protection and enhancement of water quality and aquatic and fisheries resources;

(B) On or before January 31, 2005, the licensee shall file with the Commission, for approval as an amendment to the CCOP, a permanent canal system outage plan for canal drawdowns that addresses the following: Provisions implemented in the Spring and Fall 2004 canal system outage [as stated in (d)(2)(A) above], the evaluation and potential installation of a permanent weir in 2005 and/or additional weirs as necessary, and an update of the matters addressed in the interim canal system outage procedures;

(C) The licensee shall notify all canal water users and FWS, NOAA Fisheries, Massachusetts DEP, Massachusetts DFW, Trout Unlimited, and the Connecticut River Watershed Council prior to any canal system outage; and

(D) The licensee shall implement the plan as approved by the Commission.

(e) *Flow Prioritization.* The licensee shall operate the Holyoke Project according to the following flow prioritization plan:

Minimum Project Flow Prioritization During Fish Passage		
Priority	Spring Passage	Fall Passage
1	Canal to 400 cfs (plus 150 cfs for louvers)	Canal to 400 cfs (plus 150 cfs for louvers)
2	Bypassed Reach Habitat Flows	Bypassed Reach Habitat Flows
3	Fishway Attraction Water up to 440 cfs	Fishway Attraction Water up to 440 cfs
4	Bypassed Reach Zone-of-Passage Flows	Bypassed Reach Zone-of-Passage Flows
5	Hadley Falls Unit 1	Hadley Falls to capacity, as long as canal has at least 3,000 cfs
6	Canal to 2,000 cfs	
7	Hadley Falls to capacity	

The licensee shall file any proposed modification to that flow prioritization plan as a proposed revision to the COFP after consultation [as described in (i) below].

(f) *Monitoring.* The licensee shall specify the methods for operating and releasing bypassed reach and canal system minimum flows and shall monitor compliance with the minimum flows, as required by License Article 407.

(g) *Emergencies.* Releases from the Holyoke Project may be temporarily modified if required by operating emergencies, so long as the emergency is beyond the control of the licensee, is not reasonably foreseeable, and could not have been avoided by the exercise of due care by the licensee. Further, releases may be temporarily modified because of an emergency for short periods upon mutual agreement between the licensee, the FWS, NOAA Fisheries, Massachusetts DEP, and Massachusetts DFW. If the flows are so modified, the

licensee shall notify the Commission, FWS, NOAA Fisheries, Massachusetts DEP and Massachusetts DFW in advance if knowable or in advance or as soon as possible otherwise, but no later than 24 hours after each such incident, and shall provide the reason for the modified flow.

(h) *Changes.* If the information reported pursuant to this License Article indicates that a different flow regime is needed to protect and enhance water quality or aquatic and fisheries resources in the Project vicinity of the Connecticut River, the Commission may require such changes.

(i) *Consultation with resource agencies and other parties.* The licensee shall follow the consultation process described in License Article 420, and shall distribute all reports to the resource agencies and other parties listed in that Article.

Article 407. *Comprehensive Operations and Flow Plan.*

(a) The licensee shall implement the Comprehensive Operations and Flow Plan as approved by the Commission on June 24, 2003 (103 FERC ¶ 62,178) (COFP), including run-of-river operation, bypass flows, and fish passage operational flows.

(b) With respect to any proposed modifications to the COFP, the licensee shall follow the consultation process described in License Article 420.

(c) The Commission reserves the right to require changes to any proposed modifications to the COFP. Construction of any flow release mechanism(s) or structure(s) shall not begin until the Commission notifies the licensee that the proposed modifications to the COFP are approved. The licensee shall implement the modified COFP as approved by the Commission, including any changes required by the Commission. Any flow release mechanism(s) or structure(s) constructed by the licensee shall be shown on the as-built drawings filed pursuant to License Article 303 of this license.

(d) If the information reported pursuant to License Articles 404, 408, and 410 indicates that a different flow regime or method of achieving the flow regime is necessary to provide adequate protection and enhancement of water quality or aquatic and fisheries resources in the Project vicinity of the Connecticut River, the Commission may require such changes.

Article 408. *Holyoke Canal Operations.* The licensee shall operate the Project to protect and enhance water quality and mussel populations in the canal system.

(a) *General canal operations.* The licensee shall implement the Comprehensive Canal Operations Plan, as approved by the Commission on June 5, 2003 (103 FERC ¶ 62,130) (CCOP) [with the amendments to the CCOP contained in the Comprehensive Operations and Flow Plan, as approved by the Commission on June 24, 2003 (103 FERC ¶ 62,178)] to protect and enhance water quality and mussel populations in the canal system. With respect to any proposed modifications to the CCOP, the licensee shall consult with the resource agencies and the other parties as specified in paragraph (d) below.

(b) *Operation of the full depth louvers and exclusion racks.* The licensee shall continue to operate, clean and otherwise maintain the full depth louvers, installed in the first level of the canal system in Fall 2002 and the exclusion racks at the attraction water intake gates to ensure efficient and reliable operation of these facilities for the protection of aquatic resources. The licensee shall annually inspect the full depth louvers and exclusion racks, and repair them as necessary. In the event the full depth louver facility is out of service during the fish passage season as described in License Article 411(a)(2), the canal system shall not be operated and the headgates shall be closed to seal flows into the canal. If necessary, at the end of the fish passage season a slow drain of the canal shall be performed to return any fish to the Connecticut River. In the event of a failure of the canal louver bypass system, the licensee shall shut the canal down. If there is a structural failure of the louver panels, the licensee shall notify Massachusetts Division of Fisheries and Wildlife (Massachusetts DFW), U.S. Fish and Wildlife Service (FWS), and the National Marine Fisheries Service (NOAA Fisheries) within 24 hours, and shall implement a slow drain procedure to allow any fish in the canal downstream of the louver facility to return to the River.

(c) *Effectiveness studies of full depth louvers.* The licensee shall implement the effectiveness study plan for the full depth louvers, as they affect surface migrants, pursuant to the effectiveness study plan outlined in Section 4.3(g) of the Settlement (included as Appendix C to this license order). In consultation (as described in (d) below), the licensee shall prepare and file an effectiveness study plan for the full depth louvers, as they affect bottom migrants (as addressed in Section 4.7(c)(1)(B) of the Settlement), with the Commission and Massachusetts Department of Environmental Protection (Massachusetts DEP) on or before July 1, 2004. The effectiveness of the full depth louvers shall be evaluated based on the overall downstream fish passage goal of safely and successfully passing the fish without injury or significant impairment to essential behavioral patterns. The study results regarding facility effectiveness shall be circulated to FWS, NOAA Fisheries, Massachusetts DFW, Massachusetts DEP, Trout Unlimited, and the Connecticut River Watershed Council, and filed with the Commission and Massachusetts DEP no later than December 31 of the year of completion of the study. If, based on the louver effectiveness studies and any other relevant

information in the record of this proceeding, the licensee, the resource agencies and the other parties [in consultation as described in (d) below] determine that the full depth louvers are effective, the licensee may close the Boatlock Station Bypass.

(d) *Consultation with resource agencies and other parties.* The licensee shall follow the consultation process described in License Article 420, and will distribute all reports to the resource agencies and other parties listed in that Article.

(e) The Commission reserves the right to require changes to any proposed modification to the CCOP. The licensee shall implement the modified CCOP as approved, including any changes required by the Commission. If the results of monitoring indicate that changes in Project structures or operations are necessary to protect and enhance water quality and mussel populations in the canal system (e.g., canal operations and/or structures), the Commission may direct the licensee to modify Project structures or operations.

Article 409. *Fish and Aquatic Habitat Plan.*

(a) The licensee shall implement the Fish and Aquatic Habitat Plan, as approved by the Commission on June 24, 2003 (103 FERC ¶ 62,175), to monitor fish and aquatic habitat and fish populations within the bypassed reach and the Holyoke canals. The licensee shall propose to modify the plan, if necessary, based on the 2003 and 2004 canal system outages and to track the 12-year plan in the Fish and Aquatic Habitat Plan (as addressed in Section 4.11(e) of the Settlement). In addition, the licensee shall implement the provision of the Comprehensive Canal Operations Plan, as approved by the Commission on June 5, 2003 (103 FERC ¶ 62,130), with respect to monitoring of canal mussel populations.

(b) The licensee shall follow the consultation process described in License Article 420 with respect to any proposed modifications to, or reporting, under the Fish and Aquatic Habitat Plan.

(c) The Commission reserves the right to require changes to any proposed modifications to the Fish and Aquatic Habitat Plan. Implementation of the modified plan shall not commence until the Commission notifies the licensee that the filing is approved. The licensee shall implement the modified plan as approved by the Commission, including any changes required by the Commission.

(d) If the results of the monitoring plan indicate that changes in Project structures or operations [including any measures identified by the licensee, the resource agencies and the other parties in consultation as described in (b) above]

are necessary to protect aquatic and fisheries resources, the Commission may direct the licensee to modify Project structures or operations accordingly.

Article 410. *Downstream Fish Passage Facilities.* The licensee shall install, operate, and maintain downstream fish passage facilities at the Holyoke Project that safely and successfully pass diadromous and resident fish without injury or significant impairment to essential behavioral patterns. The licensee shall further implement and enhance downstream fish passage in several phases as described below. The downstream fish passage facilities are to be designed, constructed and operated to: (i) prevent entrainment or impingement in the Project intake system, (ii) prevent injury to fish if passed over or through the dam onto the spillway, and (iii) ensure that all downstream migrating diadromous and resident fish that appear on the upstream side of the dam shall be passed downstream without injury or significant impairment to essential behavioral patterns.

Operational deadlines for new downstream fish passage facilities shall depend on whether Phase 2A or Phase 2B is implemented, as determined by the licensee in consultation with the resource agencies [U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NOAA Fisheries), Massachusetts Division of Fisheries and Wildlife (Massachusetts DFW), and Massachusetts Department of Environmental Protection (Massachusetts DEP)] and other parties [Trout Unlimited (TU) and the Connecticut River Watershed Council (Watershed Council)] pursuant to (c) below. If, in consultation with the resource agencies, the licensee implements Phase 2A, then the complete downstream passage facilities shall be operational no later than April 1, 2010, although the licensee shall provide interim (and potentially long-term) facilities to prevent entrainment and impingement in the intake system by April 1, 2006. If, in consultation with the resource agencies, the licensee implements Phase 2B, then the complete downstream passage facilities shall be operational no later than April 1, 2009. Regardless of the Phase implemented, the licensee shall monitor effectiveness of the facilities and make additional improvements as provided for below.

(a) *Downstream fish passage.* The licensee shall implement the Downstream Fish Passage Plan as approved by the Commission on June 19, 2003 (103 FERC ¶ 62,165), to cover the operation, maintenance, and evaluation of the existing downstream fish passage facilities at the Holyoke Project until modification of that plan is authorized by the Commission under paragraph (b) below. With respect to any proposed modifications to the Downstream Fish Passage Plan, the licensee shall consult with the resource agencies and the other parties as specified in paragraph (c) below.

(b) *Downstream fish passage enhancements* – Within 60 days after the date this order is issued, and after consultation [as described in (c) below and in

Article 420], the licensee shall file with the Commission and Massachusetts DEP, for approval, a plan to enhance the existing downstream fish passage facilities at the Holyoke Project that includes:

(1) *Phase 1 – 2004-2005.* During the period 2004 through 2005, in consultation with the agencies and other parties pursuant to paragraph (c) below, the licensee shall implement modifications to the Downstream Sampling Facility; shall potentially implement modifications to the Louver Bypass Discharge Pipe (as set forth below); shall implement operational changes to prioritize flows from the Hadley Falls units to the canal during Fall evening hours; and shall conduct research and studies (as set forth below). Based on such research, on or before December 31, 2005, the licensee [in consultation pursuant to paragraph (c) below], shall determine whether to implement Phase 2A or Phase 2B (as described below in paragraphs (c) and (d) below). The Phase 1 work shall include:

(A) To minimize the potential for injury to federally and state endangered shortnose sturgeon if they enter the Downstream Sampling Facility, after initial consultation pursuant to paragraph (c) below, the licensee shall develop a plan to modify the Downstream Sampling Facility with such modifications to be completed by April 15, 2004, and to test the effectiveness of such modifications thereafter in 2004. The plan shall be filed with the Commission and Massachusetts DEP on or before March 1, 2004. The licensee shall implement the plan as approved in writing by the Commission. If, after such modifications, evidence of injury to shortnose sturgeon is found, the licensee shall consult with the resource agencies and other parties pursuant to paragraph (c) below to determine if any additional modifications are appropriate. The licensee shall operate the Downstream Sampling Facility in accordance with the Downstream Sampling Facility Operating Protocol, attached as Appendix D to this license order.

(B) The licensee shall evaluate the effect of the height of the drop from the Louver Bypass Discharge Pipe to the tailrace on shortnose sturgeon through a radio tracking study. If, in consultation pursuant to paragraph (c) below, the licensee determines it is necessary to reduce the height of the drop from the Louver Bypass Discharge Pipe to the tailrace to enhance the survival of shortnose sturgeon, the licensee shall propose how best to modify the Louver Bypass Discharge Pipe in a plan to be filed [after consultation pursuant to paragraph (c) below] that provides for such modifications to be implemented in 2005, to be operational for the Spring 2006 Upstream Passage Season, and effectiveness testing of the modifications in 2006 after the modifications are implemented. The licensee shall file the plan with the Commission and Massachusetts DEP on or before April 1, 2005, and shall implement the plan as approved in writing by the Commission.

(C) To reduce entrainment, the licensee shall develop a plan [in consultation pursuant to paragraph (c) below] to change flow prioritization from the Hadley Falls units to the Canal during nighttime periods from October 1 through the later of: (i) the time when the River temperature reaches 5° C., or (ii) November 30 [unless the resource agencies and other parties, in consultation pursuant to paragraph (c) below, agree to an earlier time], with prioritizing the Canal first and then regulating the Hadley Falls Station. The licensee shall file the plan with the Commission and Massachusetts DEP on or before December 31, 2004, and shall implement the plan as approved in writing by the Commission. The licensee shall also consult with the resource agencies and other parties [pursuant to paragraph (c) below] to determine if additional or alternative operational changes will enhance downstream passage.

(D) In consultation pursuant to paragraph (c) below, the licensee shall conduct a Louver Field Study in 2004: (i) to evaluate effectiveness of the full depth louvers to guide shortnose sturgeon and American eels; and (ii) to evaluate the behavior of shortnose sturgeon and American eels at the ramp and the entrance to the bypass pipe.

(E) In consultation pursuant to paragraph (c) below, the licensee shall conduct CFD Modeling in 2004: (i) of the Hadley Falls unit's intakes to evaluate the potential of modifying the existing Hadley Falls unit's intake racks to be an effective interim (and potentially long term device to prevent entrainment and impingement of fish at the Hadley Falls; and (ii) of a potential bottom weir to evaluate if such a weir would produce flow patterns conducive to guide bottom migrants into the Canal.

(F) In consultation pursuant to paragraph (c) below, the licensee shall conduct a USGS Flume Study in 2004: (i) to determine the swimming depth and behavior of yearling, juvenile and adult shortnose sturgeon at a bar rack structure; (ii) to determine the threshold velocity for avoidance of impingement/entrainment of yearling, juvenile, and adult shortnose sturgeon at conditions present at the proposed modified Hadley Falls intake racks with 2-inch spacing; and (iii) to determine if yearling, juvenile, and adult shortnose sturgeon can avoid impingement/entrainment at conditions present at a potential alternative bar rack facility (2-inch spacing and velocities of 2 fps).

(G) In consultation pursuant to paragraph (c) below, the licensee shall conduct a USGS Flume Study in 2005: (i) to determine how shortnose sturgeon would respond to a bottom weir for guidance; and (ii) to determine how shortnose sturgeon would respond to a bypass entrance, integral with a rack structure.

(H) In consultation pursuant to paragraph (c) below, the licensee shall conduct a Bascule Gate and Rubber Dam Section No. 5 Analysis (comprised of a desk-top study) in 2005: (i) to identify potential solutions to the interference of the Bascule Gate discharge on the entrance to the spillway fishway; (ii) to evaluate the feasibility of using/modifying the Bascule Gate and/or modifying the spillway in the vicinity of Rubber Dam Section No. 5 (adjacent to the Bascule Gate) to pass shortnose sturgeon, American eels and other migratory fish; and (iii) to investigate modifications to the Bascule Gate and/or the spillway in the vicinity of Rubber Dam Section No. 5 to safely and successfully pass the fish without injury or significant impairment to essential behavioral patterns down the spillway and over the apron into the Bypassed Reach.

(I) In consultation pursuant to paragraph (c) below, the licensee shall conduct an Eel Study in 2004 to determine the timing of migration of silver-phase American eels at the Project.

(J) In consultation pursuant to paragraph (c) below, the licensee shall conduct a Spawning Study in 2005 to identify potential spawning sites for shortnose sturgeon downstream of the Dam.

(2) *Decision Point – 2005.* Based on the results of the Phase 1 research, on or before September 30, 2005, the licensee shall distribute to the resource agencies and other parties [as provided in paragraph (c) below] a recommendation on whether to implement Phase 2A or Phase 2B, as described below. The licensee shall implement Phase 2A as set forth in paragraph (b)(3) below if: (i) the results of the Phase 1 studies (described above) demonstrate that the licensee can modify the existing Hadley Falls intake racks to be an effective interim (and potentially long term) exclusion device while achieving the threshold velocity for avoidance of entrainment and impingement of fish; and (ii) there is a potential solution to the Bascule Gate discharge interference on the spillway fishway and a means of providing safe passage down the spillway and over the apron have been identified. If the two elements (i) and (ii) above are not confirmed by the FWS, NOAA Fisheries, Massachusetts DEP and Massachusetts DFW pursuant to the process described below, then the licensee shall implement Phase 2B.

The process for determining whether the licensee implements Phase 2A or Phase 2B shall be as follows: After circulation by the licensee of the study results and the licensee's recommendation for Phase 2A or Phase 2B, the licensee shall consult pursuant to paragraph (c) below. On or before December 31, 2005, FWS, NOAA Fisheries, Massachusetts DEP and Massachusetts DFW are to notify the licensee if they all agree with the licensee's recommendation; in which case, the licensee shall implement that recommendation. If FWS, NOAA Fisheries, Massachusetts DEP and Massachusetts DFW do not all agree with the licensee's

recommendation, they are to notify the licensee by December 31, 2005, and the licensee shall then implement Phase 2B.

(3) *Phase 2A – 2006-2010.* Based on the Phase 1 research, consistent with the decision made pursuant to paragraph (b)(2) above, and in consultation pursuant to paragraph (c) below, the licensee shall implement the work and research as outlined below for further enhancements of the downstream fish passage facilities. Under Phase 2A the licensee shall: (i) continue to implement operational changes commenced in 2005 to enhance downstream passage of shortnose sturgeon; (ii) construct and install an interim (and potentially long term) device by the end of 2006 that prevents entrainment and impingement at the Project based on modifications of the Hadley Falls intake racks and installation of a new trash rake structure connected with the intake racks; (iii) prepare a functional design drawing of the selected option to modify the Bascule Gate to safely and successfully pass fish without injury or significant impairment to essential behavioral patterns and to solve interference of Bascule Gate discharge on the spillway fishway, then build a prototype and field test (if necessary) in 2006, with engineering/permitting in 2007 and construction in 2008; (iv) undertake additional research during the period 2006 to 2010 to ensure that the downstream passage facilities are effective for exclusion and safe and successful passage of fish over the dam; (v) design, engineer, and permit in 2008: (A) an alternative exclusion and (B) an alternative passage device in the vicinity of Rubber Dam Section No. 5 (if the modifications to the Hadley Falls intake racks are determined not to be successful as a long-term exclusion device), to safely and successfully pass fish without injury or significant impairment to essential behavioral patterns, with construction of these facilities completed in 2009, and with the start of effectiveness testing of these facilities in 2010; and (vi) implement a long-term monitoring program for shortnose sturgeon from 2011 to the end of the Project License. The specific schedule is as follows:

2006

- The licensee shall design, engineer, permit, build and complete the modifications to existing Hadley Falls intake racks and installation of a new trash rake structure, as agreed to at the Decision Point 2005 above, as an exclusion device for downstream migrating fish including shortnose sturgeon to prevent entrainment and impingement at the Hadley Falls intakes. The modifications to the Hadley Falls intake racks and the installation of the new trash rake shall be completed by the end of 2006 (or earlier if possible depending on River conditions and obtaining necessary permits).
- The licensee shall continue to implement operational changes commenced in 2005.

- The licensee shall prepare a functional design drawing of the selected option to modify the Bascule Gate for safe passage and to solve interference of Bascule Gate discharge on spillway fishway; build prototype and field test (if necessary).
- The licensee shall conduct effectiveness studies of the modifications to the Louver Bypass Discharge Pipe if implemented in 2005, and shall distribute the results to the resource agencies and other parties pursuant to paragraph (c) below.
- The licensee shall perform radio tracking studies of shortnose sturgeon and silver-phase American eels, and shall distribute the results to the resource agencies and other parties pursuant to paragraph (c) below.

2007

- The licensee shall engineer, design and permit modifications to the Bascule Gate to provide safe and successful passage for the fish without injury or significant impairment to essential behavioral patterns and to solve the interference of Bascule Gate discharge on the spillway fishway.
- The licensee shall continue to perform radio tracking studies of shortnose sturgeon and use such studies to evaluate the effectiveness of the modifications to the Hadley Falls intake racks completed in 2006; shall continue to perform radio tracking studies of silver-phase American eels, if necessary; and shall distribute the results to the resource agencies and other parties pursuant to paragraph (c) below.

2008

- The licensee shall provide to the resource agencies and other parties (consulted pursuant to paragraph (c) below) the results of the effectiveness testing of the modifications to the Hadley Falls intake racks and other measures in 2006-2007, and the licensee's conclusion whether those modifications and other measures achieve the goals for Phase 2A as stated above. Based on that information the licensee, in consultation with the resource agencies and other parties (through the decisional process described in Appendix F, Part III, Decision Point – 2005, of the Settlement), shall determine if it is necessary to build an alternative exclusion device
 - If (through the decisional process described in Appendix F, Part III, Decision Point – 2005, of the Settlement) the resource agencies (FWS, NOAA Fisheries, Massachusetts DEP and Massachusetts DFW) determine that it is not necessary for the licensee to build an alternative exclusion device, then the licensee shall design, engineer, permit and construct the modifications to the Bascule Gate, for fish passage.

- If (through the decisional process described in Appendix F to the Settlement) the resource agencies (FWS, NOAA Fisheries, Massachusetts DEP and Massachusetts DFW) determine that it is necessary for the licensee to build an alternative exclusion and passage device(s), then the licensee shall design, engineer and permit: (i) an alternative exclusion device, and (ii) an alternative passage device (in the vicinity of Rubber Dam Section No. 5), as determined by the resource agencies and other parties (in consultation pursuant to paragraph (c) below) that would not only exclude fish from the Hadley Falls intakes without impingement, but would also provide for safe and successful downstream passage of fish without injury or significant impairment to essential behavioral patterns.
- The licensee shall continue to perform radio tracking studies of shortnose sturgeon, and distribute results to the resource agencies and other parties pursuant to paragraph (c) below.
- The licensee shall conduct a Population Survey for shortnose sturgeon in the Connecticut River, from Long Island Sound to Turners Falls (as described more fully in Appendix F to the Settlement Agreement and Appendix E to this license order), and distribute the results to the resource agencies and other parties pursuant to paragraph (c) below.

2009

- As determined to be necessary in 2008, the licensee shall bid, build and complete construction of device(s) designed and permitted in 2008 (in consultation with the resource agencies and other parties pursuant to paragraph (c) below).
- The licensee shall continue radio tracking studies of shortnose sturgeon and distribute the results to the resource agencies and other parties pursuant to paragraph (c) below.

2010

- The licensee shall commence operation of the device(s) constructed in 2009 prior to April 1, 2010.
- The licensee shall, in consultation pursuant to paragraph (c) below, develop a plan to study the effectiveness of the exclusion and passage device(s) completed in 2008-2009; shall implement that plan; and shall distribute the results to the resource agencies and other parties by January 31, 2011, pursuant to paragraph (c) below.

- The licensee shall consult [pursuant to paragraph (c) below] to develop long-term monitoring protocol for shortnose sturgeon during the term of the License for the Project, with distribution of the results annually to the resource agencies and other parties pursuant to paragraph (c) below. If after 2010 the licensee determines, in consultation pursuant to paragraph (c) below, that shortnose sturgeon are not passing safely downstream of the Project, the licensee shall consult further with the resource agencies and other parties pursuant to paragraph (c) below to determine a plan for re-evaluating the downstream passage facilities.

Plans to implement each part of Phase 2A above shall be prepared and submitted to the resource agencies and other parties pursuant to paragraph (c) below. The licensee shall consult with the resource agencies and other parties, and/or obtain the concurrence and/or approval of that plan, pursuant to paragraph (c) below. Thereafter, the licensee shall file such plans with the Commission and Massachusetts DEP, and shall implement such plans as approved in writing by the Commission.

(4) *Phase 2B – 2006-2009.* Based on the Phase 1 research, consistent with the decision made pursuant to paragraph (b)(2) above, and in consultation pursuant to paragraph (c) below, the licensee shall implement the work and research as outlined below for further enhancements of the downstream fish passage facilities. Under Phase 2B the licensee shall: (i) continue to implement operational changes commenced in 2005 to enhance downstream passage of shortnose sturgeon; (ii) continue studies and research to determine the appropriate alternative exclusion and passage device(s), including an angled bar rack; (iii) design/permit measures and modifications in 2007 for: (A) an alternative exclusion device, and (B) an alternative passage device (in the vicinity of Rubber Dam Section No. 5) to safely and successfully pass fish without injury or significant impairment to essential behavioral patterns and avoid any potential flow interference problems with the spillway fishway, construct these facilities in 2008, and start effectiveness testing of these facilities in 2009; (iv) undertake additional research and additional measures from 2006 to 2009 to ensure that the downstream passage facilities are effective for exclusion and guidance as described below; and (v) implement a long-term monitoring program for shortnose sturgeon from 2010 to the end of the Project License. The specific schedule is as follows:

2006

- The licensee shall perform a full feasibility study of options for an alternative passage device (in the vicinity of Rubber Dam Section No. 5) to: (i) safely and successfully pass the fish without injury or significant impairment to essential behavioral patterns down the spillway over the apron and into the Bypassed Reach, and (ii) avoid any potential flow interference problems with the spillway fishway. Build prototype and field test (if necessary).

- The licensee shall continue to implement operational changes commenced in 2005.
- The licensee shall consult pursuant to paragraph (c) below to develop a research and study program to evaluate alternative exclusion and passage device(s).
- The licensee shall perform radio tracking studies of shortnose sturgeon and silver-phase American eel; and shall distribute the results to the resource agencies and other parties pursuant to paragraph (c) below.
- The licensee shall conduct effectiveness studies of the modifications to the Louver Bypass Discharge Pipe if performed in 2005, and shall distribute the results to the resource agencies and other parties pursuant to paragraph (c) below.

2007

- In consultation with the resource agencies and other parties pursuant to paragraph (c) below, the licensee shall design/engineer/permit: (i) an alternative exclusion device and (ii) an alternative passage device (in the vicinity of Rubber Dam Section No. 5), determined in 2006 by the licensee, the resource agencies and the other parties (in consultation pursuant to paragraph (c) below) to safely and successfully pass the fish without injury or significant impairment to essential behavioral patterns down the spillway over the apron and into the Bypassed Reach, avoiding any potential flow interference problems with the spillway fishway, that would not only exclude fish from the Hadley Falls intakes without impingement, but also provide for safe and successful downstream passage of migratory and resident fish.
- The licensee shall continue to implement operational changes commenced in 2005.
- The licensee shall continue radio tracking studies of shortnose sturgeon, and shall distribute the results to the resource agencies and other parties pursuant to paragraph (c) below.

2008

- As designed and permitted in 2007, in consultation with the resource agencies and other parties pursuant to paragraph (c) below, the licensee shall bid, build and complete construction of: (i) the alternative exclusion device, and (ii) the alternative passage device.

- The licensee shall continue to implement operational changes commenced in 2005.
- The licensee shall continue radio tracking studies of shortnose sturgeon and shall distribute the results to the resource agencies and other parties pursuant to paragraph (c) below.
- The licensee shall conduct a Population Survey for shortnose sturgeon in the Connecticut River, from Long Island Sound to Turners Falls (as described more fully in Appendix F to the Settlement Agreement and in Appendix E to this license order), and distribute the results to the resource agencies and other parties pursuant to paragraph (c) below.

2009

- The licensee shall commence operation of the device(s) constructed in 2008 prior to April 1, 2009.
- The licensee shall, in consultation pursuant to paragraph (c) below, develop a plan to study the alternative exclusion and passage devices completed in 2008; shall implement the plan; and shall distribute the study results to resource agencies and other parties by January 31, 2010, pursuant to paragraph (c) below.
- The licensee shall consult resource agencies and other parties pursuant to paragraph (c) below to develop long-term monitoring protocol for shortnose sturgeon during the term of the License for the Project, with distribution of the results annually to the resource agencies and other parties pursuant to paragraph (c) below. If after 2009 the licensee determines, in consultation pursuant to paragraph (c) below, that shortnose sturgeon are not passing safely downstream of the Project, the licensee shall consult further with the resource agencies and other parties pursuant to paragraph (c) below to determine a plan for re-evaluating the downstream passage facilities.

Plans to implement each part of Phase 2B above shall be prepared and submitted to the resource agencies and other parties pursuant to paragraph (c) below. The licensee shall consult with the resource agencies and other parties, and/or obtain the concurrence and/or approval of that plan, pursuant to paragraph (c) below. Thereafter, the licensee shall file such plans with the Commission and Massachusetts DEP, and shall implement such plans as approved in writing by the Commission.

(c) *Consultation and the filing of plans.* The licensee shall follow the consultation process described in License Article 420.

(d) The Commission reserves the right to require changes to any plan filed. Implementation of any provision outlined in a plan shall not commence until the Commission notifies the licensee that the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission. Any structure built in accordance with a plan shall be shown on the as-built drawings filed pursuant to License Article 303.

Article 411. *Upstream Fish Passage Facilities.* The licensee shall install, operate, and maintain upstream fish passage facilities at the Holyoke Project that ensure that all upstream migrating diadromous and resident fish are able to safely and successfully pass upstream of the Project without injury or significant impairment to essential behavioral patterns. Upstream passage shall include the federally and state endangered shortnose sturgeon and resident fish only when the resource agency(ies) determines it is necessary or appropriate as described more fully below. The licensee shall implement and enhance upstream fish passage as outlined in Phase 1 and Phase 2A/2B described below.

(a) *Upstream fish passage – Phase 1.* Within 60 days after the date of this order (as described in License Article 420), and after consultation [as described in (e) below], the licensee shall file with the Commission and the Massachusetts Department of Environmental Protection (Massachusetts DEP), for approval, an amendment to the Upstream Fish Passage Plan as approved by the Commission in an order issued on June 24, 2003 (103 FERC ¶ 62,177), and amended on March 18, 2004 (106 FERC ¶ 62,213), to cover the operation, maintenance, and evaluation of the existing upstream fish passage facilities (including the enhancements completed since issuance of the 1999 License Order) at the Holyoke Project that includes:

(1) The upstream passage facilities listed as including: (A) the attraction water system; (B) the tailrace entrance and lift tower; (C) the spillway entrance and lift tower; (D) the spillway transport channel; (E) the entrance flume with the fish trapping and viewing station; (F) the exit flume; (G) trapping and hauling system; and (H) the fish exit channel.

(2) The following enhancements already performed to the upstream passage facilities (completed after issuance of the 1999 License Order) listed as including: (A) modification of the gate insert in the west tailrace entrance to improve flows for fish passage; (B) modifications to the Holyoke (West) Channel in the bypassed reach to reduce stranding of upstream migrants; (C) improvement to the “V Gate” in the tailrace entrance gallery to reduce shad milling; and (D) increased elevation of the area above the Hadley Falls Station draft tubes to provide for operation up to 40,000 cfs river flow.

(3) The continued operation of the tailrace and spillway fish lift facilities, as described herein during the Upstream Passage Season (to be defined as from April 1 through November 15 of each year), as refined by the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NOAA Fisheries), Massachusetts DEP and the Massachusetts Division of Fisheries & Wildlife (Massachusetts DFW) on an annual basis; provided, however, that the fish lifts shall not be operational for the period from July 15 to September 15 of each year until such time as: (A) NOAA Fisheries determines that upstream passage of shortnose sturgeon over the Dam is appropriate; or (B) Massachusetts DFW and FWS determine that resident fish passage is necessary. The specific dates and hours of operation of the fish lifts during these periods would be determined by Massachusetts DFW in consultation with the licensee, in accordance with Condition 14(d) of the Water Quality Certification issued by Massachusetts DEP in February 2001, and in consultation with NOAA Fisheries once upstream passage of shortnose sturgeon is implemented;

(4) A provision that, except for Fall 2004, the licensee not interrupt fish lift operations during the Upstream Passage Season; and a functioning trap for salmon and the ability to trap and truck shad is available during the Upstream Passage Season before and after construction in 2004;

(5) A provision that when shortnose sturgeon appear at the fish lift facilities but are not to be lifted, the licensee follow the Shortnose Sturgeon Handling Plan (attached as Appendix F to this license order);

(6) A provision that the licensee implement measures and procedures to operate the No. 2 Overflow in such a manner to avoid releasing water during Upstream Passage Season when the fish lifts are operational pursuant to the No. 2 Overflow Procedures (attached as Appendix G to this license order);

(7) Provisions for: (A) maintaining the fish passage facilities in proper order and keeping such facilities clear of trash, logs, and material that would hinder passage; (B) performing maintenance such that the fish passage facilities would operate effectively prior to and during the Upstream Passage Season; and (C) developing a fish passage maintenance plan describing the anticipated maintenance, a maintenance schedule, and contingencies; and

(8) A provision to allow agency personnel access to the project site and to pertinent project records, for the purpose of inspecting the fish passage facilities.

(b) *Upstream fish passage – Phase 2.* Within 90 days after the date this order is issued, and after consultation (as described in (e) below and in Article 420), the licensee shall file with the Commission and Massachusetts DEP, for

approval, a plan to enhance the existing upstream fish passage facilities at the Holyoke Project that includes:

(1) Completion of the installation of the following improvements by the Spring 2005 Upstream Passage Season, with development of final detailed plans and schedule in consultation [as described in (e) below], and submittal of final detailed plans and schedule to the Commission for approval:

(A) Replacement of the tailrace lift tower, auxiliary equipment and hopper to accommodate 33 cubic feet per minute capacity;

(B) Replacement of the spillway tower, auxiliary equipment and hopper to accommodate 46 cubic feet per minute capacity;

(C) Increase of the width of the spillway transport channel to an average width of 6 feet;

(D) Modifications to the exit flume to accommodate the new spillway lift location;

(E) Increase of the width of the fish exit channel up to a maximum of 14 feet between the lift towers and the fish counting station;

(F) Installation of a high capacity adjustable drain valve in the flume;

(G) Addition of a second fish trap and viewing window in the exit flume;

(H) Expansion of the fish counting station to include both fish traps;

(I) Modification of the fish trapping and hauling system to improve the work area and minimize hoisting and netting of fish; and

(J) Modification of the attraction water supply system to provide up to 200 cfs at the spillway entrance and 120 cfs at each of the tailrace entrances.

(2) A schedule that provides for construction to begin in 2004 and be completed prior to the start of the Spring 2005 Upstream Passage Season;

(3) Milestones to identify target completion dates for key components to ensure compliance with Spring 2005 Upstream Passage Season requirements; and

(4) Contingency plans for unexpected delays in construction. If, by November 1, 2004, it is determined that the licensee would not meet the start of the operation of the fish lifts pursuant to (a)(1) above, or the planned construction is substantially

behind schedule, then the licensee shall promptly consult with the resource agencies and other parties (no later than November 30, 2004) to develop and agree on alternatives for fish lift operations for the Spring 2005 Upstream Passage Season.

(c) *Effectiveness testing of upstream fish passage facilities.* The licensee shall evaluate and monitor the effectiveness of the upstream fish passage facilities for diadromous and resident fish as follows:

(1) On or before September 30, 2004, the licensee shall circulate to the resource agencies and the other parties [as described in (e) below], a proposed plan for the evaluation and monitoring of the effectiveness of upstream fish passage facilities. Such plan shall include, but not be limited to, the following:

(A) Evaluation of operation and attraction flows;

(B) Evaluation of the adequacy and effectiveness of the 7-foot-wide exit channel upstream of the counting station, the existing 4.5-foot-wide spillway entrance, and the existing 6-foot-wide spillway entrance channel to provide upstream fish passage;

(C) Evaluation of the ability to achieve the target design populations for upstream fish passage at the Project (1,000,000 each for American shad and blueback herring; 6,000 for Atlantic salmon; unquantified for American eels, and an estimated 500 shortnose sturgeon); and

(D) Annual reports to be distributed to the resource agencies and other parties [as described in (e) below] by December 31st of each year.

After consultation as described in (e) below, on or before November 30, 2004, the licensee shall file that plan with the Commission and Massachusetts DEP, and shall implement the plan as approved by the Commission.

(2) By December 31, 2006, the licensee shall distribute a cumulative report of the study results of the effectiveness testing to the resource agencies and other parties [as described in (e) below], and the report shall include conclusions and recommendations as to whether the goal as stated at the first sentence of this License Article has been achieved. Within three months after distribution of the report, the licensee shall consult [as described in (e) below] with respect to the study results.

(3) If, based on the study plan and the study results described in (c)(1) and (c)(2) above, the report concludes that the upstream passage facilities and measures are

not accomplishing the objective stated above, or if the study does so conclude but Massachusetts DEP, Massachusetts DFW, FWS and/or NOAA Fisheries do not concur with the conclusions in the report, in consultation with the licensee and the other parties [as described in (e) below], the licensee shall develop plans to modify the upstream fish passage facilities including, if necessary:

(A) Increasing the width of the exit channel upstream of the counting station to 10 feet;

(B) Increasing the width of the spillway entrance to 8 feet; and/or

(C) Increasing the width of the spillway entrance channel to 8 feet.

The licensee shall circulate such plans and a schedule for the implementation of the modifications to the resource agencies and the other parties [as described in (e) below] and shall propose any modifications as a result of comments. After consultation [as described in (e) below], the licensee shall file the final plans and schedule with the Commission (in the form of an application to amend the License for the Project) and with Massachusetts DEP (for approval consistent with Condition 14(c) of the Water Quality Certification issued by Massachusetts DEP on February 14, 2001, as incorporated in Article 421) that addresses the proposed changes to fishway operations or structures determined to be necessary to protect and enhance fish passage for diadromous and resident fish. The licensee shall implement the plan as approved by the Commission.

(4) If, based on the effectiveness study results, Massachusetts DEP, Massachusetts DFW, FWS and NOAA Fisheries, in consultation with the licensee and the parties [as described in (e) below], are unable to determine whether or not the new upstream fish passage facilities are effective or what modifications are necessary to the facilities in order to meet the goal of safe and successful upstream fish passage as described above, the licensee shall extend the plan for evaluation and monitoring of the effectiveness of such facilities for diadromous and resident fish (as described in (c)(1) and (c)(2) above) for an additional year, with a report distributed to the resource agencies and other parties [as described in (e) below]. Based on the extension of the study, on or before December 31, 2007, the licensee shall prepare a cumulative report and follow the procedures in (c)(2) above. If, after this one-year extension of the study, the licensee, the resource agencies and the other parties are unable to determine whether or not the new facilities are effective or what modifications are necessary to the facilities in order to meet the goal of safe and successful upstream fish passage as described above, then the licensee shall extend or schedule additional evaluation and monitoring as determined to be needed pursuant to consultation described in (e) below.

(5) Following completion of construction under (c)(3) above, the licensee shall consult with the resource agencies and other parties [as described in (e) below] whenever necessary and as requested by the resource agencies to assess the effectiveness of the upstream fish passage facilities to pass shortnose sturgeon and other diadromous and resident, including an evaluation of the ability to achieve the target design populations for upstream fish passage as described in (c)(1)(C) above. If NOAA Fisheries, FWS, and/or Massachusetts DFW determine, based on the study results under (c)(1) above, that modifying the spillway entrance to the upstream passage facilities and/or an adjustment to the attraction flows is necessary to meet the goal of safe and successful upstream passage of shortnose sturgeon and other diadromous and resident, the licensee shall implement the modifications as directed by NOAA Fisheries, FWS and Massachusetts DFW, and as approved in writing, as necessary, by the Commission.

(d) *Annual report and monitoring of upstream fish passage facilities.* On or before January 31 of each year, the licensee shall submit to the resource agencies and other parties [as described in (e) below] and the Connecticut River Atlantic Salmon Commission a report of the previous year's activities relative to the operation of the upstream fish passage facilities [including the number of fish lifted, relative to the target design populations for upstream fish passage as described in (c)(1)(C) above and plans for the next year's activities]. The licensee shall monitor upstream passage for diadromous and resident fish including, but not limited to, counting, trapping, monitoring, and collection of biological data consistent with Condition 15 of the Water Quality Certification issued by Massachusetts DEP on February 14, 2001 (as incorporated in Article 421).

(e) *Consultation and the filing of plans.* The licensee shall follow the consultation process described in License Article 420.

(f) The Commission reserves the right to require changes to any plan filed. Implementation of any provision outlined in a plan shall not commence until the Commission notifies the licensee that the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission. Any structure built in accordance with a plan shall be shown on the as-built drawings filed pursuant to License Article 303.

Article 412. *American Eel Passage Facilities.* The licensee shall install, operate, and maintain appropriate upstream and downstream fish passage facilities at the Holyoke Project to facilitate safe and successful passage for American eels.

(a) *Interim upstream eel passage.* The licensee shall operate pursuant to the Upstream Fish Passage Plan, approved by the Commission on June 24, 2003 (103 FERC ¶ 62,177). As stated in that plan, the licensee shall do the following in

furtherance of eel passage at the Project; all activities shall be undertaken in consultation as described in (e) below:

(1) By July 1, 2004, the licensee shall: (i) construct and implement modified eel collectors on the Holyoke side of the Project; (ii) construct and install a ramp and an eel collector on the South Hadley side of the Project; (iii) move eels upstream and collect data on how upstream migrants approach the dam; and (iv) conduct a marking study to determine if backdrop is an issue; and

(2) In 2005, the licensee shall: (i) continue to move eels upstream and collect as much data as possible on how upstream migrants approach the dam; and (ii) study where to locate the entrance passage on the Holyoke side of the Project.

(b) *Permanent upstream eel passage.* The licensee shall file with the Commission and the Massachusetts Department of Environmental Protection (Massachusetts DEP) on or before March 31, 2006, a permanent upstream eel passage plan that includes the following activities by year; all activities shall be conducted in consultation as described in (e) below:

(1) In 2006, the licensee shall implement permanent measures and shall construct permanent facilities for upstream eel passage on both the Holyoke and South Hadley sides of the Project and shall conduct effectiveness studies; and

(2) In 2007, the licensee shall complete additional effectiveness studies if determined necessary based on effectiveness studies conducted in 2006.

(c) *Annual reports of upstream eel passage.* Commencing on March 1, 2005, the licensee will distribute annual reports to U.S. Fish and Wildlife Service, the National Marine Fisheries Service, Massachusetts Division of Fisheries and Wildlife, Massachusetts DEP, Trout Unlimited, the Connecticut River Watershed Council, and the Connecticut River Atlantic Salmon Commission describing the actions taken in the prior year and the results of data collection at the eel facilities on the South Hadley and Holyoke sides of the Project. The licensee shall file the annual reports with the Commission and Massachusetts DEP on or before March 1 of each year.

(d) *Downstream eel passage.* The licensee shall implement and monitor downstream eel passage at the Holyoke Project as part of the downstream fish passage plan and facility enhancements under License Article 410.

(e) *Consultation with resource agencies and other parties.* The licensee shall follow the consultation process described in License Article 420, and distribute all reports to the resource agencies and other parties listed in that

Article. The licensee shall also provide copies of all reports to the Connecticut River Atlantic Salmon Commission.

(f) The Commission reserves the right to require changes to the proposed upstream eel passage plan. Implementation of any provision outlined in the plan shall not commence until the Commission notifies the licensee that the filing is approved. The licensee shall implement the plan as approved by the Commission, including any changes required by the Commission. Any structure built in accordance with this plan shall be shown on the as-built drawings filed pursuant to License Article 303.

Article 413. *Upstream and Downstream Fish Passage Facilities Monitoring.*

(a) Upon completing construction of new, or modifications to existing upstream and downstream fish passage facilities required by License Articles 410-412, the licensee shall monitor the use and effectiveness of those fish passage facilities, pursuant to the plans developed under those License Articles, to ensure effective fish and eel passage. In addition, the licensee shall monitor effectiveness of: (i) the channel modifications [as specified in the Comprehensive Operations and Flow Plan, as approved by the Commission on June 24, 2003 (103 FERC ¶ 62,178)]; and (ii) the full depth louvers in the first level of the canal system, pursuant to a plan to be filed with the Commission on or before July 1, 2004 [as specified in License Article 408(c) above].

The effectiveness monitoring plans shall include the specific provisions for monitoring the effectiveness of the specific facility, as well as a schedule for: (1) implementation of that plan; (2) consultation as described in (b) below concerning the results of the monitoring; and (3) filing the results, the resource agencies' and other parties' comments, and the licensee's response to the comments, with the Commission and the Massachusetts Department of Environmental Protection.

(b) The licensee shall follow the consultation process described in License Article 420, and shall also provide copies of all reports to the Connecticut River Atlantic Salmon Commission.

(c) The Commission reserves the right to require changes to the effectiveness monitoring plans. Implementation of any provision outlined in the plans shall not commence until the Commission notifies the licensee that the filing is approved. The licensee shall implement the plan(s) as approved by the Commission, including any changes required by the Commission.

Article 414. *Annual Fish Passage Construction Plans.*

(a) Except as otherwise provided in License Articles 410-412 above, the licensee shall prepare an annual construction plan for fishway construction to be undertaken in that coming year, in consultation as described in (b) below. A draft of that construction plan shall be provided to the resource agencies and other parties on or before January 31 of each year, containing the detailed plans and schedule for fishway construction to be undertaken during that calendar year; the construction plan shall be designed to avoid interruption of the operation of the fish lifts at the Project. The licensee shall file the construction plan with the Commission and Massachusetts Department of Environmental Protection on or before February 28 before the applicable construction period commences.

(b) The licensee shall follow the consultation process described in License Article 420.

(c) The Commission reserves the right to require changes to the proposed annual construction schedule. The licensee shall implement the annual construction plan(s) as approved by the Commission, including any changes required by the Commission.

Article 415. *Section 18 Fishway Prescription.* Authority is reserved to the Commission to require the Licensee to construct, operate, and maintain, or to provide for the construction, operation, and maintenance of, such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate, pursuant to section 18 of the Federal Power Act.

Article 416. *Threatened and Endangered Species Protection Plan.*

(a) The licensee shall implement the Threatened and Endangered Species Protection Plan (T&E Plan) as approved by the Commission on June 6, 2003 (103 FERC ¶ 62,131) covering the federally and state endangered shortnose sturgeon (*Acipenser brevirostrum*), federally threatened and state endangered bald eagle (*Haliaeetus leucocephalus*), federally threatened and state endangered Puritan tiger beetle (*Cicindela puritana*), federally endangered and state endangered dwarf wedge mussel (*Alismidonta heterodon*), and state endangered yellow lampmussel (*Lampsilis cariosa*).

(b) The licensee shall follow the consultation process described in License Article 420, with respect to any proposed modifications to the T&E Plan.

(c) The Commission reserves the right to require changes to any proposed modifications to the T&E Plan. The licensee shall implement the modified T&E Plan as approved by the Commission, including any changes required by the Commission.

(d) In addition to implementing the provisions of the Commission-approved T&E Plan, the licensee shall implement measures consistent with the Terms and Conditions included in the Incidental Take Statement attached to the Biological Opinion for shortnose sturgeon (attached as Appendix B to this license order).

(1) The licensee shall handle shortnose sturgeon in accordance with the Shortnose Sturgeon Handling Plan (attached as Appendix F to this license order), and shall annually (by January 1st) consult with the National Marine Fisheries Service (NOAA Fisheries) regarding updates to the Handling Plan. Any updates to the Handling Plan shall be made annually by April 1st. The licensee shall file any such updates to the Handling Plan with the Commission.

(2) The licensee shall annually submit (by January 1st) a report to NOAA Fisheries and the Commission on the status of shortnose sturgeon at the Holyoke Project, including: (1) the number of sturgeon identified passing upstream (and downstream, if detected); (2) the number of sturgeon rescued from the apron pools immediately downstream from the Holyoke dam; (3) the relative effectiveness of the fish passage facilities; and (4) mortality from the previous year.

(3) The licensee shall notify NOAA Fisheries and the Commission when the Holyoke Project reaches 75 percent of the incidental take levels for shortnose sturgeon at the project.

(4) The licensee shall monitor water quality in the holding tanks used at the Downstream Sampling facility. The licensee shall ensure that: (1) no shortnose sturgeon is held for more than 12 hours; (2) water depth in the holding tanks is sufficient; and (3) water temperature in the holding tanks does not exceed 27°C and dissolved oxygen in the tanks is at least 5mg/l at all times.

Article 417. *Invasive Species Monitoring Plan.*

(a) The licensee shall implement the Invasive Species Monitoring Plan as approved by the Commission on August 20, 2001 (96 FERC ¶ 62,174), and amended by order issued on December 13, 2004 (109 FERC ¶ 62,186), to monitor purple loosestrife (*Lythrum salicaria*), water chestnut (*Trapa natans*), and zebra mussel (*Dreissena polymorpha*) in Project waters.

(b) The licensee shall follow the consultation process described in License Article 420, with respect to any proposed modifications to the Invasive Species Monitoring Plan.

(c) The Commission reserves the right to require changes to any proposed modifications to the Invasive Species Monitoring Plan. The licensee shall

implement the modified monitoring plan as approved by the Commission, including any changes required by the Commission.

(d) If at any time during the term of the license, the U.S. Fish and Wildlife Service (FWS) and/or the Massachusetts Division of Fisheries and Wildlife (Massachusetts DFW) demonstrate that purple loosestrife, water chestnut, or zebra mussels are significantly affecting fish and wildlife populations at the Project and control measures are needed, and the Commission agrees with those determinations, the Commission may require the licensee to cooperate with the FWS and Massachusetts DFW to undertake reasonable measures to control or eliminate these species in Project waters.

Article 418. *Comprehensive Recreation and Land Management Plan.*

(a) The licensee shall implement the Comprehensive Recreation and Land Management Plan (CRLMP) for the Holyoke Project, as approved by the Commission on March 31, 2004 (106 FERC ¶ 62,243), and modified by the order issued on November 23, 2004 (109 FERC ¶ 61,206). The CRLMP includes a Recreation Plan, Land Management Plan, and Buffer Zone and Riparian Management Plan.

(b) The licensee shall follow the consultation process described in License Article 420, with respect to the CRLMP, and shall also consult with Town of South Hadley, City of Holyoke, Connecticut River Channel Marking Committee, Connecticut River Greenway State Park, Trustees of Reservation, U.S. National Park Service, Pioneer Valley Planning Commission, and local marinas.

(c) The Commission reserves the right to require changes to any proposed modification to the CRLMP. The licensee shall implement the modified plan as approved by the Commission, including any changes required by the Commission.

Article 419. *Cultural Resources Management Plan.*

(a) The licensee shall implement the Cultural Resources Management Plan as approved by the Commission on June 27, 2001 (95 FERC ¶ 62,274) (CRMP).

(b) The licensee shall follow the consultation process described in License Article 420, with respect to the Cultural Resources Management Plan.

(c) The Commission reserves the right to require changes to any proposed modification to the Cultural Resources Management Plan. The licensee shall implement the modified plan as approved by the Commission, including any changes required by the Commission.

Article 420. *Cooperative Management and Consultation.* The licensee must comply with the conditions imposed upon it in Part IV of the Settlement (and the Appendices referenced therein) covering the Holyoke Project, as filed with the Commission on March 12, 2004.

With respect to a plan, modification to a plan, or work to be undertaken pursuant to the Settlement, the licensee shall first provide a draft of such plan, modification to a plan, or description of work to the resource agencies [U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NOAA Fisheries), Massachusetts Division of Fisheries and Wildlife (Massachusetts DFW), Massachusetts Department of Environmental Protection (Massachusetts DEP)] and to the other parties (Trout Unlimited and the Connecticut River Watershed Council), providing a minimum of 30 days for review, comment and recommendations prior to filing the plan with the Commission and Massachusetts DEP. Prior to filing the plan or description of work with the Commission and Massachusetts DEP, the licensee shall obtain the concurrence and/or approval of that plan/work from the resource agency or resource agencies as follows: (1) FWS and/or NOAA Fisheries for a plan/work which may impact a resource for which FWS and/or NOAA Fisheries have responsibilities under the Endangered Species Act (U.S.C. §1531, *et seq.*); (2) Massachusetts DFW and/or Massachusetts DEP for a plan/work which Massachusetts DFW and Massachusetts DEP have responsibilities under the Massachusetts Endangered Species Act (M.G.L. c. 131A); (3) Massachusetts DEP for a plan/work that is required by the Water Quality Certification issued by Massachusetts DEP on February 14, 2001 (as incorporated in Article 421); and/or (4) FWS and/or NOAA Fisheries for all decisions on measures needed for fish passage, fish passage design drawings, and fish passage implementation schedules for which the FWS and/or NOAA Fisheries have specific statutory responsibility under the Federal Power Act (with such concurrence and/or approval not unreasonably withheld, and with any refusal to concur/approve to be based on sound science).

The licensee shall include with the filing with the Commission and Massachusetts DEP, documentation of consultation; copies of comments and recommendations on the proposed plan, modified plan and/or work after it has been prepared and provided to the resource agencies and the other parties consulted; and specific descriptions of how the comments are accommodated by the licensee's proposed plan and/or work. If the licensee does not adopt a recommendation by an agency or other party [other than a recommendation by an agency(ies) from which the licensee shall obtain prior concurrence and/or approval, as described in (1), (2), (3) and (4) above], the filing shall include the licensee's reasons, based on project-specific information.

Article 421. *Compliance with Water Quality Certification.* The licensee shall comply with the Water Quality Certification issued by the Massachusetts

Department of Environmental Protection (Massachusetts DEP) on February 14, 2001 (pursuant to the settlement of the state administrative appeal of the 1999 Water Quality Certification). All of the conditions of the 2001 Water Quality Certification are incorporated into this License Article and are conditions on the License. A copy of the 2001 Water Quality Certification is attached to this license order as Appendix A.

Article 422. *Use and Occupancy.*

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

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use

of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed. If no conveyance was made during the prior calendar year, the licensee shall so inform the Commission and the Regional Director in writing no later than January 31 of each year.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the

land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

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

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

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

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

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

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G

or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G or K drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(H) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters relating to that filing. Proof of service on these entities must accompany the filing with the Commission.

(H) This order is final unless a request for rehearing is filed within 30 days of the date of its issuance, as provided in section 313(a) of the FPA. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

By the Commission.

(S E A L)

Linda Mitry,
Deputy Secretary.

APPENDIX A – Conditions of Water Quality Certification Issued by the Massachusetts Department of Environmental Protection on March 19, 2001

In accordance with the provisions of M.G.L. c. 21, §§ 314 CMR 4.00, and §401 of the Federal Clean Water Act (Public Law 92-500, as amended), MADEP has determined that there is reasonable assurance that the Project described above can be conducted in a manner which will not violate applicable water quality standards, and will be in compliance with §§301, 302, 303, 306, and 307 of the Federal Clean Water Act and other appropriate requirements of state law. MADEP issues this Water Quality Certification for the Project subject to the following conditions:

Compliance

1. The Project shall be operated by the Project Owner/license holder and its nominees, successors and/or assigns (hereinafter collectively referred to as “Project Owner”) in accordance with all provisions and conditions contained in this certification and the provisions of Project Owner’s FERC license, including any modifications or amend made thereto, to the extent such license provisions and modifications or amendments are consistent with this water quality certification. The Project shall be operated to maintain the designated uses of the Connecticut River as outlined in the Massachusetts Surface Water Quality Standards at 314 CMR 4.00 and to maintain an integrated and diverse biological community in the Connecticut River.
2. All activities shall be conducted in compliance with the Massachusetts Wetlands Protection Act, including the Rivers Protection Act, M.G.L. Chapter 131, Section 40, and the regulations promulgated thereunder. An application for a Water Quality Certification shall be submitted and approved by MADEP prior to any activity that will cause a discharge subject to §404 of the federal Clean Water Act. The Project Owner will be expected to develop and implement a plan to monitor and control erosion during any and all construction activities to keep waters free from turbidity in concentrations that are aesthetically objectionable or would impair any designated use(s) of these waters.
3. The Project Owner shall comply with M.G.L. c. 91 (Public Waterfront Act), and the regulations promulgated thereunder.
4. All maintenance and repair activities, including disposal of debris and removal of sediments in impounded areas, shall be conducted in a manner so as not to impair water quality.
5. Any change to the Project that would have a significant or material effect on the findings, conclusions, or conditions of this certification, including Project operation, must be submitted to MADEP for prior review and written approval where appropriate and authorized by law, and only as related to the change proposed.

6. Except as otherwise provided in Condition # 18 (Moratorium), MADEP may request, at any time during which this certification is in effect, that FERC reopen the license to make modifications necessary to maintain compliance with the Massachusetts Surface Water Quality Standards at 314 CMR 4.00 and/or other appropriate requirements of state law.

7. Except as otherwise provided in Condition #18 (Moratorium), MADEP reserves the right to add and alter the terms and conditions of this certification when authorized by law and as appropriate to carry out its responsibilities during the life of the Project with respect to water quality, threatened and endangered species, or new generation, such as a third turbine. MADEP's enabling legislation and regulations and M.G.L c. 30A govern whether such changes to this certification are subject to administrative and/or judicial review.

8. A copy of this certification shall be prominently posted within the Project powerhouse.

9. Run-of-River

(a) Upon certification, the Project shall be operated in an instantaneous run-of-river mode, which will result in the stabilization of the impoundment to within 0.2 feet of normal pond elevation. The "normal" pond elevation will be 0.2 feet below the elevation of the top of the flash boards (which is currently approximately 103.1 feet). MADEP understands that stabilization of the impoundment to within 0.2 feet of normal pond elevation may not be possible until the rubber dam has been installed. The Project Owner met with MADEP, the Massachusetts Division of Fish and Wildlife (MADFW) and the United States Fish and Wildlife Service (USFWS), and presented to MADEP, MADFW and USFWS for MADEP approval an interim run-of-river operations plan. The plan demonstrated the Project Owner's good faith efforts to comply with the run-of-river condition in the interim period before the rubber dam is installed.

(b) After completion of the rubber dam, the Project shall be operated in an instantaneous run- of-river mode, which will result in the stabilization of the impoundment to within 0.2 feet of normal pond elevation. The "normal" pond elevation will be 0.2 feet below the elevation of the new rubber dam crest (which will be approximately 103.1 feet). Within six months after installation of the rubber dam, the Project Owner shall meet with MADFW and USFWS and present to MADFW, USFWS and MADEP for MADEP approval a final run-of-river operation and monitoring plan. The plan shall describe the methods used to monitor headpond elevation and river flows, adjust Project operations, and shall also describe how Project operation records will be maintained and made available to FERC, MADEP, MADFW, and USFWS to verify compliance with run-of-river operations.

This run-of river operating regime may be modified due to operating emergencies beyond the control of the Project Owner (e.g. extreme runoff events, droughts, ice conditions, equipment failure, flood storage requirements or OP4 Action 13 events in which ISO New England calls upon the Project Owner to generate) that may result in conditions making the operational restrictions and requirements contained herein impossible to achieve without resort to extraordinary measures or that are inconsistent with the prudent and safe operation of the Project. Under such extreme conditions, operation at variance with the commitments contained in this condition shall not be deemed to violate this Water Quality Certification. This condition shall not be interpreted as providing the Project Owner broader authorization to operate at variance with the requirements provided herein than is provided for in the FERC license. The Project Owner shall notify MADEP, MADFW and USFWS within 24 hours of such an emergency event and shall prepare and provide the three agencies with a written report of each incident, identifying the variances from normal operations that occurred, and identifying ways of avoiding fixture occurrences, if applicable. The written report shall be submitted no later than 45 days after the emergency condition ends. MADEP will review the report and approve or disapprove of the Project Owner's decision to modify the operating regime because of extreme conditions, if MADEP disapproves Project Owner decision to modify the operating regime, it shall so notify Project Owner, in writing, within 45 days of receiving the report from the Project Owner. MADEP's written notification shall describe in reasonable detail the reasons for disapproval and shall serve as a Notice of Noncompliance pursuant to M.G.L c. 21A, sec. 16 and 310 CMR 5.00, unless otherwise specified in the written notification. At the Project Owner's request, MADEP officials will review with the Project Owner and with personnel of other regulatory agencies, including agencies responsible for electric power generation, the reasons for and appropriateness of the disapproved modification of the run-of-river operating regime. Project Owner may appeal any subsequent imposition of an administrative penalty pertaining to similar future violations of this condition and in that appeal may contest the original disapproval notice.

10. **Rubber Dam**

The Project Owner shall replace the existing wooden flashboards along the crest of the dam with an inflatable rubber fabric dam system. By April 15, 2001, the Project Owner shall submit to MADEP, MADFW, the Massachusetts Department of Environmental Management (MADEM) and USFWS for MADEP approval, a plan for rubber dam construction based upon consultation with MADFW, USFWS, MADEM and MADEP. The plan should include at a minimum: (i) the designs and installation schedule; (ii) procedures for installing the rubber dam, including measures to minimize effects on water quality, biological resources and impoundment boaters during the period of installation; and (iii) appropriate erosion and sedimentation controls. The Project Owner shall implement the plan as approved by MADEP.

11. **Bypassed Reach flows**

(a) Upon certification, from November 16 through March 31 of each year, and for any other periods of time when fish passage facilities are not in operation and flows provided for establishing a zone-of-passage are not needed, the Project Owner shall maintain a continuous minimum flow, as measured in the bypassed reach, of 840 cfs or inflow to the Project (less canal minimum flow) as measured at the USGS gauge at Montague, whichever is less. If, in the future, fish passage operations are modified by USFWS or the National Marine Fisheries Service (NMFS) to include these specified times, these habitat-based flows shall be superseded by zone- of-passage flows.

This operating regime may be modified during any construction activities that, as demonstrated to the satisfaction of MADE, make it unreasonable to achieve the restrictions and requirements contained herein or are inconsistent with the prudent and safe operation of the Project. If the bypassed reach is dewatered for any reason, the Project Owner shall be required to monitor for stranded shortnose sturgeon and notify MADEP and MADFW immediately if any stranded fish are observed. Shortnose sturgeon will be immediately transferred from dewatered areas to suitable habitat. Mi handling and transfer of shortnose sturgeon from the stranded location will be conducted according to the requirements of the NMFS Incidental Take Permit.

(b) Upon certification, the Project Owner shall release 1,300 cfs into the bypassed reach from April 1 through November 15 of each year, as zone of passage flows for migratory fish. The requirement for 1,300 cfs from July 16 through September 14 (for shortnose sturgeon zone of passage) will not be enforced until such time as safe and effective shortnose sturgeon downstream passage measures have been demonstrated, or until NIMFS or MADFW determine that upstream passage is otherwise appropriate.

(c) Upon certification, the Project Owner shall meet with MADFW, USFWS, MADEP and NMFS and by November 1, 2001 shall submit to MADEP, MADFW, USFWS and NMFS for MADEP approval, a plan to redistribute flow to the three channels in the bypassed reach. The plan shall address redistribution of water following installation of the rubber dam during periods when minimum bypassed reach flows are required, and shall be designed to provide approximately 600 cfs in the east channel, 100 cfs in the center channel and 140 cfs in the west channel. MADEP understands and agrees that the flow redistribution cannot be precisely engineered and following plan implementation, the actual flows as measured in each channel following modification may differ from the 600/100/140 cfs redistribution goal, but shall not be less than the total 840 cfs required.

The Project Owner shall implement the plan during the construction season following installation of the rubber dam as approved by MADEP. Upon completion of

channel modifications, the Project Owner shall maintain the flow redistribution to the three channels resulting from the channel modifications

(d) Bypassed reach minimum flows will be measured in the bypassed reach and recorded hourly. The Project Owner shall submit an interim plan by March 1, 2001 for estimating flows in the bypassed reach until such time as a final plan for bypassed reach flow measurement has been approved by MADEP. A final plan for measuring flows in the bypassed reach shall be submitted to MADFW, USFWS and MADEP for MADEP approval within three months after installation of the rubber dam and shall be implemented as soon as is practical, but no longer than one year after rubber dam completion. The final plan should address gauging total bypassed reach flow after both rubber dam installation and channel modifications are completed, gauging channel specific flows once to determine flow distributions resulting from channel modifications, adjustment of flows so as to maintain minimum bypassed reach flows, and recording and reporting of bypassed reach flows. The Project Owner shall implement the plan as approved by MADEP within one year after rubber dam installation and channel modifications are complete.

12. **Project flows**

(a) Upon certification, the Project Owner shall operate the Project using the following flow distribution prioritization during the Atlantic salmon smolt downstream migratory period (April 1 through June 15 of each year), and periodic review of this prioritization will be conducted with the Project Owner by MADFW, USFWS, and NMFS to determine effectiveness:

- (1) Canal minimum flows (400 cfs downstream of louver bypass pipe operating at 150 cfs);
- (2) Bypassed reach minimum habitat flows (840 cfs);
- (3) Flows sufficient to operate upstream fish passage attraction facilities (up to 440 cfs with new facilities- 200 at spillway entrance and 120 at each tailrace entrance);
- (4) Zone of passage flows (bypassed reach flow increases to 1,300 cfs);*
- (5) Hadley Falls Station to Unit One, if available (1,300 cfs to 3,300cfs);**
- (6) Canal operations jump to 2000 cfs*** (drop Hadley to 1,300 cfs); and then
- (7) Hadley Falls Station to capacity.

*Note: Project Owner will have to notch flashboards to pass 1,300 cfs.

****Note:** After rock is removed from second tailrace entrance, and MADEP is satisfied that the entrance is effective, either unit will be able to run.

*****Note:** Canal flow of 2,000 cfs may change after full depth louver installation and MADEP approval (new full depth louvers may require more or less water to maintain effectiveness).

Installation and verification of effectiveness of the angled bar rack (or other downstream passage protection structure) at Hadley Falls Intake may allow canal flows to remain at minimum flow while Hadley Units 1 and 2 run to maximum, and then additional water may be run through the canal.

(b) Upon certification, the Project Owner shall operate the Project using the following flow distribution prioritization during juvenile clupeid downstream migration period (September 1 through November 15 of each year), and periodic review of this regime will be conducted with the Project Owner by MADEP, MADFW, USFWS, and NIMFS to determine effectiveness:

- (1) Canal minimum flows (400 cfs downstream of louver bypass pipe operating at 150 cfs);
- (2) Bypassed reach minimum habitat flows (840 cfs);
- (3) Flows sufficient to operate upstream fish passage attraction facilities (up to 440 cfs with new facilities- 200 at spillway entrance and 120 at each tailrace entrance);
- (4) Zone of passage flows (bypassed reach flow increases to 1,300 cfs for sturgeon and fall salmon passage); and then
- (5) Hadley Falls Station to capacity or any combination of Hadley units and canal operations as long as canal operations jump from 400 to at least 3,000 cfs*.

*Note: 3,000 cfs was the minimum flow used in louver evaluation with juvenile clupeids- this flow may change after full depth louver installation and MADEP approval (new full depth louvers may require less water to maintain effectiveness).

(c) Within three months of this certification, the Project Owner shall submit a low flow contingency plan to MADEP, MADFW, and USFWS for MADEP approval. The Project Owner shall implement the plan as approved by MADEP. The low flow contingency plan should address conditions of low flow outside of the anadromous fish passage seasons. Spring passage season is generally April 1 through July 15; fall passage

season is generally September 15 through November 15; and shortnose sturgeon passage season is generally July 16 through September 14.

Low flow contingency plan should incorporate the following prioritization:

- (1) Run-of-river: stable pond (do not draw down pond to maintain minimum flows);
- (2) Canal minimum flows (400 cfs downstream of louver bypass);
- (3) Bypassed reach minimum habitat flow (840 cfs or remaining inflow, whichever is less); and then
- (4) Hadley Falls units.

13. **Canal Operations**

- (a) Upon certification, Project Owner shall implement an interim canal system operation plan, whereby minimum flows of 400 cfs, downstream of the louver bypass, are discharged through the canal system. Canal unit rating curves will be used to determine canal system flow. The Project Owner shall implement the plan as approved by MADEP.
- (b) Within three months of issuance of this certification, the Project Owner shall meet with MADFW and USFWS and submit to MADEP, MADFW and USFWS for MADEP approval a plan to provide permanent, continuous minimum flows of 400 cfs downstream of the louver bypass through the canal system. Canal unit rating curves will be used to determine canal system flow. The Project Owner shall implement the plan as approved by MADEP.
- (c) The Project Owner shall implement the August 10, 2000 interim plan for protecting aquatic resources during canal drawdowns until the 5 year plan described in Condition 13 (d) below is completed.
- (d) The Project Owner shall meet with MADFW and USFWS and by June 1, 2001, shall submit to MADEP, MADFW and USFWS for MADEP approval, a 5-year plan for protection and monitoring of aquatic resources, including mussel populations, in the canal system. The plan shall include, but not be limited to, an evaluation of the frequency and necessity of canal drawdowns. The Project Owner shall implement the plan as approved by MADEP. Results of the monitoring plan shall be submitted to MADFW, USFWS and MADEP for review. The five year report shall identify changes in the mussel populations over time, proposals for changes in canal operations or structures, if any, to protect mussel populations, and recommendations regarding future monitoring of mussel populations.

(e) By April 15, 2001, the Project Owner shall submit to MADFW, USFWS, NMFS, and MADEP a plan to exclude shortnose sturgeon and other fish from the fishlift attraction water.

The Project Owner shall implement the plan as approved by MADEP during the first canal drawdown after approval.

14. **Fish Passage Facilities**

(a) Upon certification, the Project Owner shall meet with MADFW, USFWS, and NMFS regarding the fishway improvements and submit an implementation schedule to MADEP, MADFW USFWS and NMFS for MADEP approval. The implementation schedule shall include a major redesign and reconstruction of the upstream and downstream fish passage facilities in three phases.

(1) Phase 1, to be completed in 2001, shall consist of:

- (i) Replacement of the existing wooden flashboards along the crest of the dam with an inflatable rubber fabric dam system;
- (ii) Installation of full depth louvers at the Holyoke canal louver facility by October 31, 2001;
- (iii) Modifications to both lifts for 40,000 cfs operation and fish lift attraction water modifications providing adjustable fishway entrance attraction flows of up to 200 cfs at the spill entrance and up to 120 cfs at each of the tailrace collection gallery entrances; and
- (iv) Removal of the rock outcropping at the West tailrace fishway entrance.

(2) Phase 2, to be completed in 2002, shall consist of

- (i) Replacement of the tailrace lift tower, auxiliary equipment, and hopper to accommodate 33 cubic feet per minute capacity;
- (ii) Replacement of the spillway lift tower, auxiliary equipment and hopper to accommodate 46 cubic feet per minute capacity;
- (iii) Modifications to exit flume to connect it with the new spill lift; and

(iv) Eel passage at both fish lifts.

The 2002 Phase 2 schedule above will require continuous construction during the period July 1, 2002 (or such earlier date as appropriate based on actual fish migration) through December, 2002. Continuous construction during this period may eliminate fall fishlift operations (September 15 through November 15) in 2002 only.

(3) Phase 3, to be completed in 2003, shall consist of:

(i) Increasing the width of the fish lift exit channel to 14 feet up to the fish counting station;

(ii) Installation of a high capacity adjustable drain valve in the flume;

(iii) Addition of a second fish trap in the exit flume;

(iv) Modifications to the fish trapping and hauling system;

(v) Eel ladder installation at the South Hadley side of the dam;

(vi) Installation of an angled bar rack or alternative structure at the Hadley Falls Intake, pending completion of site modeling and behavior studies, in accordance with the provisions of section (i) below; and

(vii) Construction of the No. 2 overflow channel barrier.*

*Note: The phased construction plans need not provide for construction of a barrier across the No. 2 overflow channel if all of the following conditions are met: the Holyoke canal fill depth louver system is installed and is effective; Boat Lock Station bypass is decommissioned; the No. 2 overflow will not be used for balancing canal flow during upstream passage; and a plan to address stranding of fish after watering of the No.2 overflow channel is submitted to MADEP, MADFW and USFWS, and is approved by MADEP. If the above conditions are not met, a barrier across the No. 2 overflow channel will be constructed after receiving approval of the construction plans from MADEP.

Upon completion and review of each construction phase, and thereafter as necessary, the Project Owner shall continue HWP's prior practice of consulting and cooperating with MADEP, MADFW, USFW and NMFS and shall continue making

Modifications and Adjustments to the fish passage facilities to improve their operation and efficiency (“Modifications and Adjustments”).³⁷

³⁷ Examples of HWP’s prior practice of voluntarily making modifications and adjustments to fish passage facilities include:

- Design and installation of the baffle in the Holyoke fishway exit flume to lower water level in the flume downstream of the baffle, thus allowing lift operation at higher pond elevations;
- Installation of underwater video camera and monitor to allow observation of fish entering the trap at Holyoke;
- Installation of staff gauges at various points in the Holyoke fishlift system to monitor water levels;
- New pneumatic pressure system in the gate control system at 1 to speed up trap gate operation;
- Addition of screening on the trap gate at Holyoke to prevent escape of small fish;
- Installation of an electric hoist to replace manual transfer of salmon to holding facilities at Holyoke;
- Extension of electrical circuits to include outlets for salmon holding facilities at Holyoke;
- Plywood overlays on rack (Hadley 1);
- Adjustments to the depth/width of bypass sluice or entrance weir (wing wall outside bascule gate);
- Rounding corners on concrete or other entrance changes to improve the flow field (stoplogs at spillway entrance);
- Adjusting flows through the fish passage facilities;
- Installing fish attraction lights under Turner’s Falls Gatehouse; and
- Changing hours/days of fishway operation.

(b) Upon certification, the Project Owner shall meet with MADEP, MADFW, USFWS and NMFS to develop detailed construction plans and schedules, which shall be submitted to these agencies by April 15, 2001 and thereafter by January 31 of each construction year for review and approval by MADEP. The detailed construction schedules shall be designed to minimize interruption of the fishlift operations and, to the extent possible, fishlift operation interruptions shall be scheduled during the months of July and August. The Project Owner shall implement the plans as approved by MADEP.

(c) By December 31 of the year of modification, Project Owner shall submit to MADEP, MADFW, USFWS, and NMFS for MADEP approval, a plan to study the effectiveness of:

- (i) The Holyoke canal full depth louver system;
- (ii) The rock removal at the West fishway entrance in the tailrace; and
- (iii) Channel modifications in the bypassed reach.

MADFW, USFWS and MADEP shall have the opportunity to comment and provide other input to the Project Owner on the study design. The study design shall include a schedule for completion of the studies and submission of the study results regarding facility effectiveness no later than December 31 of the year of study.

By December 31, 2003 (end of Phase 3), the Project Owner shall submit to MADEP, MADFW and USFWS for MADEP approval, a plan to study the effectiveness of all other Project modifications implemented to date. MADFW, USFWS and MADEP shall have the opportunity to comment and provide other input to the Project Owner on the study design. No study design shall be implemented until approved by MADEP. The study design shall include a schedule for completion of the studies and submission of the study results regarding the facility effectiveness no later than December 31 of the year of study.

The Project Owner shall study and evaluate the effectiveness of the spillway entrance and channel after completion of the other fishway modifications. Based on the results of the effectiveness study, MADEP may require modifications to the spillway entrance and channel. Effective passage of shortnose sturgeon into the spillway lift will be required if and when MADFW recommends that MADEP mandate upstream passage of shortnose sturgeon. The Project Owner shall implement any modifications as required or approved by MADEP. Modifications required by MADEP under this condition shall not be subject to Condition #18 (Moratorium).

(d) The Project Owner shall operate upstream fish passage facilities from April 1 to July 15 annually, to accommodate migratory fish. The Project Owner shall operate

upstream fish passage facilities from September 15 through November 15 annually to accommodate fall salmon passage. Additional dates or hours of operation may be necessary for shortnose sturgeon or resident fish passage, as required by MADFW. Operating dates can be adjusted by mutual agreement between the Project Owner and MADFW, as necessary. Hours of operation will be established by MADFW in consultation with the Project Owner. Lifts have historically operated from 9:00 a.m. to 3:00 p.m. at the start of the anadromous fish passage period when fish passage is less than 2,000 American shad per day, 8:00 a.m. to 6:00 p.m. once daily passage has exceeded 2,000 American shad, and from 8:00 a.m. to 8:00 p.m. during peak anadromous fish migration periods, as determined by MADFW. The lifts will continue to operate on this basic schedule per order of MADEP and as determined by MADFW. MADFW will provide 24 hour notice of any proposed changes to this basic schedule to the Project Owner.

(e) Ledge excavation is required on the west wall of the tailrace in the area immediately downstream of the existing (but non-functional) tailrace entrance to allow operation of this entrance. In Phase 1, the Project Owner will excavate the tailrace wall approaching the Hadley Unit 2 fishway entrance, removing the rock outcrop at the fishway entrance to shape the approach to lead fish up the side of the tailrace adjacent to the discharge from the Unit 2 side entrance. Phase 1 construction plans will include a survey of both Hadley Units 1 and 2 entrances, and shall provide that the Project Owner meet with MADFW and USEWS during construction and obtain MADEP approval of the final excavation. The Project Owner shall implement the construction plans as approved by MADEP.

(f) The Project Owner shall implement the Scope of Work for fishway monitoring operations as approved by MADEP. All operations necessary for safe, timely and efficient fish passage including, but not limited to, counting, trapping, monitoring and collection of biological data will be under the direction of MADFW and paid for by the Project Owner. The Project Owner may conduct operations using their own resources or may subcontract.

(g) On or before December 31, 2003, the Project Owner shall meet with MADFW and USFWS and submit to and MADFW, USFWS and MADEP for MADEP approval, a plan for evaluation and monitoring of upstream and downstream resident fish passage through the Project. The Project Owner shall implement the plan as approved by MADEP. The Project Owner shall prepare a report and a recommended schedule for implementation, consistent with Condition #18 (Moratorium), that identifies any changes to fishway operations or structures necessary to protect and enhance the passage of resident fish within 6 months after submitting the monitoring results to MADEP MADFW and USFWS. Based on the results of the studies and the recommendations of the Project

Owner, MADEP shall approve a schedule for implementation, consistent with Condition # 18 (Moratorium).³⁸

(h) The Project Owner will meet with MADFW and USFWS to develop, design, and install a new fish trapping and hauling system during Phase 3 construction. The system shall be similar to the system proposed by HG&E, unless Phase 1 and Phase 2 modifications result in incompatibility between the modified fish passage facilities and the HG&E system, or the Project Owner proposes a facility which provides substantially similar benefits to those provided by the HG&E design. The Project Owner will submit plans for a new, fish trapping and hauling system to MADFW, USFWS and MADEP for MADEP approval by January 31, 2003. The Project Owner shall design new trapping and hauling systems as an integral part of the phased construction. While it may be possible for the Project Owner to install the system at the end of Phase 3, MADEP will not allow any interruption of fish trapping and hauling during fish passage season. Trapping and trucking shad is an important function that the Project Owner cannot interrupt during migration seasons before, during, or after construction. The Project Owner must employ a functioning trapping and trucking system every lift season, including a functioning trap for salmon and the ability to trap and truck shad.

(i) The Project Owner shall consult with MADFW, USFWS, NMFS, Trout Unlimited, the Connecticut River Watershed Council and MADEP (consulting parties) and submit a final design for downstream passage improvements to the consulting parties for MADEP approval. This final design shall include, but not be limited to, improvements for downstream passage of eels, shortnose sturgeon, and other migratory fish. The Project Owner shall initiate a hydraulic research study to model hydraulics in the vicinity of the Hadley Falls intake structures to aid in the design of an angled bar rack. The study shall be completed by July 31, 2001. The consulting parties shall meet regularly to review the hydraulic research study and provide comments and other input to the Project Owner. The Project Owner has initiated a shortnose sturgeon flume study to evaluate fish guidance efficiency. Based on the results of these studies and other research results, the Project Owner shall work cooperatively with the consulting parties to design an angled bar rack or alternative downstream fish passage measures to be Stalled during Phase 3 construction, with construction completed by December 31, 2003. MADEP may approve delay of facility construction completion beyond December 31, 2003 if additional studies are needed or facility design takes longer than anticipated. The Project Owner shall implement the system for downstream passage improvements as approved by MAIDEP.

³⁸ For the 2002 construction season, these dates will be adjusted to permit the construction described in Condition No. 14(a).

(j) The Project Owner shall meet with MADFW, USFWS and NMFS and submit to MADFW and MADEP, for MADEP approval, a final design for the installation of new upstream eel passage at both existing fish lifts during Phase 2 construction in 2002. During 2002, the Project Owner shall study possible entrances to new upstream eel passage on the South Hadley side of the dam. The Project Owner shall meet with MADFW, USFWS and NMFS, and submit to MADFW USFWS, NMFS and MADEP for MADEP approval, a final design for the installation of new eel passage on the South Hadley side of the dam during Phase 3 construction in 2003. The Project Owner shall implement the design as approved by MADEP.

(k) By December 31, 2002³⁹ the Project Owner shall submit to MADEP a plan to meet shortnose sturgeon upstream and downstream passage need, timing and measures, and a schedule for implementation after consulting with MADFW, USFWS, and NMFS. The Project Owner shall implement the plan as approved by MADEP. Starting April 1, 2004, the Project Owner shall conduct a study of the effectiveness of the measures taken, and submit the results to MADEP. Results of the effectiveness study may result in:

- (i) changes in zone of passage timing;
- (ii) changes in zone of passage flows;
- (iii) changes in minimum flows in the bypassed reach;
- (iv) modifications to lift entrances; and/or
- (v) modifications to downstream passage facilities.

Continuing studies of effectiveness may be necessary at the discretion of MADEP.

(1) Unless and until otherwise ordered by MADEP, Project Owner shall continue to operate the Boatlock downstream bypass facility until the full depth louvers have been installed and determined to be effective by MADEP.

15. **Holyoke Fishway Monitoring Scope of Work**

(a) Fish Monitoring

Project Owner shall be responsible for fish monitoring activities as described herein from now through December 31, 2020. The Project Owner may appeal any

³⁹ Start of Phase 3 construction.

MADEP order requiring that it continue to pay reasonable costs of fish monitoring activities alter December 31, 2020. Such activities include: (i) fish counting; (ii) shad biological sampling, trapping and loading; (iii) shortnose sturgeon passage; (iv) salmon monitoring, trapping and holding; and (v) observation of lift operations, entrance gate settings, bypass facilities, and attraction water-flows to insure efficient fishway operation ('Fish Monitoring Work'). The Fish Monitoring Work will not be modified without prior written consent of MADEP and MADFW. Project Owners' responsibility for Fish Monitoring Work will be discharged either: (1) by directly paying⁴⁰ the actual costs of conducting the Fish Monitoring Work, as designated by MADFW, including salaries and equipment, in an amount not to exceed \$60,000/year, adjusted annually from the 4 quarter 1999 by the US Bureau of Labor Statistics Employment Cost Index, Wages and Salaries for Northeast Region (Series ID: ECU23 1021); or (2) by undertaking the Fish Monitoring Work itself, under the supervision of MADFW. If the Project Owner chooses to undertake the Fish Monitoring Work itself, it shall so inform MADEP and MADFW, in writing, by September 1 of the year before it first undertakes the work.

(b) Fish Counts

Anadromous and resident fish passing upstream through the Holyoke fish lift system will be identified and counted during the spring and early summer migration season (April 1 through July 15). Continuous counts will be recorded on an hourly basis, or the number of fish passing may be estimated using sub-sampling methods. If sub-sampling methods are employed, they shall be accepted and approved by MADFW prior to implementation. Water temperature will be monitored and recorded on an hourly basis during hours of fish lift operation. The number of lifts will be recorded hourly for each of the two lifts. Fish counts will be made available to the USFWS Connecticut River Coordinator and MADFW Anadromous Fish Biologist on a daily basis. During other times of year, lifts will be monitored for the presence of Atlantic salmon or shortnose sturgeon. The number of these fish lifted will be recorded. Disposition of lifted fish will be determined by MADFW.

(c) Shad Biological Sampling, Trapping and Loading

A subsample of the American shad passing upstream through the lifts will be measured and weighed. Their sex will be determined, and a scale sample will be removed and stored, using established procedures and methods. The number of fish to be processed, and their distribution over the duration of the migration season, will be determined on an annual basis by MADFW, but will not be in any higher proportions

⁴⁰ i.e., MADFW will not make any payment and then be reimbursed by Project Owner.

than in the past. The resulting length, weight, and sex data will be made available, along with fish counts, on a daily basis. Scale samples and all other biological sampling will be sent to MADFW for their use. Project Owner will continue to cooperate and assist regarding the trapping and transfer of shad to trucks at the facility.

(d) Salmon Trapping and Holding

Atlantic salmon migrating through the fish lifts may be trapped in the exit flume and transferred to on-site holding facilities. The lift crew will maintain contact with USFWS Cronin National Salmon Station (Cronin), or other facility as designated by MA.DFW, to arrange for the daily transfer of fish from the Project to Cronin by Cronin personnel or to an other designated facility by governmental agency personnel. The number of fish to be trapped (and the number to be released) will be determined by the Connecticut River Atlantic Salmon Commission (CRASC) and MADFW. On-site holding facilities will be maintained by MADFW, CRASC or USFWS. The Project Owner will maintain the trap and the facilities needed to transfer fish from the trap to the on-site holding facility.

(e) Shortnose Sturgeon

Dewatering of the bypass will necessitate monitoring of the bypassed reach for stranded shortnose sturgeon. Disposition of shortnose sturgeon that are lifted or in any other way collected will be determined by NMFS and MADFW. All handling and transfer of shortnose sturgeon will be conducted according to the requirements of the NMFS Incidental Take Permit.

16. Access To the Project

The Project Owner shall permit any employee, agent, consultant, contractor or authorized representative of MADEP or MADFW to enter the facilities in order to effectuate and ensure compliance with the terms and conditions of this Water Quality Certification including, but not limited to, entry for the purposes of: (i) investigating, sampling, inspecting, or photocopying documents or other writings, conditions, equipment, practices or property; (ii) interviewing facility personnel and contractors; (iii) making records of field activities; and (iv) observing any activities undertaken at the facilities under any of the provisions of this Water Quality Certification.

17. Cooperative Research/Management Activities

The Project Owner shall cooperate with research and management activities performed by holders of permits issued by MADFW, provided they ensure that any equipment and associated cables and wires used do not compromise safety or interfere with operation or maintenance of the Project. Parties shall contact the Project Owner in

advance to arrange for site access. The Project Owner shall determine whether unescorted or escorted access is appropriate for the activity to be performed. Requirements for unescorted site access may include execution of liability releases, safety training, limitation of access to specified areas and for specified activities only, approval of the proposed activity by other entities as applicable, and other similar precautions. The Project Owner shall provide escorted access free of charge on an occasional basis during normal business hours. Parties requiring access to the facility on a regular basis other than during normal business hours, shall either meet the Project Owner's requirements for unescorted access, or shall reimburse the Project Owner for the reasonable costs associated with regular or periodic escorted access.

18. Moratorium

This moratorium condition shall not apply to any changes to minimum flows or fish passage facilities that are deemed necessary to protect a threatened or endangered species by a state or federal agency authorized to protect such species. Nor shall this moratorium condition apply to: i) changes to minimum flows or fish passage facilities necessary to comply with changes to Massachusetts Water Quality Standards (currently set forth in 314 CMR 4.00); or ii)

“Modifications and Adjustments” or new facilities, as both are described in Condition #14.

(a) Minimum Flows

Prior to January 1, 2014, MADEP may issue an order requiring the Project Owner to increase the flows in the bypassed reach above the minimum flows set forth herein in Condition #11, provided that such increase shall not be effective until January 1, 2014, or if appealed for 18 months after issuance of that order, whichever is later (“Effective Date”). Project Owner may bring an appeal or other administrative or judicial action that challenges such an order, but shall make best efforts to have all such appeals or other actions resolved expeditiously. If all appeals or other actions by any party relating to an order for increased flows are not resolved by the Effective Date, Project Owner shall meet such increased flows from the Effective Date until such appeals or other actions are resolved.

After January 1, 2014, MADEP may amend the certificate as it relates to minimum flows to the extent allowed by then-existing law.

(b) Additional Fish Passage Facilities

Prior to January 1, 2014, MADEP may issue an order requiring the Project Owner to install new fish passage facilities beyond what is ordered in this 401 Certificate, provided that such installation shall not be required to commence for 18 months after the

issuance of that order if a permit is required or the Project Owner appeals, or 36 months if both a permit is required and the Project Owner appeals. Project Owner may bring an appeal or other administrative or judicial action that challenges such a MADEP order relating to fish passage facilities subject to this moratorium condition, but shall make best efforts to have all such appeals or other actions, as well as required permitting, resolved expeditiously and not later than January 1, 2014.

Any installations requiring construction to begin prior to January 1, 2014 shall not, in the aggregate, have a cost greater than \$350,000 installed book cost under Generally Accepted Accounting Principles, said \$350,000 (less that portion of it already spent) to be adjusted annually from the year 1999 by the Consumer Price Index-All Urban Consumers (Series ID: CUUR0000SAO). As discussed above in Condition #14, MADEP may require that Project Owner make "Modifications and Adjustments" to the fish passage facilities to improve their efficacy both before and after January 1, 2014. Any costs: i) of such "Modifications and Adjustments"; ii) of facilities ordered under this 401 Certification; iii) to protect threatened or endangered species; iv) to comply with any changes to MADEP Water Quality Standards; or v) of studies described in the next paragraph shall not count toward the inflation-adjusted \$350,000 cost cap.

Throughout the term of the license, Project Owner shall cooperate with MADEP, MADFW and other agencies with respect to the performance of studies related to habitat, minimum flows, and fish passage facilities, and to expedite improvements, including without limitation, reviewing fish passage efficacy, identifying problems with existing facilities, and discussing, designing and implementing solutions. Project Owner shall pay all reasonable costs of reasonably-required studies of such issues in a timely fashion. In order to avoid delay in installation of new facilities, the Project Owner shall cooperate with MADEP, MADFW and other agencies in the design and performance of studies to determine what, if any, modifications to existing minimum flows and fish passage facilities, or new fish passage facilities are necessary at the Holyoke Project.

After January 1, 2014, for the remainder of the FERC license, MADEP may amend the certificate as it relates to fish passage facilities to the extent allowed by then-existing law, and the provisions of this condition shall not apply.

19. Riparian Management Plan

(a) Within one year of certification, the Project Owner shall submit a riparian management plan to MADEP. The plan shall address the protection of water quality and designated uses including fishery and wildlife habitat, and primary and secondary contact recreation, from adverse impacts and degradation caused by development and use as a result of the Project. The plan shall encompass all riparian land extending the length of the FERC project boundary as of July 28, 1999, as shown generally on the map attached hereto, at a minimum of within 200 feet of the Connecticut River around and above the

Holyoke Dam (extending horizontally from 0.2 feet above the normal pond elevation) (hereinafter referred to as "Project Boundary"). The plan shall, without limitation:

(i) Specify how a riparian zone adequate to protect water quality and designated uses will be established around the perimeter of the Project impoundment, specifically addressing how long term conservation of important riparian areas will be assured as needed to achieve this objective;

(ii) Specify allowable uses within the proposed riparian zone, and how conflicts among uses will be minimized to protect water quality, fisheries, wildlife, and recreational values of the river and associated riparian lands;

(iii) Specify how and where the Project Owner will provide access to Project waters for swimming, boating and fishing in a way that is compatible with other designated uses and values; and

(iv) Specifically propose how the plan will be implemented. The plan shall be developed in consultation with MADFW, the MADEM, the USFWS, the City of Holyoke, the Town of South Hadley, the Connecticut River Watershed Council and other interested organizations. The Project Owner shall implement the plan as approved by MADEP on the Project property owned by HWP as of July 28, 1999.

(b) The riparian zone shall be sufficient to:

(i) Serve as a vegetative filter to substantially reduce non-point source discharges of oil and grease, sediment, nutrients and fertilizers, pesticides, and other contaminants that may be transported to Project waters in overland runoff from existing or potential adjacent residential, commercial or agricultural uses or roads;

(ii) Protect near shore fish, aquatic life and wildlife habitat from degradation resulting from adjacent uses and disturbances and from alterations to the shoreline including docks, riprap, and other structural modifications;

(iii) Include significant wildlife habitats and buffers adequate to avoid disturbance from adjacent uses, for species utilizing Project waters and associated wetlands, including but not limited to rare, threatened, or endangered wildlife species, or other state or federally listed species of concern; and

(iv) Protect riparian habitat areas and buffers for species which use the riparian area in conjunction with Project waters, including turtle nesting areas, and bald eagle perch trees used for feeding; and

(v) Include riparian areas of significant recreational value as points of public access to Project waters for primary and secondary contact recreation.

To the extent the Land and Buffer Zone Management Plans required by Article 418 of the federal operating license and approved by FERC include and address all elements required by this condition, those plans may be submitted to MADEP as the Riparian Management Plan.

20. Sale of Land Within Riparian Zone

The HWP shall notify MADEP and MADEM in writing prior to any sale if its lands within the Project Boundary. The HWP shall provide all purchasers of such lands with a copy of the Riparian Management Plan.

21. Additional Plans

(a) The Project Owner shall cooperate with MADEP with respect to monitoring, control and elimination of invasive species (including but not limited to zebra mussel and water chestnut) within the Project Boundary. The Project Owner shall consult with and submit a plan setting forth the Project Owner's proposed activities with respect to monitoring, control, and elimination of invasive species to MADEP, MADFW, USFWS, MADEM and the Silvio O. Conte National Fish and Wildlife Refuge. The Project Owner shall implement the plan as approved by MADEP. The plan should identify appropriate remedial measures to control such species.

(b) The Project Owner shall cooperate with MADEP with respect to the protection, enhancement and management of animals and plants within the Project Boundary that are listed as protected under the Massachusetts Endangered Species Act. Within one year of certification, the Project Owner shall submit a plan setting forth activities the Project Owner proposes to protect, enhance and manage animals and plants within the Project Boundary that are listed as protected under the Massachusetts Endangered Species Act. The Project Owner shall consult with MADEP, MADFW, USFWS, MADEM and the Silvio O. Conte National Fish and Wildlife Refuge while developing the plan. The Project Owner shall implement the plan as approved by MADEP. The plan shall identify safeguards to avoid conflicts between recreational users and protection of populations of rare and endangered species and specify how lands within the Project Boundary will be managed to protect natural resources.

22. Water Sampling Standard Operation Procedures

Within three months of certification, the Project Owner shall begin working cooperatively with MADEP to develop standard operating procedures for water quality sampling. The operating procedures developed shall be consistent with the Water Quality Sampling Plan previously submitted by Project Owner to FERC. Project Owner shall

abide by the final Water Quality Sampling Plan and Standard Operating Procedures as approved by MADEP.

23. **Force Majeure**

If any event occurs which delays or will delay the Project Owner's performance of work beyond a deadline established by or pursuant to this Certification, which event was beyond the reasonable control and without the fault of the Project Owner or any person or entity subject to the Project Owner's control, and which event could not have been prevented or avoided by the exercise of due care, foresight, or due diligence on the part of the Project Owner (a "force majeure event"), then the time for performance shall be extended for an appropriate period of time, as determined by MADEP in its sole discretion, no longer than the delay resulting from such event. The Project Owner shall bear the burden of demonstrating that a force majeure event has occurred or will occur, and that the delay was beyond the reasonable control and without the fault of the Project Owner. Such an extension of time must be in writing to have effect.

APPENDIX B – Terms and Conditions of NOAA Fisheries’ Incidental Take Statement

Reasonable and Prudent Measures

NOAA Fisheries believes the following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize impacts of incidental take of shortnose sturgeon in the Connecticut River resulting from the existence and operation of the Holyoke Dam under the terms of the new license:

1. Shortnose sturgeon must be collected and handled appropriately at the downstream sampling station and in the event of a stranding. In addition, such interactions must be reported to NOAA Fisheries.
2. Water quality in the holding tanks at the downstream sampling station must be adequate for holding shortnose sturgeon.

Terms and Conditions

In order to be exempt from prohibitions of section 9 of the ESA, the licensee must comply with the following terms and conditions, which implement the reasonable and prudent measures described above, and outline required reporting/monitoring requirements.

1. To implement RPM #1, the licensee must follow the shortnose sturgeon handling plan (*see* Appendix F to this order).
2. To implement RPM #1, by January 1 of each year, the licensee must discuss with NOAA Fisheries whether any updates to the shortnose sturgeon handling plan are necessary. If required, all updates must be made by April 1 of each year.
3. To implement RPM #1, by January 1 of each year, the licensee must submit a report to NOAA Fisheries on the status of shortnose sturgeon at the Holyoke Project, including the numbers of identified sturgeon passing upstream (and downstream), if detected, the number of sturgeon rescued from the apron pools, the relative effectiveness of fishways, and mortality from the previous year.
4. To implement RPM #1, the licensee must notify NOAA Fisheries when the Holyoke Project reaches 75 per cent of the incidental take levels for shortnose sturgeon, including upstream migrating, downstream migrating, and fish stranding below the dam levels.

5. To implement RPM #2, the licensee must monitor the water quality of the holding tanks used at the downstream sampling facility. Personnel must ensure that no shortnose sturgeon are held for longer than 12 hours, that water depth is sufficient, that water temperature does not exceed 27° celsius and that dissolved oxygen levels are at least 5 milligrams per liter at all times.

APPENDIX C – Parts III and IV of the Settlement Agreement Filed on March 12, 2004

Part III – General Provisions

Section 3.1. Effective Date and Term. The Settlement shall be effective as of the date of the Final FERC Order Approving Settlement and shall continue through the term of the license under the 1999 License Order (*i.e.*, until August 31, 2039), except as provided under Section 3.2 hereof. This Settlement shall terminate as to all Parties and have no further force or effect upon expiration of the term of the license under the 1999 License Order.

Section 3.2. Amendment to the Settlement. If, after the Settlement becomes effective pursuant to Section 3.1 above, all of the Parties agree that circumstances have changed sufficient to require an amendment to the Settlement, the Parties shall execute an amendment to the Settlement reflecting that agreement and shall jointly petition the FERC to amend the License Articles affected by the amendment to the Settlement, as necessary.

Section 3.3. Consultation on Plans/Work under the Settlement. With respect to a plan, modification to a plan, or work to be undertaken pursuant to Part IV of the Settlement, HG&E shall first provide a draft of such plan, modification to a plan, or description of work to the Resource Agencies, TU, and CRWC (and with South Hadley for certain plans, as defined in Section 4.10 below), providing a minimum of 30 days for review, comment and recommendations prior to filing the plan with the FERC and the MADEP. Prior to filing the plan or description of work with the FERC and the MADEP, HG&E shall obtain the concurrence and/or approval of that plan/work from the agency or agencies as follows: (1) FWS and/or NOAA Fisheries for a plan/work which may impact a resource for which FWS and/or NOAA Fisheries have responsibilities under the Endangered Species Act (16 U.S.C. §1531, *et seq.*); (2) MADFW and/or MADEP for a plan/work which the MADFW and MADEP have responsibilities under the Massachusetts Endangered Species Act (M.G.L. c. 131A); (3) MADEP for a plan/work that is required by the 2001 WQC; and/or (4) FWS and/or NOAA Fisheries for all decisions on measures needed for fish passage, fish passage design drawings, and fish passage implementation schedules for which the FWS and/or NOAA Fisheries have specific statutory responsibility under the Federal Power Act (with such concurrence and/or approval not unreasonably withheld, and with any refusal to concur/approve to be based on sound science). For any plan/work that is subject to the jurisdiction of the U.S. Army Corps of Engineers, HG&E shall ensure that arrangements are included in such plan/work to obtain all necessary permits or authorizations.

HG&E and all consulted Parties agree to make a good faith effort to reach consensus on all plans pursuant to Part IV of the Settlement before HG&E files such plans at the FERC for approval and at the MADEP for approval when required by the 2001 WQC. HG&E shall include with the filing with the FERC and the MADEP documentation of consultation; copies of comments and recommendations on the proposed plan, modified plan and/or work after it has been prepared and provided to the Resource Agencies and the Parties consulted, and specific descriptions of how the comments are accommodated by HG&E's proposed plan and/or work. If HG&E does not adopt a recommendation by a Resource Agency or other Party [other than a recommendation by a Resource Agency(ies) from which HG&E shall obtain prior concurrence and/or approval, as described in (1), (2), (3) and (4) above], the filing shall include HG&E's reasons, based on project-specific information. All plan(s)/work shall be implemented as approved in writing by FERC and by MADEP (when required by the 2001 WQC).

Part IV – Technical Agreements

Section 4.1. Modified Run-of-River Operations.

Section 4.1(a). Objective: The objective of Section 4.1 is for HG&E to evaluate and implement a modification to the run-of-river provisions (contained in Article 405 of the 1999 License Order and Condition 9 of the 2001 WQC) in order to limit adverse Project impacts on the federally threatened and state endangered Puritan tiger beetle.

The need for the modification to the existing Run-of-River Operations is based on operating experience to date which indicates that Run-of-River Operations as required by the 1999 License (and Condition 9 of the 2001 WQC) exacerbate fluctuations at Rainbow Beach and other habitat areas for the Puritan tiger beetle upstream of the Holyoke Dam, which fluctuations may be detrimental to the restoration and protection of this species. Therefore, the Parties have agreed that the existing Run-Of-River Operations need to be modified to more effectively limit fluctuations in the Impoundment as a result of Project operations; the process for determining the appropriate modifications is set forth below.

The Parties recognize that such a modified operating regime must take into account and achieve multiple goals as stated in (b)(1) below. The Parties further intend that any modifications to Project operations shall not adversely impact fish passage, result in the stranding (as defined in Part I above) of fish, or otherwise adversely impact fish species, and that HG&E shall not change the releases into the Bypass Reach for Bypass Habitat Flows and Bypass Zone-of-Passage Flows without agreement of the Parties under the procedures set forth below.

Section 4.1(b). Test of modified run-of-river operations:

Section 4.1(b)(1): For testing modified run-of-river operations, HG&E shall consult with the Parties pursuant to Section 3.3 above to investigate an alternative operating regime: (i) to more effectively limit water level fluctuations in the Impoundment at Rainbow Beach and at other habitat areas for the federally threatened and state endangered Puritan tiger beetle upstream of the Project; (ii) to prevent injury or significant impairment to essential behavioral patterns to federally and state endangered shortnose sturgeon; (iii) to balance the magnitude of the fluctuations in the lower and upper sections of the Impoundment; (iv) to balance the impact on wetland areas adjacent to the lower and upper sections of the Impoundment; (v) to maintain the seasonally adjusted minimum flows into the bypass reach and the canal system as stated in Section 4.2 of this Settlement; and (vi) to the extent possible, reduce fluctuations in river flows downstream of the Project.

Section 4.1(b)(2): Based on consultation under Section 4.1(b)(1) above, HG&E filed with FERC and the MADEP a plan to test the modified run-of-river operations to evaluate the proposed alternative operating regime with the elements listed below. The plan [as approved as part of the COFP by FERC on June 24, 2003 (103 FERC ¶ 62,178), and by MADEP on October 6, 2003] shall be implemented as approved by the FERC and the MADEP. The plan includes:

- (i) Consultation by HG&E with the Parties pursuant to Section 3.3 above to identify the Resource Agencies' objectives related to the goals stated in Section 4.1(b)(1) above;
- (ii) A provision pursuant to which HG&E would perform hydraulic model studies to evaluate effects of various operating regimes relative to the stated resource goals identified under (i) above;
- (iii) Consultation by HG&E with the Parties pursuant to Section 3.3 above to develop a preferred operating regime and compliance measures that balance HG&E operation constraints and the resource goals identified in (i) above;
- (iv) Implementation and monitoring by HG&E of the preferred operating regime determined under (iii) directly above for a trial period of 12 months from the date of implementation, with a provision for continuation of the testing for up to an additional 12 months, if the Resource Agencies and HG&E agree that River conditions in the Impoundment during the test period were not representative of typical River flow conditions;

- (v) If, during the testing of the modified run-of-river operations, HG&E is unable to meet the Bypass Habitat Flows or the Bypass Zone-of-Passage Flows described herein, HG&E shall: (A) provide notification to the Parties within 24 hours, (B) revert immediately to the applicable Bypass Habitat Flow or Bypass Zone-of-Passage Flow, and (C) consult with the Parties pursuant to Section 3.3 above to modify or terminate the test of the modified run-of-river operations;
- (vi) Using the data collected during the trial period, HG&E shall prepare the following evaluations: (a) an evaluation of the effects of the modifications to the run-of-river operations on the federally and state threatened and endangered species; (b) a determination of any appropriate revision to the Threatened and Endangered Species Protection Plan (including any necessary changes to reflect state listed species); (c) a determination of measures as appropriate to avoid adverse impacts to the federally and state endangered shortnose sturgeon, including stranding in the Bypass Reach (see the Shortnose Sturgeon Handling Plan, attached as Appendix E); (d) an evaluation of how the modifications to the run-of-river operations affected HG&E's ability to achieve flow elevations in the Bypass Reach (*i.e.*, Bypass Habitat Flows and Bypass Zone-of-Passage Flows pursuant to Section 4.2 below); (e) a recommendation, if necessary, to modify the Texon Gage as a compliance measure for Bypass Habitat Flows and Bypass Zone-of-Passage Flows pursuant to Section 4.2 of this Settlement; (f) an evaluation of how the modifications to the run-of-river operations affect wetland areas adjacent to the lower and upper sections of the Impoundment; (g) an evaluation of impacts of modified run-or-river operations on downstream flow fluctuations; and (h) to the extent possible, proposed measures to reduce fluctuations in river flows downstream of the Project;
- (vii) Circulation by HG&E of the results of the test of modified run-of-river operations and evaluations performed under the plan to the Parties pursuant to Section 3.3 above and consultation on a proposed long-term resolution of the issue.

Section 4.1(c). Permanent modification to run-of-river operations: Based on the results of the test of modified run-of-river operations and evaluation of results pursuant to Section 4.1(b) above, and upon agreement by the Parties pursuant to Section 3.3 above, on or before November 30, 2004 [or within 3 months after any extension of the test period by written agreement of HG&E and the Resource Agencies pursuant to Section 4.1(b)(2)(iv) above], HG&E shall file with FERC and the MADEP: (i) a report containing the results of the test of modified run-of-river operations and the evaluations performed under the plan, and any comments from the consulted Parties (pursuant to Section 3.3 above); and (ii) a proposed amendment to the COFP for a modified operating

protocol. Copies of the report and proposed amendment shall also be provided to the Resource Agencies, TU and CRWC. The modified run-of-river operations shall be only implemented as approved in writing by the FERC and MADEP.

Section 4.2. Bypass Flows.

Section 4.2(a). Objective: The objective of Section 4.2 is to have HG&E release seasonally-adjusted minimum flows into the Bypass Reach, correlated to the Texon Gage, for: (1) the protection and enhancement of water quality and aquatic and fisheries resources (Bypass Habitat Flows); and (2) effective flows for migratory fish passage (Bypass Zone-of-Passage Flows). This provision is based on Article 406 of the 1999 License Order and Conditions 11(a) and 11(b) of the 2001 WQC. HG&E agrees to make good faith effort to meet the flow elevations in this Section during the test period under Section 4.1(b) above. If, during the testing of the modified run-of-river operations, HG&E is unable to meet the Bypass Habitat Flows and Bypass Zone-of-Passage Flows described herein, HG&E shall: (i) provide notification to the Parties within 24 hours; (ii) revert immediately to the applicable Bypass Habitat Flow or Bypass Zone-of-Passage Flow; and (iii) consult with the Parties pursuant to Section 3.3 above to seek agreement on a procedure to modify or terminate the test of the modified run-of-river operations.

Section 4.2(b). Bypass Zone-of-Passage Flows: The goal of Bypass Zone-of-Passage Flows is to provide flows sufficient so that diadromous and resident fish can safely and successfully pass without injury or significant impairment to essential behavioral patterns. Based upon best scientific information presently available, the Parties agree that this goal can be reached by achieving the water surface elevations in the Bypass Reach that correspond to the 1997 Barnes & Williams IFIM Study of 1300 cfs flow as measured in the Bypass Reach. The Parties further agree that the 1300 cfs flow is achieved for compliance purposes by flows corresponding to a water surface elevation of 62.85 +/- 0.1 feet NGVD at the Texon Gage. The Bypass Zone-of-Passage Flows will be released whenever the Fish Lifts are operational as set forth in Section 4.5(b) below, unless for the purposes of resident fish only the Parties agree that lesser Bypass Zone-of-Passage Flows are appropriate for resident fish passage.

Section 4.2(c). Channel modifications: Based on Article 407 of the 1999 License Order and Condition 11(c) of the 2001 WQC and after consultation with the Parties, HG&E developed and implemented channel modifications to the Holyoke (West) Channel of the Bypass Reach in March 2003 to address fish passage/stranding issues. HG&E shall implement the study plan for evaluating the effectiveness of the Channel modifications for fish passage as approved by FERC as part of the COFP on June 24, 2003 (103 FERC ¶ 62,178), and filed with the MADEP on January 20, 2003.

Section 4.2(d). Interim Bypass Habitat Flows: The goal of Interim Bypass Habitat Flows is to provide flows sufficient for the protection and enhancement of water quality

and aquatic and fisheries resources. This provision is based on Article 406 of the 1999 License Order and Condition 11(d) of the 2001 WQC. The stated goal will be reached by achieving the water surface elevations in the Bypass Reach which correspond to the 1997 Barnes & Williams IFIM Study of 840 cfs flow as measured in the Bypass Reach, until Permanent Bypass Habitat Flows are determined pursuant to Section 4.2(e) below. The Parties further agree that the 840 cfs flow is achieved for compliance purposes by flows corresponding to a water surface elevation of 62.3 +/- 0.1 feet NGVD at the Texon Gage. The Interim Bypass Habitat Flows will be released whenever the Fish Lifts are not operational as set forth in Section 4.5(b).

Section 4.2(e). Permanent Bypass Habitat Flows: The intent of this Section is to determine surface elevations correlated to the Texon Gage for the Permanent Bypass Habitat Flows for normal operations and maintenance conditions at the Project for the protection and enhancement of water quality and aquatic and fisheries resources. This provision is based on Article 406 of the 1999 License Order and Condition 11(d) of the 2001 WQC. The permanent measure of compliance for Bypass Habitat Flows shall be the Interim Bypass Habitat Flows as specified in Section 4.2(d) above as adjusted and modified pursuant to this Section 4.2(e). The Permanent Bypass Habitat Flows will be released whenever the Fish Lifts are not operational as set forth in Section 4.5(b).

Section 4.2(e)(1): After consultation with the Parties HG&E developed a study plan for flow demonstrations to evaluate water surface elevations, the distribution of flows in the Bypass Reach, channel modifications already completed. Flow demonstrations and evaluations will occur after the Spring 2004 Upstream Passage Season. Flow demonstrations and evaluations shall be performed for normal operating conditions (*i.e.*, with releases through the Bascule Gate on the Holyoke side of the Project Dam) and maintenance conditions (*i.e.*, with releases through Rubber Dam Section No. 1 on the South Hadley side of the Project Dam, when the Bascule Gate is out of service).

Section 4.2(e)(2): Following the flow demonstrations and evaluations under Section 4.2(e)(1) above, and in consultation with the Parties pursuant to Section 3.3 above, HG&E shall determine if any Channel modifications for flow distributions or changes to the Interim Bypass Habitat Flows are necessary to provide an adequate water level for fish habitat. The Parties agree that the Permanent Bypass Habitat Flow determined pursuant to this Section 4.2 provides flows in each of the three channels of the Bypass Reach that achieve an adequate water level for fish habitat and prevent any adverse impacts to federally and state endangered shortnose sturgeon, including stranding in the channels of the Bypass Reach.

The Parties agree that this goal will be reached by achieving the water surface target elevations from the 1997 Barnes and Williams study for each of the three channels in the Bypass Reach. Based on the analysis of the additional flow demonstrations in 2004 and the testing of modified run-of-river operations, and in consultation with the Parties

pursuant to Section 3.3 above, if necessary HG&E shall file an application to amend the License for the Project to implement the Permanent Bypass Habitat Flows and shall file by December 31, 2004, for written approval from MADEP, as set forth in Section 4.1(c) above. HG&E shall only implement Permanent Bypass Habitat Flows as approved in writing by MADEP and FERC.

Section 4.3. Canal System Flows.

Section 4.3(a). Objective: The Objective of Section 4.3 is to have HG&E release seasonally-adjusted minimum flows into the Canal System for the protection and enhancement of water quality and aquatic and fisheries resources. This section is based on Article 406 of the 1999 License Order and Condition 13 of the 2001 WQC.

Section 4.3(b). Interim Canal System minimum flows: HG&E shall provide a continuous minimum flow into the Canal System, downstream of the louver bypass facility, of 400 cfs, consistent with the CCOP [approved by FERC on June 5, 2003 (103 ERC ¶ 62,130)], with the COFP [approved by FERC on June 24, 2003 (103 FERC ¶ 62,178)], and with Condition 13(a) of the 2001 WQC. HG&E will use generation records (consistent with the form and content of what is filed at the FERC for the period in question) and unit rating curves to demonstrate compliance with canal minimum flow requirements.

Section 4.3(c). Permanent Canal System minimum flows: Based on Article 409 of the 1999 License Order and Condition 13(b) of the 2001 WQC, in consultation with the Parties pursuant to Section 3.3 above, HG&E developed a plan to establish permanent compliance measures to ensure a 400 cfs continuous minimum flow into the Canal System downstream of the louver facility. The plan was filed with MADEP in December 2003 and includes the following:

- (i) HG&E to use head gate openings and pond elevations to determine the quantity of flow (calculated from gate opening/discharge relationships) and flow measurements in the First Level Canal (using new flow measurement equipment installed in the First Level Canal) to ensure adequate flow distribution;
- (ii) HG&E to consult with the Parties pursuant to Section 3.3 above to develop permanent compliance measures for minimum flows in the Canal System;
- (iii) HG&E to prepare and circulate to the Parties pursuant to Section 3.3 above a plan to establish permanent compliance measures for minimum flow in the Canal System;

- (iv) On or before June 30, 2004, HG&E to file with the FERC and the MADEP the permanent compliance measures as a revision to the CCOP as necessary; and
- (v) If significant modifications are made by HG&E or any other entity on the Canal that could change leakage or the distribution of flow in the Canal System, HG&E to evaluate the magnitude and distribution of flows in the Canal System; then, in consultation with the Parties pursuant to Section 3.3 above, to propose to MADEP a revision to the permanent canal system minimum flow compliance measures contained in the CCOP as necessary to achieve the resource management objectives and the minimum flow requirements set forth in Section 4.3 above as agreed to pursuant to Section 3.3 above.

HG&E shall implement the CCOP and any revisions thereto relating to permanent compliance measures for minimum flow in the Canal System as approved in writing by the FERC and the MADEP.

Section 4.3(d). Interim Canal System Outage: Consistent with Condition 13(c) of the 2001 WQC and consultation with the Parties, for the Fall 2003 Canal System Outage HG&E operated under the canal drawdown provisions as filed at FERC on August 15, 2003. Based on the Fall 2003 Canal System Outage, HG&E provided to the Parties a report that addressed the following:

- (i) Evidence of minimum flows through the headgates sufficient to ensure that the pool between Boatlock and Riverside (see Figure No. 1 above) remains at an elevation equal to the Riverside Station intake sill elevation and at ambient river temperature throughout the drawdown period;
- (ii) Evidence of sufficient flows from the headgates (see Figure No. 1 above) to provide water in the First Level Canal (once maintenance is completed) to protect the state listed endangered yellow lampmussel at the lower end of the louvers;
- (iii) Evidence that the No. 3 Overflow (see Figure No. 1 above) remains closed until the end of the Canal System Outage period, at which time it may be opened for inspection and maintenance;
- (iv) Evidence of measures for the protection of mussels if heavy machinery is used in the Canal during the Canal System Outage;

- (v) A plan for evaluation of the experimental weir in the First Level Canal to determine if it retains water and to develop and implement plans to modify as required; and
- (vi) A plan for evaluation of the need for additional weirs to keep mussel habitat areas watered.

Section 4.3(e). Permanent Canal System Outage: Based on the evaluations of the Spring and Fall 2004 Canal System Outages, HG&E shall consult with the Parties pursuant to Section 3.3 above to modify the drawdown procedures, experimental weir, and any additional weirs, to the extent necessary to protect and enhance mussel species including the federally and state listed endangered dwarf wedgemussel and the state listed endangered yellow lampmussel, and to generally ensure sufficient flows into the Canal System during the outages for the protection and enhancement of water quality and aquatic and fisheries resources.

HG&E shall file with FERC and the MADEP the final Canal System Outage plan, as a revision to the CCOP on or before January 31, 2005. That plan shall be implemented by HG&E as approved in writing by FERC and MADEP. The Canal System Outage plan shall include provisions implemented in the Spring and Fall 2004 Canal System Outage (as stated in Section 4.3(d) above), the evaluation and potential installation of a permanent weir in 2005 and/or additional weirs as necessary, and update the matters addressed in the 2004 report. HG&E shall notify all Canal water users and Resource Agencies prior to any Canal System Outage.

Section 4.3(f). Full depth louvers and exclusion racks: Consistent with Conditions 13(d), 13(e) and 14(a) of the 2001 WQC, and the CCOP as approved by the FERC, HG&E shall continue to operate, clean and otherwise maintain the full depth louvers in the First-Level Canal and the exclusion racks at the attraction water intake gates to ensure efficient and reliable operation of these facilities for the protection of aquatic resources. HG&E shall annually inspect the full depth louvers and exclusion racks, and repair them as necessary. In the event the full depth louver facility is out of service during the Upstream Passage Season (as defined in Part I above), the Canal System will not be operated and the headgates will be closed to seal flows into the Canal. If necessary, at the end of the Upstream Passage Season a slow drain of the Canal will be performed to return any fish to the River.

In the unlikely event of a failure of the canal louver bypass system, HG&E shall shut the Canal down. If there is a structural failure of the louver panels, HG&E shall implement a slow drawdown process to allow any fish in the Canal downstream of the louver facility to return to the River. As described below, the process consists of: (i) notification, and (ii) slow draining of the canal system.

- (i) Notification: HG&E shall notify MADFW, USFWS and NOAA Fisheries within 24 hours of the louver bypass system outage.
- (ii) Slow Drain: The No. 1 Overflow attraction water gate will be cracked to drain the First Level Canal; the No. 2 Overflow gates will be cracked to drain the 'upper' section of the Second Level Canal, and the Riverside Station sluice gate will be cracked to drain the 'lower' portion of the Second Level Canal. HG&E shall monitor the Canal System during the slow drain process and regulate the drain gates as required to allow fish to exit the Canal System.

In conjunction with the slow drain process, HG&E shall make all reasonable efforts to expedite repairs to the louver bypass and return the facility to service.

Section 4.3(g). Effectiveness study for full depth louvers (surface migrants):

Consistent with Condition 14(c)(1) of the 2001 WQC and the CCOP (as approved by FERC and MADEP), and in consultation with the Parties, HG&E developed an effectiveness study plan for the full depth louvers as they affect surface migrants. This plan was filed at MADEP on January 31, 2003; HG&E shall implement the plan as approved by the MADEP. The study results regarding facility effectiveness shall be circulated to the Parties pursuant to Section 3.3 above and filed with the FERC and the MADEP no later than July 1, 2004. The effectiveness of the full depth louvers to pass surface migrants will be evaluated based on whether velocities measured during guidance testing of surface migrants at the partial depth louvers have changed with the addition of bottom louver sections. If based on the louver effectiveness studies described in this section, and any other relevant information in the record of this proceeding, HG&E and the Parties determine, in consultation pursuant to Section 3.3 above, that the full depth louvers are effective, HG&E may close the Boatlock Station Bypass.

Section 4.4. Flow Prioritization and Low Flow Contingency Plan.

Section 4.4(a). Objective: The objective of Section 4.4 is to have HG&E follow an approved plan for operating the Project and for releasing flows at the Project. This section is consistent with Condition 12 of the 2001 WQC.

Section 4.4(b). Project flows – flow prioritization: HG&E shall operate the Project in accordance with the flow prioritization plan as outlined in Conditions 12(a) and 12(b) the 2001 WQC. Any modification to this prioritization shall be filed with FERC and MADEP as a proposed revision to the COFP. HG&E shall only implement the revisions as approved in writing by the FERC and the MADEP.

Section 4.4(c). Low Flow Contingency Plan: HG&E shall operate consistent with the Low Flow Contingency Plan as set forth in Section 3.3 of the COFP and as required by Condition 12(c) of the 2001 WQC. The Low Flow Contingency Plan directs Project

operations and prioritization for flows in the Canal System, specifically to protect the federally and state listed endangered dwarf wedgemussel and the state listed endangered yellow lampmussel.

Section 4.5. Upstream Fish Passage – Phase I:

Section 4.5(a). Objective: The objective of Section 4.5 is to ensure that diadromous and resident fish are able to safely and successfully pass upstream of the Project without injury or significant impairment to essential behavioral patterns. The Parties agree that this objective is achieved by HG&E operating, maintaining and enhancing upstream fish passage facilities at the Project for diadromous and resident fish as described below. This section is based on Article 412 of the 1999 License Order and Condition 14 of the 2001 WQC. The existing upstream fish passage facilities include the attraction water system, the tailrace entrance and lift tower and the spillway entrance and lift tower, the spillway transport channel, the entrance flume with the fish trapping and viewing station, the exit flume, and the fish exit channel. HG&E shall consult with the Parties pursuant to Section 3.3 above with respect to the analysis, design, construction, operation, and effectiveness evaluation of upstream fish passage facilities as described in this Section 4.5.

Section 4.5(b). Operation of Fish Lifts: Based on Article 412 of the 1999 License Order and Condition 14(d) of the 2001 WQC, HG&E shall operate the Fish Lifts for upstream passage during the April 1 through November 15 Upstream Passage Season, as defined in Part I above. However, the Fish Lifts shall be not be operated during the period July 15 through September 15 until such time as: (i) NOAA Fisheries determines that upstream passage of federally and state endangered shortnose sturgeon over the Dam is appropriate; or (ii) MADFW and FWS determine that resident fish passage is necessary. When shortnose sturgeon appear at the Fish Lifts, HG&E shall follow the Shortnose Sturgeon Handling Plan (attached as Appendix E, as modified based on an annual review of the Plan). Specific dates and hours of operation of the Fish Lifts during the periods stated above will be determined by MADFW in consultation with HG&E in accordance with Condition 14(d) of the 2001 WQC, and in consultation with NOAA Fisheries once upstream passage of shortnose sturgeon is implemented.

Section 4.5(c). No. 2 Overflow: Based on Condition 14(a)(3) of the 2001 WQC and Section 2.1 of the UFPP filed with FERC and MADEP on November 1, 2002, HG&E has implemented specific measures and modifications to the operating procedures, as necessary, to operate the No. 2 Overflow in such a manner to avoid releasing water during the April 1 through November 15 Upstream Passage Season when the Fish Lifts are operational as described in Section 4.5(b) above by implementing the procedures that prohibit operation of the No. 2 Overflow during that period when the Fish Lifts are operational (see No. 2 Overflow Procedures, attached as Appendix D). On December 26, 2003, HG&E filed a report documenting such actions with the FERC and the MADEP as a supplement to the COFP.

Section 4.5(d). Work prior to Spring 2003 Upstream Passage Season: Based on Article 412 of the 1999 License Order, and consistent with Condition 14(a) of the 2001 WQC and Section 7.1 of the UFPP, in consultation with the Parties prior to the Spring 2003 Upstream Passage Season HG&E has: (1) installed the modified gate insert in the west tailrace entrance to improve flows for fish passage; (2) made modifications to the Holyoke (West) Channel in the Bypass Reach to reduce stranding of upstream migrants per Section 4.2(c) of the Settlement; (3) improved the “V Gate” in the tailrace entrance gallery to reduce shad milling; and (4) increased the elevation of the area above the Hadley Falls Station draft tubes to provide for operation up to 40,000 cfs river flow. The Parties agree that such work was appropriate, necessary and in the public interest.

Section 4.6. Upstream Fish Passage – Phase II:

Section 4.6(a). Objective: The objectives of Section 4.6 are: (1) to have HG&E operate and maintain upstream fish passage facilities at the Project that safely and successfully pass diadromous and resident fish without injury or significant impairment to essential behavioral patterns; and (2) to complete the installation of Fish Lift improvements by the 2005 Fish Passage Season. This provision is based on Article 412 of the 1999 License Order and Conditions 13(b), 13(e), 14 and 15 of the 2001 WQC. HG&E shall consult with the Parties pursuant to Section 3.3 above with respect to the analysis, design, construction, operation, and effectiveness evaluation of Phase II upstream fish passage facilities as described in this Section 4.6.

Section 4.6(b). Plans and Schedule:

Section 4.6(b)(1). Detailed Plan and Schedule: In consultation with the Parties pursuant to Section 3.3 above, and consistent with the UFPP and 2001 WQC Conditions 14(a), 14(b), 14(h) and 14(j), HG&E filed plans on December 26, 2003 and February 1, 2004 for Upstream Fishway Construction Phase II, containing the elements listed in Section 4.6(c) below. HG&E shall implement the plan as approved in writing by the FERC and the MADEP.

Section 4.6(b)(2). Final Detailed Plan and Schedule. Upon completion of the bid cycle and before commencement of construction HG&E shall consult with the Parties, pursuant to Section 3.3 above, to develop a Final Detailed Plan and Schedule consistent with the UFPP and 2001 WQC Conditions 14(a) and 14(b) and that incorporate the general contractor’s plan and schedule for construction of the enhancements to the Upstream Fish Passage facilities. Prior to start of construction, HG&E shall file the Final Detailed Plans and Schedule, as approved by FWS and NOAA Fisheries, with the FERC and MADEP. HG&E shall implement the plan as approved in writing by the FERC and the MADEP.

Section 4.6(c). Contents of Detailed Plan: The detailed plan prepared and filed pursuant to Section 4.6(b)(1) above included:

- (i) Replacement of the tailrace lift tower, auxiliary equipment and hopper to accommodate 33 cubic feet per minute capacity.
- (ii) Replacement of the spillway tower, auxiliary equipment and hopper to accommodate 46 cubic feet per minute capacity.
- (iii) Increase the width of the spillway transport channel to an average width of 6 feet.
- (iv) Modifications to the exit flume to accommodate the new spillway lift location.
- (v) Increase the width of the fish exit channel up to a maximum of 14 feet between the lift towers and the fish counting station (see Figure No. 3, attached hereto).
- (vi) Installation of a high capacity adjustable drain valve in the flume.
- (vii) Addition of a second fish trap and viewing window in the exit flume.
- (viii) Expansion of the fish counting station to include both fish traps.
- (ix) Modification of the fish trapping and hauling system to improve the work area and minimize hoisting and netting of fish.
- (x) Modification of the attraction water supply system to provide up to 200 cfs at the spillway entrance and 120 cfs at each of the tailrace entrances.

In addition, the plan included:

- (1) A schedule that provides for construction to begin in 2004 and be completed prior to the start of the Spring 2005 Upstream Passage Season;
- (2) Milestones to identify target completion dates for key components to ensure compliance with Spring 2005 Upstream Passage Season requirements; and
- (3) Contingency plans for unexpected delays in construction. If, by November 1, 2004, it is determined that HG&E will not meet the start of the operation of the Fish Lifts pursuant to Section 4.5(b) above, or the planned construction is substantially behind schedule, then HG&E shall promptly consult with the Parties (no later than November 30, 2004) to develop and agree on

alternatives for Fish Lift operations for the Spring 2005 Upstream Passage Season.

Section 4.6(d). Effectiveness of upstream fish passage facilities:

Section 4.6(d)(1): The goal of the upstream fish passage facilities effectiveness testing is to determine whether diadromous and resident fish are able to safely and successfully pass upstream of the Project through the enhanced upstream fish passage facilities without injury or significant impairment to essential behavioral patterns. In consultation with the Parties pursuant to Section 3.3 above, HG&E shall prepare a proposed plan for the evaluation and monitoring of the effectiveness of upstream fish passage facilities for diadromous and resident fish species. Such plan shall include, but not be limited to, the following: (i) evaluation of operation and attraction flows; (ii) evaluation of the adequacy and effectiveness of the 7-foot-wide exit channel upstream of the counting station, the existing 4.5-foot-wide spillway entrance, and the existing 6-foot-wide spillway entrance channel to provide upstream fish passage (see Figure No. 3, attached hereto); (iii) evaluation of the ability to achieve the target design populations for upstream fish passage as described in Article 412 of the 1999 License Order; and (iv) annual reports to be distributed to the Parties by December 31st of each year.

On or before September 30, 2004, HG&E shall distribute the proposed plan to the Parties. On or before November 30, 2004, HG&E shall file the plan with MADEP and the FERC for approval. HG&E shall implement the plan as approved in writing by the FERC and the MADEP.

Section 4.6(d)(2)(A): By December 31, 2006, HG&E shall distribute a cumulative report of the study results to the Parties, which shall include conclusions and recommendations as to whether the goal as stated in Section 4.6(d)(1) above has been achieved. Within three months after distribution of the report, HG&E shall consult with the Parties pursuant to Section 3.3 above with respect to the study results.

Section 4.6(d)(2)(B): If the effectiveness study concludes that the upstream passage facilities and measures are not accomplishing the objective stated in Section 4.6(d)(1) above, or if the study does so conclude but the Resource Agencies do not concur, then HG&E shall develop plans to modify the facilities including, but not limited to, if necessary:

- (i) Increasing the width of the exit channel upstream of the counting station up to 10 feet;
- (ii) Increasing the width of the spillway entrance to 8 feet; and/or
- (iii) Increasing the width of the spillway entrance channel to 8 feet.

HG&E shall circulate such plans and a schedule for the implementation of the modifications to the Parties consulted and shall propose any modifications as a result of comments. After receiving affirmative concurrence from MADFW, FWS and NOAA Fisheries on the final proposed plans and schedule, HG&E shall file the final plans and schedule with the FERC (in the form of an application to amend the License for the Project) and with the MADEP (for approval consistent with Condition 14(c) of the 2001 WQC), that addresses the proposed changes to fishway operations or structures determined to be necessary to protect and enhance fish passage for diadromous and resident fish species. HG&E shall implement the plan for such modifications as approved in writing by FERC and the MADEP.

Section 4.6(d)(2)(C): If, based on such effectiveness study results, the Resource Agencies, in consultation with HG&E and the Parties, are unable to determine whether or not the new facilities are effective or what modifications are necessary to the facilities in order to provide adequate upstream fish passage, HG&E shall extend the plan for evaluation and monitoring of the effectiveness of upstream fish passage facilities for diadromous and resident fish species as approved under Section 4.6(d)(1) above for an additional year, with a report distributed to the Parties as set forth in Section 4.6(d)(1) above. Based on the extension of the effectiveness study, on or before December 31, 2007, HG&E shall prepare a cumulative report and follow the procedures in Section 4.6(d)(2)(B) above. If, after this one-year extension of the study the Parties are unable to determine whether or not the new facilities are effective or what modifications are necessary to the facilities in order to provide adequate upstream fish passage, then HG&E shall extend or schedule additional evaluation and monitoring as determined to be needed pursuant to consultation under Section 3.3 above.

Section 4.6(d)(3): If NOAA Fisheries, FWS, and/or MADFW determine, based on the study results under Section 4.6(d)(1) above, that modifying the spillway entrance to the upstream passage facilities and/or an adjustment to the attraction flows is necessary to safely and successfully provide upstream passage of shortnose sturgeon and other diadromous and resident species, HG&E shall implement the modifications as directed by NOAA Fisheries, FWS and/or MADFW, and as approved in writing, as necessary, by the FERC and MADEP.

Section 4.6(e). Annual Report and monitoring of the operation of upstream fish passage facilities: On or before January 31 of each year, HG&E shall submit to the Parties and the Connecticut River Atlantic Salmon Commission a report of the previous year's activities relative to the operation of the upstream passage facilities (including the number of fish lifted, relative to the target design populations for upstream fish passage as described in Article 412 of the 1999 License Order) and plans for the next year's activities. HG&E shall consult with MADEP on the next year's planned activities. The scope of work for the fishway monitoring shall be conducted consistent with Condition 15 of the 2001 WQC. HG&E shall monitor upstream fish passage for federally and state

endangered shortnose sturgeon including, but not limited to, counting, trapping, monitoring, and collection of biological data. Except for Fall 2004, HG&E will not interrupt Fish Lift operations during Upstream Passage Seasons; and a functioning trap for salmon and the ability to trap and truck shad will be available during Upstream Passage Seasons before and after construction in 2004.

Section 4.6(f). Further Consultation: Following completion of construction under Section 4.6(b) and subsequent evaluations and modifications described above, HG&E shall consult with the Parties whenever necessary and as requested by the Resource Agencies to assess the effectiveness of the upstream passage facilities to pass federally and state endangered shortnose sturgeon and other diadromous and resident fish, including an evaluation of the ability to achieve the target design populations for upstream fish passage as described in Article 412 of the 1999 License Order and Conditions 14(c) and 14(d) of the 2001 WQC.

Section 4.7. Downstream Fish Passage.

Section 4.7(a). Objective: The objective of Section 4.7 is to have HG&E install, operate and maintain downstream fish passage facilities for diadromous and resident fish at the Project that safely and successfully pass the fish without injury or significant impairment to essential behavioral patterns. HG&E shall consult with the Parties pursuant to Section 3.3 above with respect to the analysis, design, construction, operation, and effectiveness evaluation of downstream fish passage facilities as described in this Section. This provision is based on Article 411 of the 1999 License Order and Condition 14 of the 2001 WQC. The current primary downstream fish passage facilities are the louver bypass facility (including the Louver Bypass Discharge Pipe), Downstream Sampling Station, and the existing Bascule Gate.

Section 4.7(b). Operation under Existing Downstream Fish Passage Plan: Until the FERC approves the enhancements to the downstream fish passage plan as described in Section 4.7(c) below, HG&E shall operate and maintain the downstream fish passage facilities at the Project pursuant to the Downstream Fish Passage Plan approved by FERC on June 19, 2003 (103 FERC ¶ 62,165).

Section 4.7(c). Enhancements to Downstream Fish Passage Plan: In order to enhance downstream fish passage at the Project, HG&E shall implement interim measures to improve downstream passage and concurrently address a permanent solution for downstream passage and exclusion of diadromous fish (including shortnose sturgeon) and resident fish, with the goal that when such fish appear on the upstream side of the Project Dam they will be immediately passed downstream without injury or significant impairment to essential behavioral patterns. HG&E's activities shall be in several phases as follows:

Section 4.7(c)(1). Phase 1 – 2004-2005 (Interim Downstream Passage Measures and Research)

During the period 2004 through 2005, in consultation with the Parties pursuant to Section 3.3 above, HG&E shall (i) implement modifications to the Downstream Sampling Facility and potentially to the Louver Bypass Discharge Pipe (as set forth in Section 4.7(c)(1)(A) below), (ii) implement operational changes to prioritize canal flow during Fall, evening hours; and (iii) conduct research and studies (as set forth in Section 4.7(c)(1)(B) below). Based on such research, on or before December 31, 2005, HG&E and the Parties, in consultation pursuant to Section 3.3 above, shall determine whether to implement Phase 2A or Phase 2B below as provided in Section 4.7(c)(2) below. In further preparation for that 2005 Decision Point, HG&E shall meet with the Parties on or before December 31, 2004, to review the data then available and the research to be completed in 2005 prior to the 2005 Decision Point.

As more fully discussed in Appendix F attached to the Settlement, HG&E shall consult with the Parties, and/or obtain the concurrence and/or approval of each plan or work, pursuant to Section 3.3. Thereafter, HG&E shall file such plans with the FERC and the MADEP, and shall implement such plans as approved in writing by the FERC and MADEP. Following completion of studies, HG&E shall distribute the results to the Parties.

Section 4.7(c)(1)(A) – HG&E shall implement modifications to facilities to enhance downstream passage for diadromous fish as described below:

- *To minimize the potential for injury to shortnose sturgeon if they enter the Downstream Sampling Facility, in consultation with the Parties pursuant to Section 3.3 above, HG&E shall develop a plan to modify the Downstream Sampling Facility with such modifications to be completed by April 15, 2004, and to test the effectiveness of such modifications thereafter in 2004. The plan was filed with the FERC and the MADEP on March 1, 2004. HG&E shall implement the plan as approved in writing by the FERC and the MADEP. If, after such modifications, evidence of injury to shortnose sturgeon is found, HG&E shall consult with the Parties pursuant to Section 3.3 above to determine if any additional modifications are appropriate. HG&E shall operate the Downstream Sampling Facility in accordance with the Downstream Sampling Facility Operating Protocol, attached as Appendix G hereto.*
- HG&E shall evaluate the effect of the height of the drop from the Louver Bypass Discharge Pipe to the tailrace on shortnose sturgeon through a radio tracking study. If, in consultation with the other Parties, HG&E determines it is necessary to reduce the height of the drop from the Louver Bypass Discharge Pipe to the tailrace to enhance the survival of shortnose sturgeon, HG&E shall propose how best to modify the Louver Bypass Discharge Pipe in a plan (to be filed after consultation with the Parties pursuant to Section 3.3 above) that provides for such

modifications to be implemented in 2005, to be operational for the Spring 2006 Upstream Passage Season, and effectiveness testing of the modifications in 2006 after the modifications are implemented. HG&E shall file the plan with the FERC and the MADEP on or before April 1, 2005, and shall implement the plan as approved in writing by the FERC and the MADEP.

- To reduce entrainment, in consultation with the Parties (pursuant to Section 3.3 above), HG&E shall develop a plan to change flow prioritization from the Hadley Falls units to the Canal during nighttime periods from October 1 through the later of: (i) the time when the River temperature reaches 5° C., or (ii) November 30 (unless the Parties, in consultation pursuant to Section 3.3 above, agree to an earlier time), with prioritizing the Canal first and then regulating the Hadley Falls Station. HG&E shall file the plan with the FERC and the MADEP on or before December 31, 2004, and shall implement the plan as approved in writing by the FERC and the MADEP. HG&E shall also consult with the Parties pursuant to Section 3.3 above to determine if additional or alternative operational changes will enhance downstream passage.

Section 4.7(c)(1)(B) –Phase 1 of the research program (in 2004-2005) is intended to develop additional information on the downstream migration of American eels, shortnose sturgeon, and other migrating fish in preparation for a decision on whether to implement Phase 2A or Phase 2B as described below:

- Louver Field Study – 2004: (i) to evaluate effectiveness of the full depth louvers to guide shortnose sturgeon and American eels; and (ii) to evaluate the behavior of shortnose sturgeon and American eels at the ramp and the entrance to the bypass pipe.
- CFD Modeling – 2004: (i) of the Hadley Falls intakes, to evaluate the potential of modifying the existing Hadley Falls intake racks to be an effective interim (and potentially long-term) device to prevent entrainment and impingement of fish at the Hadley Falls; and (ii) of a potential bottom weir, to evaluate if such a weir would produce flow patterns conducive to guide bottom migrants into the Canal.
- USGS Flume Study – 2004: (i) to determine the swimming depth and behavior of yearling, juvenile and adult shortnose sturgeon at a bar rack structure; (ii) to determine the threshold velocity for avoidance of impingement/entrainment of yearling, juvenile, and adult shortnose sturgeon at conditions present at the proposed modified Hadley Falls intake racks with 2-inch spacing; and (iii) to determine if yearling, juvenile, and adult shortnose sturgeon can avoid impingement/entrainment at conditions present at a potential alternative bar rack facility (2-inch spacing and velocities of 2 fps).

- Eel Study – 2004: to determine the timing of migration of silver-phase American eels at the Project.
- USGS Flume Study – 2005: (i) To determine how shortnose sturgeon would respond to a bottom weir for guidance; and (ii) to determine how shortnose sturgeon would respond to a bypass entrance, integral with a rack structure.
- Bascule Gate and Rubber Dam Section No. 5 Analysis (a desk-top study) – 2005: (i) to identify potential solutions to the interference of the Bascule Gate discharge on the entrance to the spillway fishway; (ii) to evaluate the feasibility of using/modifying the Bascule Gate and/or modifying the spillway in the vicinity of Rubber Dam Section No. 5 (adjacent to the Bascule Gate) to pass shortnose sturgeon, American eels and other migratory fish; and (iii) to investigate modifications to the Bascule Gate and/or the spillway in the vicinity of Rubber Dam Section No. 5 to safely and successfully pass fish without injury or significant impairment to essential behavioral patterns down the spillway and over the apron into the Bypass Reach.
- Spawning Study – 2005: to identify potential spawning sites for shortnose sturgeon downstream of the Dam.

Section 4.7(c)(2). Decision Point – 2005: *Based on the results of the Phase 1 research, on or before September 30, 2005, HG&E shall distribute to the Parties a recommendation on whether to implement Phase 2A or Phase 2B, as described below. It is the intent of the Parties that HG&E shall implement Phase 2A as set forth in Appendix F of the Settlement Agreement if: (i) the results of the Phase 1 studies (described above) demonstrate that HG&E can modify the existing Hadley Falls intake racks to be an effective interim (and potentially long-term) device to achieve the threshold velocity for avoidance of entrainment and impingement of fish; and (ii) the Parties have identified a potential solution to the Bascule Gate discharge interference on the spillway fishway and a means of safely and successfully passing fish down the spillway and over the apron. If the two elements (i) and (ii) above are not confirmed by the Resource Agencies pursuant to the process described below, then HG&E shall implement Phase 2B.*

The process for determining whether HG&E shall implement Phase 2A or Phase 2B shall be as follows: After circulation by HG&E of the study results and its recommendation for Phase 2A or Phase 2B, HG&E shall consult with the Parties pursuant to Section 3.3 above. On or before December 31, 2005, the Resource Agencies (FWS, NOAA Fisheries, MADEP and MADFW) shall notify HG&E if they all agree with HG&E's recommendation; in which case, HG&E shall implement that recommendation. If the Resource Agencies do not all agree with HG&E's recommendation, they will so notify HG&E by December 31, 2005, and HG&E shall then implement Phase 2B.

Section 4.7(c)(3). Phase 2A (2006-2010): Based on the Phase 1 research (see Section 4.7(c)(1) above), consistent with the decision made pursuant to Section 4.7(c)(2) above, and in consultation with the Parties pursuant to Section 3.3 above, HG&E shall implement the work and research as outlined below for further enhancements of the downstream fish passage facilities.

Under Phase 2A the Parties intend to achieve the objectives for safe and successful downstream fish passage (as stated in Appendix F attached hereto, page 1) in the following way: (i) HG&E shall install and construct an interim (and potentially long-term) device by the end of 2006 that prevents entrainment and impingement at the Project based on modifications of the Hadley Falls intake racks and installation of a new trash rake structure connected with the intake racks; (ii) HG&E shall prepare a functional design drawing of the selected option to modify the Bascule Gate for safely and successfully passing fish without injury or significant impairment to essential behavioral patterns and to solve interference of Bascule Gate discharge on the spillway fishway, then build a prototype and field test (if necessary) in 2006, with engineering/permitting in 2007 and construction in 2008; (iii) HG&E shall undertake additional research during the period 2006 to 2010 to ensure that the downstream passage facilities are effective for exclusion and safe and successful passage of fish over the Dam; (iv) HG&E shall design, engineer, and permit in 2008: (A) an alternative exclusion device and (B) an alternative passage device in the vicinity of Rubber Dam Section No. 5 (if the modifications to the Hadley Falls intake racks are determined not to be successful as a long-term exclusion device), for safely and successfully passing fish without injury or significant impairment to essential behavioral patterns, with construction completed in 2009, and start of effectiveness testing in 2010; and (v) HG&E shall implement a long-term monitoring program for shortnose sturgeon from 2011 to the end of the Project License. The specific schedule is as follows:

2006

- HG&E shall design, engineer, permit, build and complete the modifications to the existing Hadley Falls intake racks and installation of a new trash rake structure, as agreed to at the Decision Point 2005 above, as an exclusion device for downstream migrating fish including shortnose sturgeon to prevent entrainment and impingement at the Hadley Falls intakes. The modifications to the Hadley Falls intake racks and the installation of the new trash rake will be completed by the end of 2006 (or earlier if possible depending on River conditions and obtaining necessary permits).
- HG&E shall continue to implement operational changes commenced in 2005 as agreed to by the Parties (through consultation pursuant to Section 3.3 above) to enhance downstream passage (as described above in Phase 1).

- HG&E shall prepare a functional design drawing of the selected option to modify the Bascule Gate for safe passage and to solve interference of Bascule Gate discharge on spillway fishway; and shall build prototype and field test (if necessary).
- HG&E shall conduct effectiveness studies of the modifications to the Louver Bypass Discharge Pipe if implemented in 2005, as provided for in the plan approved by the FERC and the MADEP (discussed in Phase 1 above); and shall distribute results to the Parties.
- HG&E shall perform radio tracking studies of shortnose sturgeon and silver-phase American eels (as discussed more fully in Appendix F to the Settlement Agreement); and shall distribute results to the Parties.

2007

- HG&E shall engineer, design and permit modifications to the Bascule Gate to provide safe and successful passage for the fish without injury or significant impairment to essential behavioral patterns and to solve the interference of Bascule Gate discharge on the spillway fishway.
- HG&E shall continue to perform radio tracking studies of shortnose sturgeon (as described more fully in Appendix F to the Settlement Agreement) and use the results of the studies to evaluate the effectiveness of the modifications to the Hadley Falls intake racks completed in 2006; continue to perform radio tracking studies of silver-phase American eels, if necessary; distribute results to the Parties.

2008

- HG&E shall provide to the Parties (consulted pursuant to Section 3.3 above) the results of the effectiveness testing of the modifications to the Hadley Falls intake racks and other measures in 2006-2007, and HG&E's conclusion whether or not those modifications and other measures achieve the goals for exclusion in Phase 2A as stated above. Based on that information HG&E and the Parties (through the decisional process described in Section 4.7(c)(2) above) shall determine if it is necessary to build an alternative exclusion device.
 - If (through the decisional process described in Section 4.7(c)(2) above) the Resource Agencies determine that it is not necessary for HG&E to build an alternative exclusion device, then HG&E shall design, engineer, permit and construct the modifications to the Bascule Gate for fish passage.
 - If (through the decisional process described in Section 4.7(c)(2) above) the Resource Agencies determine that it is necessary for the licensee to build an

alternative exclusion device, then the licensee shall design, engineer and permit: (i) an alternative exclusion device, and (ii) an alternative passage device (in the vicinity of Rubber Dam Section No. 5), as determined by the agencies and parties (in consultation pursuant to Section 3.3 above) that will not only exclude fish from the Hadley Falls intakes without impingement, but will also provide for safe and successful downstream passage of fish without injury or significant impairment to essential behavioral patterns.

- HG&E shall continue to perform radio tracking studies of shortnose sturgeon (as described more fully in Appendix F to the Settlement Agreement); and shall distribute results to the Parties.
- HG&E shall conduct a Population Survey for shortnose sturgeon in the Connecticut River, from Long Island Sound to Turners Falls (as described more fully in Appendix F to the Settlement Agreement) and distribute results to the Parties. Recapture studies will be conducted and any previously collected information will be used to calculate new estimates that could be compared to historical numbers.

2009

- HG&E shall bid, build and complete construction of the device(s) as determined to be necessary in 2008 (in consultation with the Parties pursuant to Section 3.3 above).
- HG&E shall continue radio tracking studies of shortnose sturgeon (as described more fully in Appendix F to the Settlement Agreement); and shall distribute results to the Parties.

2010

- HG&E shall commence operation of the device(s) constructed in 2009 prior to April 1, 2010.
- HG&E shall consult with the Parties (pursuant to Section 3.3 above) to develop a plan to study the effectiveness of the alternative exclusion and passage device(s) and the modifications to the spillway in the vicinity of Rubber Dam Section No. 5 completed in 2008-2009; shall implement the plan; and shall distribute results to the Parties by January 31, 2011.
- HG&E shall consult with the Parties (pursuant to Section 3.3 above) to develop long-term monitoring protocol for shortnose sturgeon during the term of the License for the Project, with distribution of the results annually to the Parties. If after 2010 HG&E determines, in consultation with the Parties (pursuant to Section

3.3 above), that shortnose sturgeon are not passing safely downstream of the Project, HG&E shall consult with the Parties (pursuant to Section 3.3 above) to determine a plan for re-evaluating the downstream passage facilities.

Plans to implement each part of Phase 2A above shall be prepared and submitted to the Parties pursuant to Section 3.3 above. HG&E shall consult with the Parties, and/or obtain the concurrence and/or approval of that plan, pursuant to Section 3.3 above. Thereafter, HG&E shall file such plans with the FERC and the MADEP, and shall implement such plans as approved in writing by the FERC and MADEP.

Section 4.7(c)(4). Phase 2B (2006-2009): Based on the Phase 1 research (see Section 4.7(c)(1) above), consistent with the decision made pursuant to Section 4.7(c)(2) above, and in consultation with the Parties pursuant to Section 3.3 above, HG&E shall implement the plan as outlined below for further enhancements of the downstream fish passage facilities.

Under Phase 2B the Parties intend to achieve the objectives for safe and successful downstream fish passage (as stated in Appendix F attached hereto, page 1) in the following way: (i) HG&E shall continue to implement operational changes commenced in 2005 to enhance downstream passage of shortnose sturgeon; (ii) HG&E shall continue studies and research to determine the appropriate alternative exclusion and passage device(s), including an angled bar rack; (iii) HG&E shall design/permit measures and modifications in 2007 for: (A) an alternative exclusion device and (B) an alternative passage device (in the vicinity of Rubber Dam Section No. 5) for safely and successfully passing the fish without injury or significant impairment to essential behavioral patterns and avoiding any potential flow interference problems with the spillway fishway, construct these facilities in 2008, and start of effectiveness testing of these facilities in 2009; (iv) HG&E shall undertake additional research and additional measures from 2006 to 2009 to ensure that the downstream passage facilities are effective for exclusion and guidance as described below; and (v) HG&E shall implement a long-term monitoring program for shortnose sturgeon from 2010 to the end of the Project License. The specific schedule is as follows:

2006

- HG&E shall perform a full feasibility study of the options for an alternative passage device (in the vicinity of Rubber Dam Section No. 5) to: (i) safely and successfully pass the fish without injury or significant impairment to essential behavioral patterns down the spillway over the apron and into the Bypass Reach, and (ii) avoid any potential flow interference problems with the spillway fishway. HG&E shall build a prototype and field test (if necessary).

- HG&E shall continue to implement operational changes commenced in 2005 as agreed to by the Parties (in consultation pursuant to Section 3.3 above) to enhance downstream passage (as described above in Phase 1).
- HG&E shall consult with the Parties (pursuant to Section 3.3 above) to develop a research and study program to evaluate alternative exclusion and passage device(s).
- HG&E shall perform radio tracking studies of shortnose sturgeon and silver-phase American eel (as described more fully in Appendix F to the Settlement Agreement); and shall distribute results to the Parties.
- HG&E shall conduct effectiveness studies of the modifications to the Louver Bypass Discharge Pipe if performed in 2005, as provided for in the plan approved by the FERC and the MADEP (discussed in Phase 1 above); and shall distribute the results to the Parties.

2007

- In consultation with the Parties pursuant to Section 3.3 above, HG&E shall design/engineer/permit: (i) an alternative exclusion device and (ii) an alternative passage device (in the vicinity of Rubber Dam Section No. 5), determined in 2006 by HG&E and the Parties to safely and successfully pass the fish without injury or significant impairment to essential behavioral patterns down the spillway over the apron and into the Bypass Reach, avoiding any potential flow interference problems with the spillway fishway, that will not only exclude fish from the Hadley Falls intakes without impingement, but will also provide for safe and successful downstream passage of diadromous and resident fish.
- HG&E shall continue to implement operational changes commenced in 2005 as agreed to by the Parties (in consultation pursuant to Section 3.3 above) to enhance downstream passage (as described above in Phase 1).
- HG&E shall continue radio tracking studies of shortnose sturgeon (as described more fully in Appendix F to the Settlement Agreement); and shall distribute results to the Parties.

2008

- As designed and permitted in 2007, in consultation with the Parties pursuant to Section 3.3 above, HG&E shall bid, build and complete construction of: (i) the alternative exclusion device, and (ii) the alternative passage device.

- HG&E shall continue to implement operational changes commenced in 2005 as agreed to by the Parties (in consultation pursuant to Section 3.3 above) to enhance downstream passage (as described above in Phase 1).
- HG&E shall continue radio tracking studies of shortnose sturgeon (as described more fully in Appendix F to the Settlement Agreement); and shall distribute results to the Parties.
- HG&E shall conduct a Population Survey for shortnose sturgeon in the Connecticut River, from Long Island Sound to Turners Falls (as described more fully in Appendix F to the Settlement Agreement) and distribute results to the Parties. Recapture studies will be conducted and any previously collected information will be used to calculate new estimates that could be compared to historical numbers.

2009

- HG&E shall commence operation of the exclusion and passage device(s) constructed in 2008 prior to April 1, 2009.
- HG&E shall consult with the Parties (pursuant to Section 3.3 above) to develop a plan to study the effectiveness of the alternative exclusion and passage device(s) completed in 2008; shall implement the plan; and shall distribute the study results to the Parties by January 31, 2010.
- HG&E shall consult with the Parties (pursuant to Section 3.3 above) to develop long-term monitoring protocol for shortnose sturgeon during the term of the License for the Project, with distribution of the results annually to the Parties. If after 2009 HG&E determines, in consultation with the Parties (pursuant to Section 3.3 above), that shortnose sturgeon are not passing safely downstream of the Project, HG&E shall consult with the Parties (pursuant to Section 3.3 above) to determine a plan for re-evaluating the downstream passage facilities.

Plans to implement each part of Phase 2B above shall be prepared and submitted to the Parties pursuant to Section 3.3 above. HG&E shall consult with the Parties, and/or obtain the concurrence and/or approval of that plan, pursuant to Section 3.3 above. Thereafter, HG&E shall file such plans with the FERC and the MADEP, and shall implement such plans as approved in writing by the FERC and MADEP.

Section 4.8. Upstream and Downstream Eel Passage.

Section 4.8(a). Objective: The objective of Section 4.8 is to have HG&E install, operate and maintain upstream and downstream eel passage facilities at the Project to

facilitate safe and successful passage for American eels. This provision is based on Article 413 of the 1999 License Order and Condition 14(j) of the 2001 WQC (and the MADEP extension of time letter dated January 21, 2004). HG&E shall consult with the Parties pursuant to Section 3.3 above with respect to the analysis, design, construction, operation, and effectiveness evaluation of any new eel passage facilities or modifications to existing facilities as described in this Section 4.8.

Section 4.8(b)(1). Interim upstream eel passage: In consultation with the Parties pursuant to Section 3.3 above, HG&E has developed and filed an interim plan on December 31, 2003, that includes the following activities by year:

- (i) By July 1, 2004, HG&E shall: (1) construct and implement modified eel collectors on the Holyoke side of the Project; (2) construct and install a ramp and an eel collector on the South Hadley side of the Project; (3) move eels upstream and collect data on how upstream migrants approach the Dam; and (4) conduct a marking study to determine if backdrop is an issue.
- (ii) In 2005, HG&E shall: (1) continue to move eels upstream and collect as much data as possible on how upstream migrants approach the Dam; and (2) study where to locate entrance passage on the Holyoke side of the Project.

The plan was approved in writing by MADEP on January 21, 2004. HG&E shall implement the plan as approved in writing by MADEP and FERC.

Section 4.8(b)(2). Permanent upstream eel passage: In consultation with the Parties pursuant to Section 3.3 above, on or before January 31, 2006, HG&E shall develop a permanent plan that includes the following activities by year:

- (i) In 2006, HG&E shall implement permanent measures and shall construct permanent facilities for upstream eel passage on both the Holyoke and South Hadley sides of the Project and shall conduct studies to evaluate the effectiveness of the measures and facilities.
- (ii) In 2007, HG&E shall complete additional effectiveness studies if determined necessary based on effectiveness studies conducted in 2006.

HG&E shall file the upstream eel passage plan with the FERC and the MADEP on or before March 31, 2006. HG&E shall implement the plan as approved in writing by MADEP and FERC.

Section 4.8(b)(3). Upstream eel passage – Annual Report. Commencing on March 1, 2005, HG&E shall distribute annual reports to the Parties and to the Connecticut River Atlantic Salmon Commission describing the actions taken in the prior year and the results

of data collection at the eel facilities on the South Hadley and Holyoke sides of the Project. HG&E shall file the annual reports with the FERC and the MADEP on or before March 1 of each year.

Section 4.8(c). Downstream eel passage: Downstream passage for eels at the Project will be implemented and enhanced as part of the downstream fish passage facilities pursuant to Section 4.7 above.

Section 4.9. Annual Plans for Fishway Construction. Except as otherwise provided for under Sections 4.6 through 4.8 above, in consultation with the Parties pursuant to Section 3.3 above HG&E shall prepare an annual construction plan, containing detailed plans and schedules for the fishway construction to be undertaken during the next year. A proposed construction plan shall be provided to the Parties on or before January 31 of each year before the construction season commences for that year, and shall be filed at the FERC and MADEP on or before February 28 of that year. The construction plan shall be designed to avoid interruption of the operations of the Fish Lifts. HG&E shall implement the construction plans as approved in writing by MADEP and FERC.

Section 4.10. Consultation with the Town of South Hadley. As set forth in Section 4.11(h) below, HG&E has included the Town of South Hadley in the entities consulted on matters relating to the Riparian Management Plan (filed as part of the CRLMP). In addition, prior to the submittal by HG&E to the FERC of any proposed modification or amendment to the Shoreline Erosion Remediation Plan, the Water Quality Monitoring Plan, or the CRLMP, HG&E shall consult with the Town of South Hadley.

Section 4.11. Compliance Plans pursuant to the 1999 License Order and the 2001 WQC. The following plans required by the 1999 License Order and the 2001 WQC (as described below) have been filed and approved as set forth below. The terms and conditions of these plans are incorporated herein by reference and made part of the Proposed Settlement License Articles as set forth in Appendix A hereto. HG&E shall implement all plans or modifications thereto as approved in writing by the FERC and the MADEP.

Section 4.11(a). Shoreline Erosion Remediation Plan – Consistent with Article 403 of the 1999 License Order, HG&E shall implement the Shoreline Erosion Remediation Plan approved by FERC (as modified) on August 1, 2001 (96 FERC ¶ 62,100).

Section 4.11(b). Water Quality Monitoring Plan – Consistent with Article 404 of the 1999 License Order and Condition 22 of the 2001 WQC, HG&E shall implement the Water Quality Monitoring Plan approved by FERC on August 10, 2001 (96 FERC ¶ 62,144) and by MADEP on October 10, 2003.

Section 4.11(c). Threatened and Endangered Species Protection Plan – Consistent with Article 416 of the 1999 License Order and Condition 21(b) of the 2001 WQC, HG&E shall implement the Threatened and Endangered Species Protection Plan approved by FERC on June 6, 2003 (103 FERC ¶ 62,131) and filed with the MADEP on January 30, 2003.

Section 4.11(d). Invasive Species Monitoring Plan – Consistent with Article 417 of the 1999 License Order and Condition 21(a) of the 2001 WQC, HG&E shall implement the Invasive Species Monitoring Plan as approved by FERC on August 21, 2001 (96 FERC ¶ 62,174) and by MADEP on October 10, 2003.

Section 4.11(e). Fish and Aquatic Habitat Monitoring Plan – Consistent with Article 410 of the 1999 License Order, HG&E shall implement the Fish and Aquatic Habitat Monitoring Plan as approved by FERC on June 24, 2003 (103 FERC ¶ 62,175) and filed with the MADEP on October 31, 2002. HG&E shall modify, if necessary, the Fish and Aquatic Habitat Monitoring Plan based on the Spring and Fall 2003 and 2004 Canal System Outages and to track the 12-year plan in the Fish and Aquatic Habitat Monitoring Plan.

Section 4.11(f). Comprehensive Recreation and Land Management Plan – Consistent with Article 418 of the 1999 License Order, HG&E shall implement the CRLMP as approved by FERC; the CRLMP was filed with FERC on May 1, 2003, and is pending. In consultation with the Town of South Hadley, HG&E included in the Recreation Plan (as part of the CRLMP) a proposal to develop the Riverside Park including a clarification of the location of the Riverside Trail below the dam in the Town of South Hadley (see Figure No. 1 above).

Section 4.11(g). Cultural Resources Management Plan – Consistent with Article 420 of the 1999 License Order, HG&E shall implement the Cultural Resources Management Plan as approved by the FERC on June 27, 2001 (95 FERC ¶ 62,274).

Section 4.11(h). Riparian Management Plan – Consistent with the 1999 License Order and Condition 19 of the 2001 WQC and in consultation with all Parties, including the Town of South Hadley, HG&E shall implement the Riparian Management Plan as approved by FERC and the MADEP; this Plan was included as part of the CRLMP as filed with the MADEP on April 30, 2003, and filed with FERC on May 1, 2003, and is pending.

Section 4.11(i). Comprehensive Canal Operations Plan – Consistent with Article 409 of the 1999 License Order and Condition 13 of the 2001 WQC, HG&E shall implement the CCOP as approved by FERC on June 5, 2003 (103 FERC ¶ 62,130) and filed at MADEP, with the amendments to the CCOP contained in the Comprehensive Operations and Flow Plan, as approved by the FERC on June 24, 2003 (103 FERC ¶ 62,178); and as

amended or modified pursuant to this Settlement Agreement.

Section 4.11(j). Comprehensive Operations and Flow Plan -- Consistent with Article 407 of the 1999 License Order and Condition 13 of the 2001 WQC, HG&E shall implement the COFP as approved by FERC on June 24, 2003 (103 FERC ¶ 62,178), and filed with the MADEP on January 20, 2003; and as amended or modified pursuant to this Settlement Agreement.

Section 4.11(k). Downstream Fish Passage Plan -- Consistent with Article 411 of the 1999 License Order and Condition 14 of the 2001 WQC, HG&E shall implement the Downstream Fish Passage Plan, as approved by FERC on June 19, 2003 (103 FERC ¶ 62,165); and as amended or modified pursuant to this Settlement Agreement.

Section 4.11(l). Upstream Fish Passage Plan -- Consistent with Article 412 of the 1999 License Order and Condition 14 of the 2001 WQC, HG&E shall implement the Upstream Fish Passage Plan, as modified and approved by FERC on June 24, 2003 (103 FERC ¶ 62,177) and filed with the MADEP November 11, 2002; and as amended or modified pursuant to this Settlement Agreement.

**APPENDIX D – Downstream Sampling Facility Operating Protocol, Filed as
Appendix G to the Settlement Agreement**

HOLYOKE CANAL SYSTEM

**LOUVER BYPASS PIPE AND FISH SAMPLING FACILITY
OPERATING PROCEDURES**

This procedure needs to be used when opening and closing the louver bypass pipe and operating the louver bypass fish sampling facility. **The fish sampling facility must be staffed whenever it is operating in sampling mode.**

TO FILL THE PIPE WITH WATER

The following instructions assume that the bypass pipe is empty and: 1) the upstream slide gate is closed; 2) the downstream slide gate is open and the pipe is empty; 3) both two-inch ball valve air vents are open; and 4) the sluice gates at the fish sampling facility are closed.

- Step 1. Close the downstream slide gate.
- Step 2. Open the upstream gate two inches. At this opening the pipe should fill in about ten minutes.
- Step 3. As the pipe fills, air should be coming out of both air vents. When water starts to come out of the downstream air vent at the access manhole, close the valve completely. When air stops coming out of the upstream air vent at the canal wall, the pipeline is full—close that air vent.
- Step 4. Open the upstream gate completely.

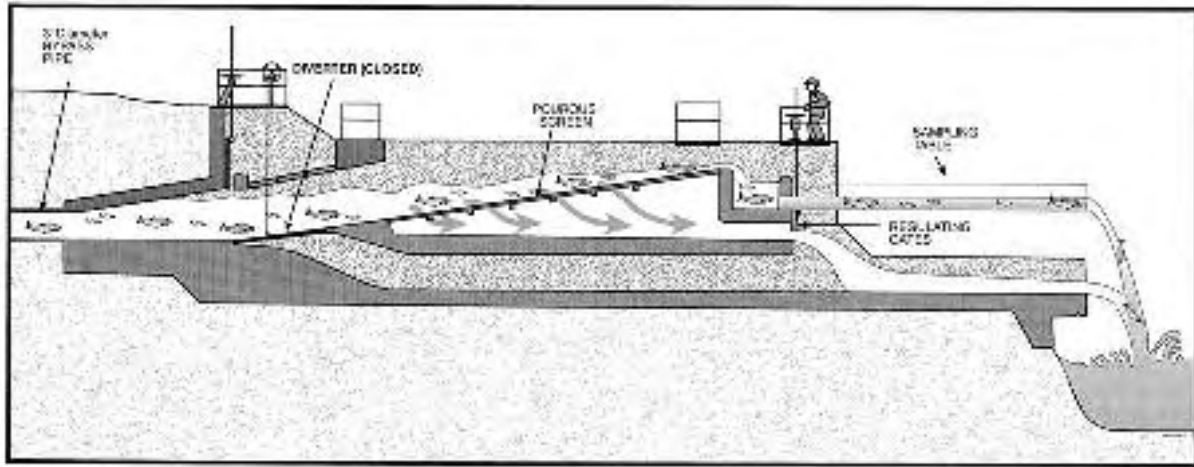
TO PLACE THE FACILITY IN SAMPLING MODE

Figure 1. Schematic of the louver bypass system in sampling mode.

The following instructions assume that the pipe is full of water:

- Step 1. Lower diversion vane.
- Step 2. Open both sluice gates on fish sampling facility.
- Step 3. Check to see that there is no one in the fish sampling facility (all three levels) and open the downstream slide gate slowly at a rate of no more than two feet per minute.
- Step 4. Allow 3-4 minutes for the flow to reach steady state.
- Step 5. Adjust the sluice gates to achieve the desired amount of flow over the weir into the sampling trough. Gates should be moved in 0.1 foot increments. Wait 1-2 minutes between gate adjustments for flow to return to steady state.

TO PLACE THE FACILITY IN NON-SAMPLING (BYPASS) MODE

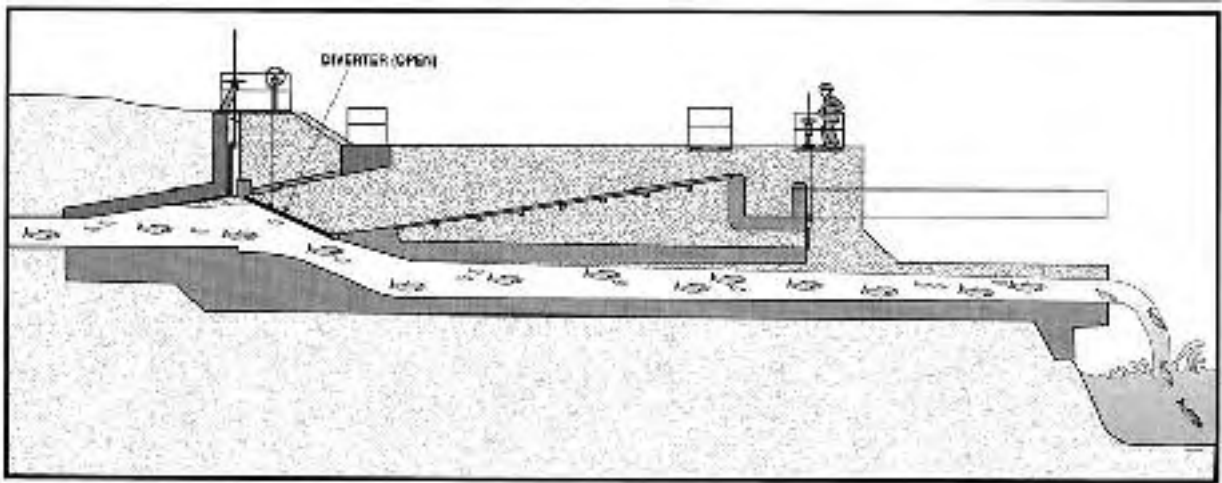


Figure 2. Schematic of the louver bypass system in non-sampling (bypass) mode.

The following instructions assume that the facility is in sampling mode:

- Step 1. Raise the diversion vane completely.
- Step 2. Check to see that there is no one in the fish sampling facility (all three levels) and open the downstream gate slowly, no more than two feet per minute.

TO SHUTDOWN AND DEWATER THE BYPASS PIPE

The following instructions assume that the sampling facility is in non-sampling (bypass) mode.

- Step 1. Close the downstream slide gate slowly at a rate of no more than two feet per minute.
- Step 2. Close the upstream slide gate completely.
- Step 3. Raise the manhole cover over the upstream air vent at the canal wall and open the valve completely.
- Step 4. Raise the diversion vane about a foot to allow flow and fish to pass under it.

- Step 5. Open the downstream slide gate 0.1 feet to drain the pipeline. Do not allow anything to block the flow of air to the vent. Do not open the gate more than 0.1 feet at this time.
- Step 6. After five minutes, open the downstream air vent. Water may come out of the vent at this time.
- Step 7. When water stops coming out of the downstream air vent, open the downstream slide gate to 1.0 feet.

NOTE: Except during emergency conditions, such as a pipe break, the upstream slide gate should not be used to shutdown flow in the pipeline. This could lead to excessive negative pressures in the pipeline which would cause the pipeline to collapse. If you must close the upstream slide gate, also open the upstream air vent.

**APPENDIX E – Detailed Description of HG&E Proposed Settlement
Downstream Research and Construction (2004-2009/10), Filed as
Appendix F to the Settlement Agreement**

This Appendix to the Settlement Agreement⁴¹ provides background on research that has been previously conducted and the proposed downstream research and construction activities relating to downstream fish passage facilities for diadromous and resident fish that will be undertaken as part of the Settlement. The downstream fish passage facilities are to be designed, constructed and operated to: (i) prevent entrainment or impingement in the Project intake system, (ii) prevent injury to fish if passed over or through the dam (including through the Bascule Gate or through Rubber Dam Section No. 5, adjacent to the Bascule Gate) and onto the spillway, and (iii) ensure that all downstream migrating diadromous and resident fish that appear on the upstream side of the Dam shall be passed downstream without injury or significant impairment to essential behavioral patterns. Under the phased research and construction program Holyoke Gas & Electric Department (HG&E) shall implement interim measures to improve downstream passage and concurrently address a permanent solution for downstream passage for diadromous and resident fish to safely and successfully pass the fish without injury or significant impairment to essential behavioral patterns. The proposed research and construction activities set forth in this Appendix will be performed during the period from 2004-2010 (under Phases 1 and 2A, as described below) or from 2004-2009 (under Phases 1 and 2B, also described below) with respect to downstream fish passage.

All plans (for studies and construction) will be prepared in consultation with the Parties pursuant to Section 3.3 of the Settlement Agreement. The Parties to the Settlement Agreement are HG&E, U.S. Fish and Wildlife Service (FWS), NOAA National Marine Fisheries Service (NOAA Fisheries), Massachusetts Department of Environmental Protection (MADEP), Massachusetts Department of Fish and Wildlife (MADFW), Trout Unlimited (TU), the Connecticut River Watershed Council (CRWC).

The Background Section of this Appendix F below provides a summary of previous research on the federally and state endangered shortnose sturgeon. The remainder of this Appendix provides details of a multi-phased research and construction program leading to a permanent solution for downstream fish passage at the Project. Phase 1 consists of research and studies on shortnose sturgeon and American eels that

⁴¹ Note that all definitions contained in the Settlement Agreement are applicable in this Appendix.

will be performed in 2004-2005. Based on the results of Phase 1 research and studies, a decision will be made at the end of 2005 to proceed down the path of either Phase 2A or Phase 2B. Under both Phase 2A and Phase 2B the goal is downstream fish passage facilities for diadromous and resident fish at the Project that safely and successfully pass the fish without injury or significant impairment to essential behavioral patterns. The schedules for construction, operational changes, and additional studies and research are slightly different for Phase 2A and Phase 2B. Additional details on the construction and research to be conducted are provided below. HG&E shall secure all necessary permits and/or authorizations to conduct the studies and work described herein.

A diagram of the Project is included as Figure No. 1 to the Settlement Agreement (submitted as CEII⁴² concurrently with the Settlement).

I. Background

During the relicensing of the Holyoke Project (from approximately 1994 to FERC license issuance in 1999), the parties involved in the relicensing process recognized that limited information was available for guidance of bottom-oriented fish, which include shortnose sturgeon and adult American eels. During the relicensing proceeding the NOAA Fisheries and FWS prescribed an angled bar rack guidance facility for the Hadley Falls intake area under Section 18 of the Federal Power Act (16 U.S.C. §811), as the only alternative identified at that time that could potentially protect shortnose sturgeon and other emigrating fish from entrainment in the Hadley Falls intakes and guide them downstream past the Project. Designs for downstream passage facilities that have been proven effective for bottom-oriented fish such as shortnose sturgeon were not available. In addition, at the time of relicensing, limited Connecticut River-specific information was available on daily and seasonal patterns of shortnose sturgeon migration, and which life stages migrate. Holyoke Water Power (HWP, prior owner of the Project) embarked on a multi-phased research project to improve downstream passage of fish past the Project. Upon acquiring the Project in December 2001, HG&E continued that research program.

During the first phase of relicensing, HWP (and subsequently HG&E) sponsored a multi-year shortnose sturgeon study conducted by Dr. Boyd Kynard (USGS) to determine, in part, when shortnose sturgeon migrate downstream (Kynard *et al.* 1999). Shortnose sturgeon located upstream of the Dam were radio-tagged and antennas were placed at the Dam, the tailrace, and the Canal System to record their passing at the Project. While evidence was collected that demonstrated that shortnose sturgeon do migrate downstream past the Dam, antennas placed at the facility recorded passage of

⁴² CEII refers to Critical Energy Infrastructure Information, pursuant to the Commission's Order No. 630.

only a small number of fish. The limited evidence available suggested that shortnose sturgeon may migrate downstream during high flow events. Even after this study, there was still limited information as to time of year or time of day when migration occurs.

HWP modeled the Hadley Falls intake area using Computational Fluid Dynamics (CFD) to determine if a new angled bar rack had the potential to guide bottom-oriented fish. Under contract from HWP, and later with HG&E, Alden Laboratories developed the CFD model using information from a physical model of the Dam that included the Canal gatehouse and the Hadley Falls intake structures. The model indicated that a new angled bar rack (with a 10-foot surface overlay) would change the surface water flow characteristics and had the potential to guide surface-oriented fish to the bypass gate, but would not produce changes in the lower portions of the water column sufficient to guide bottom-oriented fish.

Under the terms of the Settlement, HG&E shall conduct additional studies and implement measures to achieve a permanent solution for downstream fish passage at the Project. Details of this research and construction program are described in Sections II through VI below.

II. Phase 1 – 2004-2005: Interim Downstream Passage Measures and Research

In 2004 and 2005, HG&E shall implement modifications to facilities and additional research as described below. As also explained further in Part III below, some of the Phase 1 research is in preparation for a decision to be made by December 31, 2005, on whether to implement Phase 2A or Phase 2B. In further preparation for that 2005 Decision Point, HG&E shall meet with the Parties on or before December 31, 2004, to review the data then available and discuss the research to be completed in 2005 prior to the 2005 Decision Point. Plans to implement each element of Phase 1 below shall be prepared and submitted to the Parties pursuant to Section 3.3 of the Settlement Agreement. HG&E shall consult with the Parties, and/or obtain the concurrence and/or approval of that plan, pursuant to Section 3.3. Thereafter, HG&E shall file such plans with the FERC and the MADEP, and shall implement such plans as approved in writing by the FERC and MADEP.

A. Modifications to the Downstream Sampling Facility - 2004

1. In consultation with the Parties pursuant to Section 3.3 of the Settlement Agreement, HG&E shall develop a plan to minimize the potential for injury to shortnose sturgeon if they enter the Downstream Sampling Facility, by increasing the width of the steel trough at the end of the wedge wire screen ramp of the Downstream Sampling Facility by moving the existing steel end wall back approximately 1 foot, and by

installing a rubber lining on the facing of the end wall. The plan shall provide that such modifications will be completed by April 15, 2004 (*i.e.*, prior to the Louver Field Study described below), and shall provide for effectiveness studies of the modifications in 2004, as set forth below. The plan will be filed with the FERC and the MADEP on or before March 1, 2004. HG&E will implement the plan as approved in writing by the FERC and the MADEP.

2. Pursuant to paragraph A.1, above, HG&E shall evaluate the modifications to the Downstream Sampling Facility. The modifications will be evaluated through observations and records of the condition of any shortnose sturgeon found at the Downstream Sampling Facility. For each occurrence, the condition and other physical and biological parameters of the shortnose sturgeon will be recorded on observation sheets as set forth in the Shortnose Sturgeon Handling Plan (attached as Appendix E to the Settlement Agreement). HG&E shall accumulate all records of shortnose sturgeon in the Downstream Sampling Facility and shall submit to the Parties a copy of all completed sheets, along with a summary report, and any proposed further modifications (if necessary). If evidence of injury is found, HG&E shall consult with the Parties pursuant to Section 3.3 of the Settlement Agreement to determine if any additional modifications are appropriate.

3. HG&E shall operate the Downstream Sampling Facility in accordance with the Downstream Sampling Facility Operating Protocol (attached as Appendix G to the Settlement Agreement).

B. Analysis of potential modification to Louver Bypass Discharge Pipe – 2004

1. In consultation with the Parties pursuant to Section 3.3 of the Settlement Agreement, HG&E shall evaluate the effect of the height of the drop from the Louver Bypass Discharge Pipe to the tailrace on shortnose sturgeon. HG&E shall perform a radio tracking study to evaluate the effect of the drop on shortnose sturgeon. Ten wild adult shortnose sturgeon will be tagged and released into the Canal upstream of the louver array at the gatehouse during a period of flow which represents the maximum potential drop (*e.g.*, during Fall 2004 if River conditions allow). These tagged and released fish will be allowed to pass through the entire length of the louver facility and return to the River. An antenna will be installed at the downstream end of the tailrace and a second antenna will be installed 200 feet further downstream to monitor the progress of the released fish. The antenna equipment will track the movement of the released fish through the Project. In addition, after 24-hours and again after one week, HG&E shall survey the River downstream of the Bypass by boat with tracking equipment to confirm that the released fish are alive and displaying normal movements and behavior. If the released fish are alive and behaving normally, it will be assumed that they have

successfully passed through the Louver Bypass Discharge Pipe and no modification to that facility is needed.

2. If the released fish are not able to safely pass through the Louver Bypass Discharge Pipe and HG&E (in consultation with the Parties pursuant to Section 3.3 of the Settlement Agreement) determines it is necessary to reduce the height of the drop from the Louver Bypass Discharge Pipe to the tailrace to enhance the survival of shortnose sturgeon, HG&E shall propose how best to modify the Louver Bypass Discharge Pipe. HG&E shall consult with the Parties (pursuant to Section 3.3 of the Settlement Agreement) and develop a plan for modification of the Louver Bypass Discharge Pipe (as determined to be necessary) to be implemented in 2005 and operational for the Spring 2006 Upstream Passage Season. The plan shall include effectiveness testing of such modifications in 2006 after the modifications are implemented. After consultation with the Parties pursuant to Section 3.3 of the Settlement Agreement, HG&E shall file that plan with the FERC and the MADEP on or before April 1, 2005, and shall implement the plan as approved in writing by the FERC and MADEP.

3. HG&E shall determine if a PIT tag reader can be placed in the Louver Bypass Discharge Pipe to detect any shortnose sturgeon that may enter the bypass facility. Since several hundred of the shortnose sturgeon in the Connecticut River have been PIT tagged both above and below the Dam, HG&E shall determine if a PIT tag reader for the existing PIT tags on shortnose sturgeon above the Project could be placed inside the pipe portion of the Canal louver bypass to detect and track PIT tagged shortnose sturgeon that use the facility. If such a detection system can be installed, HG&E shall install that system by September 30, 2004.

C. Operational Changes - 2005

To reduce entrainment HG&E shall develop a plan, in consultation with the Parties (pursuant to Section 3.3 of the Settlement Agreement), to change flow prioritization from the Hadley Falls units to the Canal during nighttime periods from October 1 through the later of: (i) the time when the River temperature reaches 5° C., or (ii) November 30 (unless the Parties, in consultation pursuant to Section 3.3 of the Settlement Agreement, agree to an earlier time), with prioritizing the Canal first and then regulating the Hadley Falls Station. HG&E shall consider the potential effect of any such changes on the federally threatened and state endangered Puritan tiger beetle in developing these modifications. The operational changes will be implemented commencing in 2005. HG&E shall also consult with the Parties pursuant to Section 3.3 of the Settlement Agreement to determine if additional or alternative operational changes will enhance downstream passage.

HG&E shall file the plan with the FERC and the MADEP on or before December 31, 2004, and shall implement the plan as approved in writing by the FERC and the MADEP.

D. Additional Research and Studies in 2004 - 2005

HG&E shall perform additional research and studies to develop information on the downstream migration of shortnose sturgeon, American eels, and other migratory fish. As discussed in more detail below, the Phase 1 research will include:

- Louver Field Study - 2004: (i) to evaluate effectiveness of the full depth louvers to guide shortnose sturgeon and American eels; and (ii) to evaluate the behavior of shortnose sturgeon and American eels at the ramp and the entrance to the bypass pipe of the louver facility.
- CFD Modeling - 2004: (i) of the Hadley Falls units intakes to evaluate the potential of modifying the existing Hadley Falls units intake racks to be an effective interim (and potentially long-term) device to prevent entrainment and impingement of fish at the Hadley Falls; and (ii) of a potential bottom weir to evaluate if such a weir would produce flow patterns conducive to guide bottom migrants into the Canal.
- USGS Flume Study – 2004: (i) to determine the swimming depth and behavior of yearling, juvenile and adult shortnose sturgeon at a bar rack structure; (ii) to determine the threshold velocity for avoidance of impingement/entrainment of yearling, juvenile, and adult shortnose sturgeon at conditions present at the proposed modified Hadley Falls intake racks with 2-inch spacing; and (iii) to determine if yearling, juvenile, and adult shortnose sturgeon can avoid impingement/entrainment at conditions present at a potential alternative bar rack facility with 2-inch spacing and velocities of about 2 feet per second (fps).
- Eel Study - 2004: to determine the timing of migration of silver-phase American eels at the Project.
- USGS Flume Study – 2005: (i) to determine how shortnose sturgeon would respond to a bottom weir for guidance; and (ii) to determine how shortnose sturgeon would respond to a bypass entrance, integral with a rack structure.
- Bascule Gate and Rubber Dam Section No. 5 Analysis (a desk-top study) - 2005: (i) to identify potential solutions to the interference of the Bascule Gate discharge on the entrance to the spillway fishway; (ii) to evaluate the feasibility of using/modifying the Bascule Gate and/or the spillway in the vicinity of Rubber

Dam Section No. 5 (adjacent to the Bascule Gate) to pass shortnose sturgeon, American eels and other migratory fish; and (iii) to investigate modifications to the Bascule Gate and/or the spillway in the vicinity of Rubber Dam Section No. 5 to safely and successfully pass the fish without injury or significant impairment to essential behavioral patterns down the spillway and over the apron into the Bypass Reach.

- Spawning Study - 2005: to identify potential spawning sites of shortnose sturgeon downstream of the Dam.

1. Louver Field Study - 2004

The Louver Field Study will include: (a) effectiveness testing of the full depth louver facilities as a guidance device, and (b) data collection on the behavior of downstream migrating shortnose sturgeon and American eels as they encounter the facilities.

Objectives:

- 1) To test the effectiveness of full depth louver facilities in the Holyoke Canal to guide downstream movement of shortnose sturgeon and American eels; and
- 2) To evaluate behavior of downstream migrating shortnose sturgeon and American eels at the ramp and entrance to the bypass pipe.

HG&E shall conduct this Louver Field Study as a release-recapture study during the Fall of 2004 by marking approximately 50 cultured juvenile shortnose sturgeon and 10 wild adult shortnose sturgeon (depending on availability and the requirements of any Endangered Species Act (16 U.S.C. §1531, *et seq.*) permit or approval applicable to these studies) and approximately 60 American eels, releasing them in the Canal just below the gatehouse about 300 feet upstream of the louvers, and recapturing them in the Bypass collection facilities located downstream of the louver array. The 60 shortnose sturgeon to be used will be a combination of cultivated and wild fish. Currently the USGS Conte Anadromous Fish Research Center is holding 100 one-year old shortnose sturgeon that have been spawned from Connecticut River stock. Conte Anadromous Fish Research Center staff will test these fish to determine which ones are pre-disposed to moving downstream. HG&E shall radio-tag and release up to 50 of these pre-disposed out-migrating cultured fish, track them along the louver system, and recover them at the fish sampler. The 60 shortnose sturgeon will be recaptured and reused to test different flow regimes in the Canal. The ten wild adult shortnose sturgeon are the same shortnose sturgeon to be used in the Louver Bypass Discharge Pipe analysis (as discussed above in Section II-B) after this test is performed.

Radio telemetry tags will be used to monitor fish movement along the louver array and through the bypass system. Antennas will be placed at several depths (surface, mid-depth and bottom) along the length of the louvers, at the transition to the Bypass pipe, at the Bypass entrance, and in the First Level of the Canal System downstream of the louvers. In addition to release-recapture and telemetry efforts, in consultation with the Parties HG&E shall determine the best technology to observe the behavior of fish as they encounter the louvers, the ramp and the bypass pipe entrance (*e.g.*, hydroacoustics, video).

Sampling will be conducted both day and night. Flows through the Canal during testing will be varied to determine the best passage flow for shortnose sturgeon; such flows to be tested include 1,000 cfs, full run, and incremental flows in between those flows (*e.g.*, 2,000 cfs and 3,000 cfs).

The effectiveness of the louver facility as a guidance device for shortnose sturgeon will be determined based on consultation with the Parties (pursuant to Section 3.3 of the Settlement Agreement), after review of the effective rate for getting shortnose sturgeon into the Bypass pipe and keeping shortnose sturgeon out of the Canal; the effectiveness of the facilities will be evaluated based on the overall objective of downstream fish passage of safely and successfully passing the fish without injury or significant impairment to essential behavioral patterns. The effectiveness of the louver facility as a guidance device for American eels will be determined after review of the study results in consultation with the Parties.

Reporting: HG&E shall summarize the data collected in a draft report including all data, information on the methods, study procedures and a recommendation on the effectiveness of the Louver facility to guide shortnose sturgeon and silver-phase American eels. A draft report will be submitted to the Parties by March 31, 2005. All Parties will have access to any video taken during the data collection. If, based on the goals for downstream fish passage stated above on page 1 of this Appendix F, the Parties (in consultation pursuant to Section 3.3 of the Settlement Agreement) agree that the Louver Facilities are not effective for shortnose sturgeon and/or American eels, HG&E shall consult with the Parties (pursuant to that Section 3.3 consultation process) to develop a plan and schedule for implementing additional measures to achieve the overall objective of downstream fish passage of safely and successfully passing the fish without injury or significant impairment to essential behavioral patterns.

2. Computational Fluid Dynamics (CFD) Modeling - 2004

HG&E shall contract with Alden Research Laboratory to conduct CFD modeling of the Hadley Falls units with a proposed 2-inch rack to evaluate the potential of modifying the existing Hadley Falls intake racks to be an effective interim (and potentially long-term) device to prevent entrainment and impingement of fish at the

Hadley Falls intakes. In addition, Alden Laboratories will prepare a report summarizing the results of the CFD modeling to evaluate the potential for a bottom weir producing flow patterns conducive to guide bottom migrants into the Canal.

Objectives:

- 1) To determine the velocities at the intake racks along the current rack alignment and surface overlay fitted with 2-inch bar spacing and evaluate the potential for exclusion/impingement at various load levels of the Hadley Falls units; and
- 2) To determine the hydraulic conditions and the technical parameters (height, length and angle) for a potential bottom weir that would produce flow patterns to guide shortnose sturgeon into the Canal.

HG&E shall contract with Alden Laboratories to perform CFD modeling of the intake to the Hadley Falls units with a proposed 2-inch rack spacing and the existing surface overlay to evaluate the approach and through-rack velocities relative to impingement and exclusion of fish at various load levels of the Hadley Falls units. The contract will also include CFD modeling of a potential bottom weir to evaluate if the weir will produce flow patterns conducive to guide bottom migrants into the Canal. Alden Laboratories will develop the CFD model using information from an existing physical model of the Dam that includes the old timber crib dam, the Hadley Falls intake area, and the gatehouse.

HG&E shall model a total of six scenarios for a potential bottom guidance weir:

- Model a bottom guidance weir for two different weir lengths (100 ft and 150 ft.);
- Model two weir alignments (near-streamline direction (0 degrees) and 15 degrees towards the old dam); and
- Model two weir heights (5 ft. and another height to be determined after results for 5 ft. height simulation).

For the simulations, the Canal flow will be fixed at 6,000 cfs and both Hadley Falls units will be running at 4,200 cfs each.

Reporting: HG&E shall complete the Phase 1 CFD Modeling studies of the Hadley Falls intake with the proposed 2-in. racks and shall summarize the data collected in a draft report including all data, and information on the methods and study procedures by September 30, 2004; to the extent possible preliminary results will be provided to the Parties by April 30, 2004. Results of the CFD Modeling studies of a proposed guidance weir will be distributed to the Parties by September 30, 2004.

3. USGS Flume Study - 2004

While there is some behavioral information available on the response of shortnose sturgeon to structures, there is no information on the swimming height of migrating shortnose sturgeon. Also, an understanding of shortnose sturgeon's response to potential modifications to the existing Hadley Falls intake rack structure and a potential alternative bar rack structure at the Holyoke Project is needed prior to modifying the existing downstream passage facilities or constructing a new facility.

Objectives:

- 1) To determine the swimming depth and behavior of yearling, juvenile and adult shortnose sturgeon at a bar rack structure;
- 2) To determine the threshold velocity for avoidance of impingement/entrainment of yearling, juvenile, and adult shortnose sturgeon at conditions present at the proposed modified Hadley Falls intake racks with 2-inch spacing; and
- 3) To determine if yearling, juvenile, and adult shortnose sturgeon can avoid impingement/entrainment at conditions present at a potential alternative bar rack facility with 2-inch spacing and velocities of about 2 fps.

Dr. Kynard of the USGS has proposed to work with HG&E to research these behavioral questions and HG&E shall conduct this research as part of the Settlement. Work will be conducted in a 20 ft. wide, 20 ft. deep, and 120 ft. long flume at the Conte Anadromous Fish Research Center. Shortnose sturgeon available for testing include sixty 4+ year cultured juveniles, twenty wild adults and juveniles, and fifty to one hundred 1+ yearlings (subject to the requirements of any Endangered Species Act (16 U.S.C. §1531, *et seq.*) permit or approval applicable to these studies). Before testing, the cultured fish will be exercised in the Exercise Flume⁴³ to improve their level of fitness. Previous flume testing of shortnose sturgeon (personal communication, Dr. Kynard) revealed that they prefer to migrate at night but are guided by structure better during the day. Thus, both day and night testing will be conducted. The tests will be separated into three parts: swimming height, behavior at a proposed modified Hadley Falls intake rack, and behavior at a potential alternative bar rack structure.

⁴³ The exercise flume will be constructed on the outside pad at the Conte Anadromous Fish Research Center. It will be 8 feet by 40 feet and will be constructed of plywood with either steel beams or wood beam supports so that the flume could be tilted to increase velocity. There will also be a head tank fed by an approximately a 16-inch pipe tapped off of the existing 30-inch supply line to the pad.

Swimming height - Juvenile and adult shortnose sturgeon will be introduced at the upper end of the flume in 20 ft. deep water. They will be acclimated to depth in a Fish Introduction Cage and then allowed to swim freely in the flume to determine acclimation time. Movement rates down the flume will be monitored using telemetry. Swimming height of juveniles and adults will be monitored using telemetry and pressure sensitive tags during their movement in the flume.

Potential modified Hadley Falls intake rack structure – Flume studies will be performed to collect information on how shortnose sturgeon would respond to modified Hadley Falls intake racks (with 2-inch spacing and existing surface overlay) for a variety of flow regimes to determine the threshold velocity for impingement.

Potential alternative bar rack structure – Flume studies will be performed to collect information on how shortnose sturgeon would respond to a bar rack structure as it could be configured at Holyoke for velocities of approximately 2 fps.

Reporting: By March 31, 2005, HG&E shall distribute Dr. Kynard's report summarizing the results of the USGS Flume Study along with HG&E's recommendation for any follow up measures to the Parties. Preliminary data on the Hadley Falls intake rack analysis will be available and distributed to the Parties by September 30, 2004.

4. Eel Migration Timing Study - 2004

HG&E shall utilize data collected at the Louver Bypass Sampling Facility to develop information on the timing of silver-phase American eel migration at the Project.

Objective: To determine the timing of migration of silver-phase American eels at the Project.

In consultation with the Parties (pursuant to Section 3.3 of the Settlement Agreement), in 2004 HG&E shall develop a plan to collect the data from the Louver Bypass Sampling Facility to develop additional understanding of the timing of eel migration at the Project; the plan will be implemented in late Summer and Fall 2005. The date, time, weather, moon phase and physical parameters (*i.e.*, water temperature, dissolved oxygen) will be recorded when eels are passed.

Reporting: The study will be completed and a draft report of study results will be distributed to the Parties by March 30, 2006.

5. USGS Flume Study - 2005

HG&E shall continue the USGS Flume Study in 2005 to evaluate the potential for a bottom weir and/or a rack with a bypass entrance to guide shortnose sturgeon.

Objectives:

- 1) To determine how shortnose sturgeon would respond to a bottom weir for guidance; and
- 2) To determine how shortnose sturgeon would respond to a bypass entrance, integral with a rack structure.

The work in 2005 will be conducted in a 10-ft. wide or 20-ft. wide flume, depending upon availability. Information will be collected on the guidance efficiency of shortnose sturgeon by placing a partial-height wall diagonally across the main flow direction. The optimal height of the wall will be determined by CFD modeling and preferred swimming height of the fish. Based on the results of the CFD modeling two angles will be tested in the flume to determine guidance efficiency.

Information of the behavior of shortnose sturgeon at a surface, a mid-depth and a bottom bypass entrance will also be collected. Results from the 2004 Louver Bypass study will be evaluated to determine sturgeon response to ramps.

Reporting: By March 31, 2006, HG&E shall distribute a report summarizing the results of the 2005 USGS Flume Study to the Parties; preliminary data will be available and distributed to the Parties by September 30, 2005.

6. Evaluation of Bascule Gate and Rubber Dam Section No. 5 - 2005

The Bascule Gate is currently used to release minimum flows into the Bypass Reach and pass outgoing surface migrants over the Dam. HG&E shall perform a desk-top study to investigate solutions to the interference of discharge flows from the Bascule Gate on the spillway entrance to the upstream passage facilities, the potential of using or modifying the Bascule Gate and/or the spillway in the vicinity of Rubber Dam Section No. 5 to pass bottom migrating fish, and how fish can be safely passed over the spillway and the apron.

Objectives:

- 1) To identify potential solutions to the interference of the Bascule Gate discharge on the entrance to the spillway fishway;
- 2) To evaluate the feasibility of using/modifying the Bascule Gate and/or the spillway in the vicinity of Rubber Dam Section No. 5 to pass shortnose sturgeon, American eels, and other migrating fish; and
- 3) To investigate how to pass fish safely downstream through the Bascule Gate and/or the spillway in the vicinity of Rubber Dam Section No. 5, over the surface of the spillway and apron and then into the Bypass Reach.

Visual observations and operational evidence indicate that releases from the Bascule Gate are interfering with attraction water flows to the entrance of the spillway lift. HG&E shall undertake a literature review and perform a preliminary engineering evaluation to identify potential solutions to Bascule Gate discharge flows interfering with the spillway entrance. The engineering evaluation will include existing flow patterns from the Bascule Gate as well as potential flow patterns identified from modifications in the Bascule Gate area. HG&E shall investigate both operational changes and physical modifications to the Bascule Gate and the spillway in the vicinity of Rubber Dam Section No. 5 to identify potential measures to alleviate the interference of Bascule Gate discharges on attraction water flows at the spillway entrance.

Although the Bascule Gate has been used to pass outgoing surface migrants over the Dam, questions have been raised about the safety of fish traveling over the spillway and apron into the Bypass Reach. HG&E shall investigate the feasibility of modifying the spillway and/or apron to safely pass fish from the headpond to the Bypass Reach downstream of the Dam. The study will include a literature review of work done at other facilities similar to the Project to identify potential options for modifying the spillway and apron. HG&E shall consult with the Parties on the results of the literature review to rank the potential alternatives and then perform a preliminary engineering analysis of the top three options to evaluate their feasibility.

The effectiveness of using the Bascule Gate to pass bottom migrants has not been proven. As described above HG&E shall undertake an extensive research and study program to evaluate alternatives for passing outgoing bottom migrants. As part of this evaluation HG&E shall perform a preliminary engineering evaluation to determine if the Bascule Gate and the spillway in the vicinity of Rubber Dam Section No. 5 could be modified to safely pass bottom migrants. The evaluation will include a literature review of prior studies and research at the Project as well as work at other facilities similar to the Holyoke Dam. The review will identify potential modifications to the Bascule Gate and spillway in the vicinity of Rubber Dam Section No. 5. HG&E shall consult with the Parties on the results of the literature review to rank the potential alternatives to modify the Bascule Gate area. Based on this ranking HG&E shall perform a preliminary engineering analysis of the top three options to evaluate their feasibility to safely pass the fish. These results will be factored into the 2005 decision-making process described in Part III below.

Reporting: The study will be completed and a draft report of study results will be distributed to the Parties by September 30, 2005.

7. Spawning Study - 2005

HG&E shall undertake a shortnose sturgeon spawning study in 2005 to identify potential spawning sites downstream of Holyoke Dam. Prior research on shortnose

sturgeon spawning sites has concentrated on the reach immediately downstream of Holyoke Dam; information is lacking for areas farther downstream.

Objective: To conduct sampling at potential sites downstream of the Holyoke Dam to determine if shortnose sturgeon spawn in those areas.

HG&E shall work with Connecticut River shortnose sturgeon researchers to determine potential spawning areas downstream of the Holyoke Dam based on preferred spawning habitat and multiple years of radio tracking information. Plankton nets will be deployed in targeted areas to attempt to capture sturgeon eggs and larvae. HG&E shall consult with the Parties (pursuant to Section 3.3 of the Settlement Agreement) and with other appropriate shortnose sturgeon researchers to develop a comprehensive study plan (with numbers of shortnose sturgeon subject to availability and the requirements of any Endangered Species Act (16 U.S.C. §1531, *et seq.*) permit or approval applicable to these studies). The study plan will be distributed for review by the Parties before implementation.

Reporting: The studies will be completed and a draft report of study results of potential additional downstream spawning sites will be distributed to the Parties no later than March 31, 2006.

III. Decision Point – 2005

Conceptually Phase 2A involves modifying the Hadley Falls intakes as an exclusion device; if these modifications are effective for excluding fish, then HG&E shall modify the Bascule Gate for passage. Conceptually Phase 2B involves constructing an alternative exclusion device and an alternative passage device (in the vicinity of Rubber Dam Section No. 5). Based on the results of the Phase 1 research, on or before September 30, 2005, HG&E shall distribute to the Parties a recommendation on whether to implement Phase 2A or Phase 2B, as described below. At that point, the Parties will have received: (i) results of the 2004 USGS Flume Study with respect to the Hadley Falls intake analysis, which should indicate threshold velocities for entrainment/impingement of yearling, juvenile and adult shortnose sturgeon; (ii) preliminary results from the 2005 USGS Flume Study of bypass entrances; (iii) results from the 2004 CFD Modeling Study of the potential to modify the Hadley Falls intake racks with the proposed 2-inch rack spacing; and (iv) results from the evaluation of the Bascule Gate and alternative passage device (in the vicinity of Rubber Dam Section No. 5).

It is the intent of the Parties that HG&E shall implement Phase 2A as set forth in Part IV below if: (i) the results of the Phase 1 studies (described above) demonstrate that HG&E can modify the existing Hadley Falls intake racks to be an effective interim (and potentially long-term) device to achieve the threshold velocity for avoidance of entrainment and impingement of fish; and (ii) the Parties have identified a potential

solution to the Bascule Gate discharge interference on the spillway fishway and a means of safely and successfully passing the fish without injury or significant impairment to essential behavioral patterns down the spillway and over the apron. If the two elements (i) and (ii) above are not confirmed by the Resource Agencies pursuant to the process described below, then HG&E shall implement Phase 2B as set forth in Part V below.

The process for determining whether HG&E shall implement Phase 2A or Phase 2B, as described below, shall be as follows: HG&E shall circulate the study results and HG&E's recommendation for Phase 2A or Phase 2B on or before September 30, 2005, and consult with the Parties pursuant to Section 3.3 of the Settlement Agreement. On or before December 31, 2005, the Resource Agencies (FWS, NOAA Fisheries, MADEP and MADFW) shall notify HG&E whether they all agree with HG&E's recommendation; in which case, HG&E shall implement that recommendation. If the Resource Agencies do not all agree with HG&E's recommendation, HG&E shall then implement Phase 2B.

IV. Phase 2A (2006-2010)

Based on the Phase 1 research (described above) and pursuant to the decision made in Part III above, in consultation with the Parties pursuant to Section 3.3 of the Settlement Agreement HG&E shall implement the work and research as outlined below for further enhancements of the downstream fish passage facilities.

Under Phase 2A the Parties intend to achieve the objectives for downstream fish passage (as stated on page 1 of this Appendix F) in the following way:

- (i) HG&E shall install and construct an interim (and potentially long-term) device by the end of 2006 that prevents entrainment and impingement at the Project based on modifications of the Hadley Falls intake racks and installation of a new trash rake structure connected with the intake racks;
- (ii) HG&E shall prepare a functional design drawing of the selected option to modify the Bascule Gate for safely and successfully passing the fish without injury or significant impairment to essential behavioral patterns and to solve interference of Bascule Gate discharge on spillway fishway, build a prototype and field test (if necessary) in 2006, with engineering/permitting in 2007, and construction in 2008;
- (iii) HG&E shall undertake additional research during the period 2006 to 2010 to ensure that the downstream passage facilities are effective for exclusion and safe and successful passage of fish over the Dam;

- (iv) HG&E shall design, engineer, and permit: (A) an alternative exclusion device, and (B) an alternative passage device in the vicinity of Rubber Dam Section No. 5 (if the modifications to the Hadley Falls intake racks are determined not to be successful as a long-term exclusion device), for safely and successfully passing the fish without injury or significant impairment to essential behavioral patterns; with construction completed in 2009, and start of effectiveness testing in 2010; and
- (v) HG&E shall implement a long-term monitoring program for shortnose sturgeon from 2011 to the end of the Project License.

The specific schedule is as follows:

2006

- Design, engineer, permit, build and complete the modifications to the existing Hadley Falls intake racks and installation of a new trash rake structure, as agreed to under Part III above (Decision Point 2005), as an exclusion device for downstream migrating fish including shortnose sturgeon to prevent entrainment and impingement at the Hadley Falls intakes. The modifications to the Hadley Falls intake racks and the installation of the new trash rake will be completed by the end of 2006 (or earlier if possible depending on River conditions and obtaining necessary permits).
- Continue to implement operational changes commenced in 2005 as agreed to by the Parties (through consultation pursuant to Section 3.3 of the Settlement Agreement) to enhance downstream passage (as described above in Phase 1).
- Prepare a functional design drawing of the selected option to modify the Bascule Gate for safely and successfully passing the fish without injury or significant impairment to essential behavioral patterns and to solve interference of Bascule Gate discharge on spillway fishway. Build prototype and field test (if necessary).
- Conduct effectiveness studies of the modifications to the Louver Bypass Discharge Pipe if implemented in 2005, as provided for in the plan approved by the FERC and the MADEP (discussed in Phase 1 above); distribute results to the Parties.
- Perform radio tracking studies of shortnose sturgeon and silver-phase American eels (as discussed more fully in Part VI below); distribute results to the Parties.

2007

- Engineer, design and permit modifications to the Bascule Gate to provide safe and successful passage for fish without injury or significant impairment to essential behavioral patterns and to solve the interference of Bascule Gate discharge on the spillway fishway.
- Continue to perform radio tracking studies of shortnose sturgeon (as described more fully in Part VI below) and use to evaluate the effectiveness of the modifications to the Hadley Falls intake racks completed in 2006; continue to perform radio tracking studies of silver-phase American eels, if necessary; distribute results to the Parties.

2008

- Provide to the Parties the results of the effectiveness testing of the modifications to the Hadley Falls intake racks and other measures completed in 2006-2007, along with HG&E's conclusion whether or not those modifications and other measures achieve the goals for exclusion in Phase 2A as stated above.
 - If HG&E concludes that such modifications to the Hadley Falls intake racks and other measures completed in 2006-07 do not achieve the stated goals, then in consultation with the Parties pursuant to Section 3.3 of the Settlement Agreement HG&E shall commence the design, engineering, and permitting of: (i) an alternative exclusion device, and (ii) an alternative passage device (in the vicinity of Rubber Dam Section No. 5).
 - If HG&E concludes that such modifications to the Hadley Falls intake racks and other measures completed in 2006-2007 do achieve the stated goals for exclusion, then HG&E shall implement a decisional process parallel to that specified in Part III above (for the Decision Point in 2005) to determine if the Resource Agencies (FWS, NOAA Fisheries, MADEP and MADFW) concur. Through that process, the Resource Agencies shall notify HG&E whether they all agree with HG&E's conclusion.
 - If the Resource Agencies concur with HG&E's conclusion, then in consultation with the Parties pursuant to Section 3.3 of the Settlement Agreement HG&E shall design, engineer, permit, and construct the modifications to the Bascule Gate for fish passage and to eliminate interference of Bascule Gate discharge with the spillway fishway.
 - If the Resource Agencies do not concur with HG&E's conclusion, then in consultation with the Parties pursuant to Section 3.3 of the Settlement Agreement, HG&E shall commence the design, engineering, and permitting of: (i) an alternative exclusion device, and (ii) an alternative passage device (in the vicinity of Rubber Dam Section No. 5), to safely

and successfully pass the fish without injury or significant impairment to essential behavioral patterns down the spillway over the apron and into the Bypass Reach, avoiding any potential flow interference problems with the spillway fishway, that will not only exclude fish from the Hadley Falls intakes without impingement, but also provide for safe and successful downstream passage of diadromous and resident fish.

- Continue to perform radio tracking studies of shortnose sturgeon (as described more fully in Part VI below) and distribute results to the Parties.
- Conduct a Population Survey for shortnose sturgeon in the Connecticut River, from Long Island Sound to Turners Falls (as described more fully in Part VI below) and distribute results to the Parties. Recapture studies will be conducted and any previously collected information will be used to calculate new estimates that could be compared to historical numbers.

2009

- As determined to be necessary through the decision process in 2008, bid, build and complete construction of the device(s) (in consultation pursuant to Section 3.3 of the Settlement Agreement).
- Continue radio tracking studies of shortnose sturgeon (as described more fully in Part VI below) and distribute results to the Parties.

2010

- Commence operation of the exclusion and passage device(s) constructed in 2009 prior to April 1, 2010.
- Consult with the Parties (pursuant to Section 3.3 of the Settlement) to develop a plan to study the effectiveness of the exclusion and passage device(s) completed in 2008-2009; implement the plan; distribute results to the Parties by January 31, 2011.
- Consult with the Parties (pursuant to Section 3.3 of the Settlement Agreement) to develop a long-term monitoring protocol for shortnose sturgeon during the term of the License for the Project, with distribution of the results annually to the Parties. If after 2010 HG&E determines, in consultation with the Parties (pursuant to Section 3.3 of the Settlement Agreement), that shortnose sturgeon are not passing safely downstream of the Project, HG&E shall consult with the Parties (pursuant to Section 3.3 of the Settlement Agreement) to determine a plan for re-evaluating the downstream passage facilities.

Plans to implement each element of Phase 2A above shall be prepared and submitted to the Parties pursuant to Section 3.3 of the Settlement Agreement. HG&E shall consult with the Parties, and/or obtain the concurrence and/or approval of that plan, pursuant to Section 3.3. Thereafter, HG&E shall file such plans with the FERC and the MADEP, and shall implement such plans as approved in writing by the FERC and MADEP.

V. Phase 2B (2006-2009)

Based on the Phase 1 research (see above) and pursuant to the decision made in Part III, above, HG&E shall implement the plan as outlined below for further enhancements of the downstream fish passage facilities.

Under Phase 2B the Parties intend to achieve the objectives for downstream fish passage (as stated on page 1 of this Appendix F) in the following way:

- (i) HG&E shall continue to implement operational changes commenced in 2005 to enhance downstream passage of shortnose sturgeon;
- (ii) HG&E shall continue studies and research to determine the appropriate alternative exclusion and passage device(s), including an angled bar rack;
- (iii) HG&E shall design/permit measures and modifications in 2007 for: (A) an alternative exclusion device, and (B) an alternative passage device (in the vicinity of Rubber Dam Section No. 5) for safely and successfully passing the fish without injury or significant impairment to essential behavioral patterns and avoiding any potential flow interference problems with the spillway fishway; construct in 2008, and start effectiveness testing in 2009;
- (iv) HG&E shall undertake additional research and additional measures from 2006 to 2009 to ensure that the downstream passage facilities are effective for exclusion and guidance as described below; and
- (v) HG&E shall implement a long-term monitoring program for shortnose sturgeon from 2010 to the end of the Project License.

The specific schedule is as follows:

2006

- Perform a full feasibility study of options for an alternative passage device (in the vicinity of Rubber Dam Section No. 5) to: (i) safely and successfully pass the fish without injury or significant impairment to essential behavioral patterns down the spillway over the apron and into the Bypass Reach, and (ii) avoid any potential

flow interference problems with the spillway fishway. Build prototype and field test (if necessary).

- Continue to implement operational changes commenced in 2005 as agreed to by the Parties (in consultation pursuant to Section 3.3 of the Settlement Agreement) to enhance downstream passage (as described above in Phase 1).
- Consult with the Parties (pursuant to Section 3.3 of the Settlement Agreement) to develop a research and study program to evaluate alternative exclusion and passage device(s).
- Perform radio tracking studies of shortnose sturgeon and silver- phase American eels; distribute results to the Parties (as described more fully in Part VI below).
- Conduct effectiveness studies of the modifications to the Louver Bypass Discharge Pipe if performed in 2005, as provided for in the plan approved by the FERC and the MADEP (discussed in Phase 1 above); distribute results to the Parties.

2007

- Design/engineer/permit: (i) an alternative exclusion device and (ii) an alternative passage device (in the vicinity of Rubber Dam Section No. 5), determined in 2006 by the Parties (in consultation pursuant to Section 3.3 of the Settlement Agreement) to safely and successfully pass the fish without injury or significant impairment to essential behavioral patterns down the spillway over the apron and into the Bypass Reach, avoiding any potential flow interference problems with the spillway fishway, that will not only exclude fish from the Hadley Falls intakes without impingement, but also provide for safe and successful downstream passage of migratory and resident fish.
- Continue to implement operational changes commenced in 2005 as agreed to by the Parties (in consultation pursuant to Section 3.3 of the Settlement Agreement) to enhance downstream passage (as described above in Phase 1).
- Continue radio tracking studies of shortnose sturgeon and distribute results to the Parties (as described more fully in Part VI below).

2008

- As designed and permitted in 2007, bid, build and complete construction of: (i) the alternative exclusion device, and (ii) the alternative passage device. .

- Continue to implement operational changes commenced in 2005 as agreed to by the Parties (in consultation pursuant to Section 3.3 of the Settlement Agreement) to enhance downstream passage (as described above in Phase 1).
- Continue radio tracking studies of shortnose sturgeon and distribute results to the Parties (as described more fully in Part VI below).
- Conduct a Population Survey for shortnose sturgeon in the Connecticut River, from Long Island Sound to Turners Falls (as described more fully in Part VI below) and distribute results to the Parties. Recapture studies will be conducted and any previously collected information will be used to calculate new estimates that could be compared to historical numbers.

2009

- Commence operation of the device(s) constructed in 2008 prior to April 1, 2009.
- Consult with the Parties (pursuant to Section 3.3 of the Settlement Agreement) to develop a plan to study the effectiveness of the alternative exclusion and passage device(s) completed in 2008; implement the plan; distribute results to the Parties by January 31, 2010.
- Consult with the Parties (pursuant to Section 3.3 of the Settlement Agreement) to develop long-term monitoring protocol for shortnose sturgeon during the term of the License for the Project, with distribution of the results annually to the Parties. If after 2009 HG&E determines, in consultation with the Parties (pursuant to Section 3.3 of the Settlement Agreement), that shortnose sturgeon are not passing safely downstream of the Project, HG&E shall consult with the Parties (pursuant to Section 3.3 of the Settlement Agreement) to determine a plan for re-evaluating the downstream passage facilities.

Plans to implement each element of Phase 2B above shall be prepared and submitted to the Parties pursuant to Section 3.3 of the Settlement Agreement. HG&E shall consult with the Parties, and/or obtain the concurrence and/or approval of that plan, pursuant to Section 3.3. Thereafter, HG&E shall file such plans with the FERC and the MADEP, and shall implement such plans as approved in writing by the FERC and MADEP.

VI. Description of Studies in Phases 2A and 2B above.

A. Radio Tracking Study

HG&E shall collect data and evaluate how downstream migrating shortnose sturgeon approach the Project; these studies will include a 5-year radio-tracking program.

HG&E shall also review recent studies of downstream eel passage work to determine their applicability to the Project. If possible, the antenna arrays installed for the shortnose sturgeon will be used to track American eel movement through the Project. A draft detailed study plan addressing the eels will be developed by HG&E with input from the Parties and Dr. Alex Haro of the USGS, and then circulated to the Parties. After consultation with the Parties pursuant to Section 3.3 of the Settlement Agreement, HG&E shall file the plan with the FERC and the MADEP, and shall implement the plan as approved in writing by the FERC and the MADEP.

Objectives:

- 1) To determine the approach and passage route(s) of radio-tagged downstream migrating shortnose sturgeon; and
- 2) To determine the approach and passage route(s) of radio-tagged downstream migrating American eels.

HG&E shall undertake a long-term radio-tracking program to monitor downstream migration of shortnose sturgeon through the Project. To determine how shortnose sturgeon approach and pass through the Project, an array of antennas will be placed along the face of the louver bypass, the Bascule Gate, the Hadley Falls intakes, the louver entrance and the upstream and downstream end of the tailrace. Large detection zone antennas will be deployed to identify if any shortnose sturgeon are coming to the Dam on the South Hadley side. HG&E shall attempt to radio tag at least 20 shortnose sturgeon per year (as previously recommended by NOAA Fisheries in its 1999 Biological Opinion). If more than 20 shortnose sturgeon are available for capture and tagging HG&E shall not limit their tagging effort to 20 fish (with numbers of shortnose sturgeon subject to availability and the requirements of any Endangered Species Act (16 U.S.C. §1531, *et seq.*) permit or approval applicable to these studies). HG&E shall attempt to capture and tag a wide range of sizes and ages of shortnose sturgeon; however, this study is proposed to be limited to wild fish and availability of the fish will determine the final size and age distribution. Stage 4 female shortnose sturgeon will not be tagged during this study.

Prior to the launch of this 5-year effort, HG&E shall put together a summary of any new radio-tagging information, and then consult with the Parties and appropriate shortnose sturgeon researchers to develop a 5-year radio-tagging/tracking study plan.

The study plan will be distributed for review and approval by the Parties before implementation.

Reporting: A draft report of study results will be distributed to the Parties no later than March of the year following each year of study.

B. Re-estimation of Shortnose Sturgeon Population - 2008

Savoy (*in prep*)⁴⁴ and Dr. Kynard (personal communication at a Shortnose Sturgeon Work Group Meeting held on February 20, 2003) recently demonstrated that periodic re-estimation of the Connecticut River shortnose sturgeon population is important to tracking any changes in the population size.

Objective: To re-estimate the size of the shortnose sturgeon population in the Connecticut River from Long Island Sound to Turners Falls.

HG&E shall conduct an updated population estimate. HG&E shall consult with NOAA Fisheries to develop a sampling regime (with numbers of shortnose sturgeon subject to availability and the requirements of any Endangered Species Act (16 U.S.C. §1531, *et seq.*) permit or approval applicable to these studies). Recapture studies will be conducted and any previously collected information will be used to calculate new estimates that could be compared to historical numbers.

Reporting: The study will be completed and a report of study results of potential changes in the shortnose sturgeon population distributed to the Parties no later than March of the year following the last year of the study.

⁴⁴ Savoy, T. (*in prep*). Population estimate and utilization of the lower Connecticut River by shortnose sturgeon. Connecticut River Ecological Study, Re-Visiting the River and the Ecological Impact of a Nuclear Power Plant. American Fisheries Society Monograph.

APPENDIX F – Shortnose Sturgeon Handling Plan, Filed as Appendix E to the Settlement Agreement

Shortnose Sturgeon Handling Plan for Holyoke Dam 2004

This plan may be updated annually as appropriate

Shortnose sturgeon (SNS) are listed as a federally and state endangered species. Historically, over one hundred SNS have been lifted upstream at Holyoke Dam. With the use of radio tags and PIT tags, it has been determined that many SNS also migrate downstream of the Holyoke Dam. In the past, SNS have been found at Holyoke in the spillway lift, the attraction water flume, the tailrace attraction water channel, the bypass reach pools and the dam apron pools. This plan addresses how any SNS found at the Holyoke Dam will be handled and how this handling will be documented during 2004. SNS may be encountered by personnel during fish lift operations, at the downstream sampling station and in the event of stranding. Procedures for handling fish and documenting these interactions are outlined below. All contact information and the appropriate reporting form follow these procedures. All personnel counting fish at the fish lift counting windows and louver bypass fish sampler will be trained to properly handle SNS by Micah Kieffer or Boyd Kynard from USGS, Conte Anadromous Fish Research Center.

Fish Lift Operations

Due to concerns regarding the safety of downstream passage for SNS, SNS are not currently being passed above the Dam. Should any SNS be found in the fish lift, the licensee shall implement the procedures and reporting requirements outlined below. A number of Connecticut River SNS carry inactive radio tags that were implanted during earlier studies of SNS migratory behavior. All these SNS were also PIT tagged. A list of these PIT tag numbers will be provided to personnel counting fish. If any of these fish are captured, Micah Kieffer or Boyd Kynard from USGS, Conte Anadromous Fish Research Center will be contacted (see contact information below). They will remove the radio tags and record information on the internal condition of these SNS. If any SNS carrying an internal radio tag with an external antenna are observed, Micah Kieffer or Boyd Kynard from USGS, Conte Anadromous Fish Research Center, will be contacted and will respond and assess the condition of these fish.

1. For each SNS detected, the licensee shall record the weight, length, and condition of the fish. Each SNS will be checked for PIT, Carlin, radio, or other tags (see above). Tag numbers will be recorded and if not previously tagged, the fish may be tagged with a PIT tag. River flow, bypass reach minimum flow, and water temperature will be recorded. All relevant information will be recorded on the

reporting sheet (*SHORTNOSE STURGEON REPORTING SHEET FOR THE HOLYOKE PROJECT*, a copy of which is attached hereto).

2. The licensee shall follow the contact procedure outlined below to obtain a contact with the appropriate ESA permit/approval for handling SNS.
3. If alive and uninjured, the SNS will be immediately returned downstream. A long handled net will be used to place the SNS in the tailrace from the deck behind the powerhouse.
4. If any injured SNS are found, the licensee shall report immediately to NOAA Fisheries (see contact information below). Injured fish must be photographed and measured, if possible, and the reporting sheet must be submitted to NOAA Fisheries within 24 hours. If the fish is badly injured, the fish should be retained by the licensee, if possible, until obtained by a NOAA Fisheries recommended facility for potential rehabilitation
5. If any dead SNS are found, the licensee must report immediately to NOAA Fisheries (see contact information below). Any dead specimens or body parts should be photographed, measured and preserved by the licensee until they can be obtained by NOAA Fisheries for analysis.

Downstream Sampling Station

SNS may be encountered by personnel operating the downstream sampling station. Due to the shallow depths and tight turns of the sampling station table, it may not be appropriate for SNS to stay on the table and return to the River through the table exit. To help monitor downstream passage of SNS and to minimize the likelihood of adverse affects, the licensee shall implement the following procedures and reporting requirements:

1. Any SNS observed in the sampling station will be immediately removed with a net and placed in an appropriate holding tank. SNS will not be allowed to stay on the sampling station table. For each fish detected, the licensee shall record the weight, length, and condition. Each SNS will be checked for PIT, Carlin, radio, or other tags. The licensee shall record tag numbers and, if not previously tagged, the fish may be tagged with a PIT tag. A number of Connecticut River SNS carry inactive radio tags that were implanted during earlier studies of SNS migratory behavior. All these SNS were also PIT tagged. A list of these PIT tag numbers will be provided to personnel counting fish. If any of these fish are captured, Micah Kieffer or Boyd Kynard from USGS, Conte Anadromous Fish Research Center will be contacted. They will remove the radio tags and record information on the internal condition of these SNS. If any SNS carrying an internal radio tag with an

external antenna are observed, Micah Kieffer or Boyd Kynard from USGS, Conte Anadromous Fish Research Center will be contacted and will respond and assess the condition of these fish. River flow and water temperature will be recorded. All relevant information will be recorded on the reporting sheet (*SHORTNOSE STURGEON REPORTING SHEET FOR THE HOLYOKE PROJECT*, see attached form).

2. The licensee shall follow the contact procedure outlined below to obtain a contact with the appropriate ESA permit/approval for handling SNS.
3. If alive and uninjured, the SNS will be immediately returned downstream. A long handled net will be used to place the SNS in the tailrace.
4. If any injured SNS are found, the licensee shall report immediately to NOAA Fisheries (see contact information below). Injured fish must be photographed and measured, if possible, and the reporting sheet must be submitted to NOAA Fisheries within 24 hours. If the fish is badly injured, the fish should be retained by the licensee, if possible, until obtained by a NOAA Fisheries recommended facility for potential rehabilitation.
5. If any dead SNS are found, the licensee must report immediately to NOAA Fisheries (see contact information below). Any dead specimens or body parts should be photographed, measured and preserved by the licensee until they can be obtained by NOAA Fisheries for analysis.

Shortnose Sturgeon Stranding

The potential exists for SNS to be stranded in pools below the Dam whenever there is a significant change in the bypass flows or in minimum flows in the bypass reach. If this situation occurs, these pools need to be checked as soon as possible for the presence of SNS and the following protocol shall be followed:

1. Designated HG&E employees and fish lift operation staff must monitor the pools below the Dam as soon as possible after such a change.
2. The licensee shall follow the contact procedure outlined below to obtain a contact with the appropriate ESA permit/approval for handling SNS.
3. For each fish removed from the pool, the licensee shall record the weight, length, and condition. Each SNS will be checked for PIT, Carlin, radio, or other tags. Tag numbers will be recorded and if not previously tagged, the fish may be tagged with a PIT tag. River flow, bypass reach minimum flow, and water temperature will be recorded. All relevant information will be recorded on the reporting sheet

(SHORTNOSE STURGEON REPORTING SHEET FOR THE HOLYOKE PROJECT, see attached).

4. If stranded but alive and uninjured, the SNS will be moved to a pool in the bypass reach that will provide egress out of the area.
5. If any injured SNS are found, the licensee shall report immediately to NOAA Fisheries (see contact information below). Injured fish must be photographed and measured, if possible, and the reporting sheet must be submitted to NOAA Fisheries within 24 hours. If the fish is badly injured, the fish should be retained by the licensee, if possible, until obtained by a NOAA Fisheries recommended facility for potential rehabilitation.
6. The licensee shall report any dead fish immediately to NOAA Fisheries (see contact information below). Any dead specimens or body parts should be photographed, measured and preserved by the licensee until they can be obtained by NOAA Fisheries for analysis.
7. Contact Rich Murray (HG&E 413-536-9453; Chris Tomichek (Kleinschmidt Associates 860-526-2358; Bob Stira (NGS 860-810-1948).

Contact information:

- If any SNS are detected – contact Conte Anadromous Fish Lab: Micah Kieffer (413) 863-3817; or Boyd Kynard (413) 863-3807.
If unavailable, contact Massachusetts Division of Fish and Wildlife
Caleb Slater (508) 792-7270 (133); or Mark Tisa (508) 792-7270 (129).
- Within 24 hours of any stranding event or contact with an injured or dead SNS, contact NOAA Fisheries Northeast Regional Office – Pat Scida, (978-281-9208) or Julie Crocker (978-281-9328 x6530) and fax any reporting sheets to 978-281-9394.

Reports at end of passage seasons

- At the end of the upstream and downstream passage seasons, copies of all reporting sheets will be sent to:

Pat Scida
Protected Resource Division
NOAA Fisheries
One Blackburn Drive
Gloucester, MA 01930-2298

Chris Tomichek
Kleinschmidt Associates
161 River Street
P.O. Box 1050
Deep River , CT 06417

Boyd Kynard
S.O. Conte Anadromous Fish Research
Center
P.O. Box 796
Turners Falls, MA 01376

Caleb Slater
Massachusetts Div. Of Fisheries
& Wildlife
One Rabbit Hill Road
Westborough, MA 01581

Project Nos. 2004-075 and 11607-002

138

SHORTNOSE STURGEON REPORTING SHEET FOR THE HOLYOKE PROJECT

Date: _____ Time: _____

Physical conditions

Is spill being released over the dam? YES NO

What is the approximate gaged river flow? _____ (Ex. 45,000 cfs)

What is the approximate gaged minimum flow in the bypass reach? _____

What is the approximate gaged minimum flow in the canal reach? _____

Water temperature (°C): at surface _____ and/or at bottom _____

Are fishways operating (circle) YES NO

If yes, circle one or both: TAILRACE SPILLWAY

Is project generating? YES NO

If yes, what units are currently being operating? UNIT1 UNIT2

Location from where species was recovered (circle): TAILRACE LIFT

SPILLWAY LIFT DAM APRON POOLS ATTRACTION WATER STRUCTURE

CANAL BYPASS OTHER _____

If fish lift, estimate condition of lift: EMPTY FEW FISH MODERATE FULL
VERY FULL*Species information:*

Total Length _____ Fork length: _____ Weight: _____

Condition of fish: _____

Does the sturgeon have visible injuries or abrasions: YES NO

If Yes, circle and code area of abrasions on sturgeon diagram on back side of sheet.

Was sturgeon previously tagged? YES NO

If tagged, what type? CARLIN PIT RADIO OTHER _____

What is the tag number? _____

If not tagged, did you tag the fish? YES NO

If yes, what type of tag and ID number? TYPE _____ ID# _____

Project Nos. 2004-075 and 11607-002

139

Comments/other:_____

_____.

Name of watch observer:_____

Observer's
Signature:_____

Abrasion Codes**None****Light**

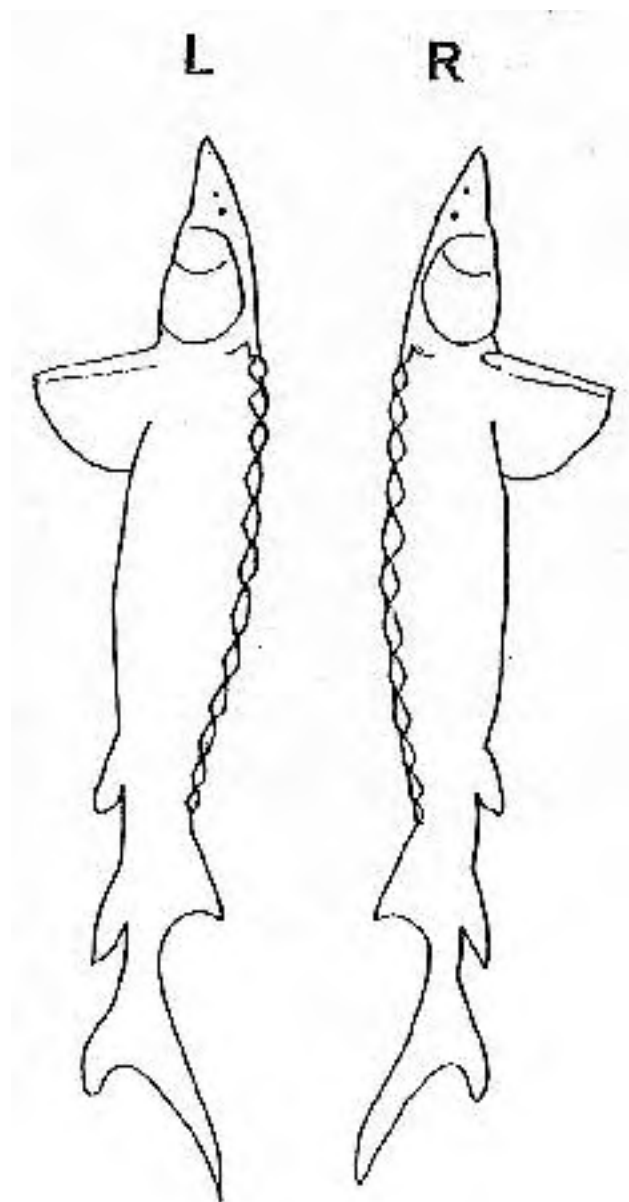
Whitening or smoothed scutes,
Early sign of skin abrasion.

Heavy

Large portion of skin red, scutes
excessively worn,
Damaged, or missing; patches
of skin missing,
Boney structures exposed;
flaccid musculature.

Moderate

Early sign of redness on skin,
scutes or fins, Erosion of skin
over bony structures,
Loss of skin pigment



APPENDIX G – No. 2 Overflow Operating Procedures, Filed as Appendix D to the Settlement Agreement

APPLICABILITY

This procedure applies to any time that the Upstream Fish Passage facilities are operational (that is whenever the attraction water is on).

INSTRUCTIONS

1. The Gatehouse Operator continually monitors canal operations as part of normal duties. During the periods of time when Hadley Falls Station upstream fish passage is operational, the No. 2 Overflow Gates shall be maintained in the closed position. This applies to gate numbers 2, 3 and 4. This measure will eliminate migrating fish from entering the raceway near the overflow and becoming stranded.
2. During fish passage, the No. 2 Overflow gates can only be operated in the event of a major failure of canal automation or an emergency condition causing the Second Level Canal to potentially overtop the canal wall. If operation of the No. 2 Overflow gates occurs, the Gatehouse Operator shall immediately contact the Operation and Maintenance Supervisor or the Hydro Superintendent. An inspection of the raceway area will be required to avoid any stranding of fish in the pool area below the waste archways.
3. All operations of the No. 2 Overflow will be logged in the Gatehouse log book and will include the date, time, and reason for operation.

47 FERC ¶62,298, Linweave, Inc., Project No. 2768-002-Massachusetts, (Jun. 29, 1989)

<http://prod.resource.cch.com/resource/scion/document/default/%28%40%40FERC-FEG-02+47FERCP62298PAGE63498%29200996112845546DOC20217>

Linweave, Inc., Project No. 2768-002-Massachusetts

[63,498]

[¶62,298]

Linweave, Inc., Project No. 2768-002-Massachusetts

Order Issuing New License (Minor Project)

(Issued June 29, 1989)

Fred E. Springer, Director, Office of Hydropower Licensing.

Linweave, Inc. has filed a license application under Part I of the Federal Power Act (Act) to continue to operate and maintain the Albion Mill (A Wheel) Project, located on the Holyoke Canal, in Hampden County, Massachusetts. The hydroelectric facilities located along the Holyoke Canal system affect navigable waters of the United States.¹ The license for the project, which was issued on July 6, 1977 [59 FPC 403], with an effective date of March 1, 1941, expires on February 28, 1991. The existing license waived section 15 of the Act only as it relates to federal takeover.

Notice of the application has been published. No protests were filed in this proceeding, and no agency objected to issuance of this license.

[63,499]

Comments received from interested agencies and individuals have been fully considered in determining whether to issue this license. Motions to intervene were filed by the City of Holyoke Gas & Electric Department and the Holyoke Water Power Company in order to be parties in this proceeding. HWP also requests that any license issued which utilizes HWP's Holyoke Canal System water be conditioned, as was the previous license, to require cooperation with HWP as the licensee for the Hadley Falls Project No. 2004. Article 202 is included to provide for appropriate cooperation.

Comprehensive Development

Sections 4(e) and 10(a)(1) of the Act require the Commission to consider and balance in the public interest all uses of the waterway on which a project is proposed to be located.

The Albion Mill (A Wheel) Project has operated under the terms of its existing license since 1977. In the environmental assessment (EA), the staff analyzed the environmental effects of the continued operation of the project. Neither the resource agencies nor staff identified any significant conflicts between continued operation of the project as proposed by the applicant, and the environmental values of the project area.

Three alternatives to relicensing the Albion Mill (A Wheel) Project were also considered by the staff in its EA. They include: (1) issuance of an annual license; (2) issuance of a non-power license; and (3) denial of a license application. No alternative was identified that would have a higher or better use of the project in terms of providing power and environmental benefits without significant environmental cost.

Section 10(a)(2) of the Act also requires the Commission to consider the extent to which a proposed project is consistent with an existing federal, state, or local comprehensive plan. Under section 10(a)(2), federal and state agencies filed seven comprehensive plans that address resources in Massachusetts. Of these plans, staff identified and reviewed four plans relevant to this project.² No conflicts between the proposed Albion Mill (A Wheel) Project and these four plans were found.

Therefore, the project as conditioned is determined to be best adapted to a comprehensive plan, pursuant to section 10(a) of the Act, for improving a waterway and would provide for adequate protection, mitigation, and enhancement of fish and wildlife pursuant to section 10(j) of the Act.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the Act requires the Commission to include license conditions, based on recommendations of federal and state fish and wildlife agencies, for the protection, mitigation, and enhancement of fish and wildlife. The environmental assessment for the Albion Mill (A Wheel) Project addresses the concerns of the federal and state fish and wildlife agencies; however, recommendations are not needed for continued operation of the project.

ECPA Findings

Section 10(a)(2)(C) and section 15(a) of the Federal Power Act, as amended by the Electric Consumers Protection Act of 1986 (ECPA), requires the Commission to consider in writing the following factors in issuing new licenses.

The following discussions apply individually and collectively to the eight hydro projects owned and operated by Linweave, Inc. The eight projects are identified by FERC project numbers: 2497, 2758, 2766, 2768, 2770, 2771, 2772, and 2775.

Consumption Efficiency Improvement Programs (Section 10(a)(2)(C))

Since the applicant's primary business is the manufacture of paper products and not the generation or sale of electric power, no discussion of on-going or planned conservation and load-management programs is required in this document.

The Plans and Abilities of the Applicant to Comply with the Articles, Terms, and Conditions of Any License Issued to it and Other Applicable Provisions of Part I of the FPA (Section 15(a)(2)(A))

The staff has reviewed the plans of the applicant to comply with the articles, terms, and conditions of any license issued to Linweave, Inc.

A review of the compliance record of the applicant indicates that the applicant's compliance with the terms and conditions of its current license has been satisfactory. The staff concludes that the applicant has demonstrated its ability to comply in a good faith manner

[63,500]

with all articles, terms, and conditions of the license, and the staff concludes that the applicant would perform in a competent manner if issued a new license for the project.

The Plans of the Applicant to Manage, Operate, and Maintain the Project Safely (Section 15(a)(2)(B))

The staff has reviewed the applicant's plans to manage, operate, and maintain the project safely. There is no dam within the project boundaries to operate and maintain.

The eight projects draw carefully prescribed quantities of water from the Second Level Canal and discharge it to the Connecticut River below the projects. There is a flood wall located between the eight projects and the Connecticut River that ensures protection during flood conditions. When the river elevations reach 62 feet or higher, the eight projects are shut down and the headgates and tailrace gates are closed. The City of Holyoke Department of Public Works (DPW) is responsible for implementing the flood wall operation schedule and closing the tailrace gates of the eight projects.

The applicant has operated the eight projects with a perfect employee safety and public safety record. There have been no deaths or lost-time injuries to employees from project operations, nor is there any record of injury or death to the public within the project boundaries.

Based upon a review of the available information on the project safety plans, the staff concludes that the applicant is capable of managing, operating, and maintaining the project in a safe manner.

The Plans and Abilities of the Applicant to Operate and Maintain the Project in a Manner Most Likely to Provide Efficient and Reliable Electric Service (Section 15(a)(2)(C))

The staff has reviewed the operation inspection reports by the NYRO and the applicant's project operation reports.

The applicant has full time employees in its engineering department that monitor the eight projects, including physically checking each unit several times daily. Additionally, the projects have automatic safety devices to shut down the units in case of abnormal operating conditions.

The applicant cleans the trashracks and lubricates the mechanical machinery regularly. The applicant provides for periodic inspection of the penstock and provides maintenance when needed.

The applicant has reported a total of seven unscheduled outages for the eight projects over the last five years. The outages ranged in length from 48 days to 114 days during which time the equipment was repaired. The applicant has rebuilt and/or overhauled seven of the generating units since February 1979 when the applicant purchased the eight projects.

The applicant has no plans to increase generation at the eight projects. The main reason for this is that the applicant is entitled to withdraw only a carefully prescribed quantity of water from the Second Level Canal under the terms of certain indenture agreements with HWP.

The applicant is in the paper-products manufacturing business, which is a highly competitive field and is very energy-intensive. Because of the competition in the paper-products market, the applicant must operate the project in the most efficient and reliable manner to maximize electric power sales revenues available to offset power purchases for use in its paper manufacturing operations.

The staff concludes that the project is being operated in an efficient and reliable manner.

The Need of the Applicant Over the Short and Long Terms for the Electricity Produced by the Project to Serve Its Customers (Section 15(a)(2)(D))

The applicant, Linweave, Inc., is a manufacturer of paper products and, as such, does not sell any of the electrical output of the eight hydroelectric projects (which it owns and operates as the current licensee) to end-use customers. Therefore, this document does not address the applicant's need for the electricity generated by the eight projects to serve its customers. The paper-products manufacturing business is today a highly competitive industry. Production costs in this industry are very energy-intensive, due to the large amounts of electric energy used for the manufacture of paper. When deprived of a low-cost source (or sources) of electric energy, a paper manufacturer cannot survive in the market place for paper products.

All eight of the hydropower projects for which the applicant is applying for new licenses are operated in the run-of-the river mode; and, as a result, the capacity and energy produced by them depend upon the available streamflow provided by the Second Level Canal of the Holyoke Water Power Company (HWP). This flow is subject to seasonal and yearly variations. The applicant's electric power demands at the several paper mills are determined by factors which are in no way correlated with water flow in the canal system. Because of this, and for other reasons affecting the applicant's paper-making electrical energy costs, Linweave has found it to be economically advantageous to sell the output of the eight

[63,501]

projects to a local electric utility and purchase the power required by the Linweave paper mills.

The total net electrical output from all eight of the projects is currently being sold, and is expected to continue to be sold to Fitchburg Gas and Electric Light Company (FGELC), pursuant to a power sales agreement dated March 25, 1982.

The applicant's present and future need for the electric power produced by the eight hydro projects, with which this document is concerned, can be stated in few words: revenues received from the sale of project capacity and energy are used to offset the cost of capacity and energy purchased on an "as-needed, total requirements" purchase agreement with a local utility, thus improving Linweave's competitive position in the paper products marketplace, which may prove necessary for industrial survival.

The total installed capacity of the eight hydro projects is 3.362 megawatts (MW), and the applicant estimates that the projects are capable of producing an average of 16,997 megawatthours (MWh) of energy annually.

The staff concludes that there is a need for the project power over the short and the long term.

The Existing and Planned Transmission Services of the Applicant (Section 15(a)(2)(E))

If the applicant is issued new licenses for the eight hydro projects listed above, no changes of the existing transmission system, its operation, or operating characteristics would occur as a result thereof, and none are planned.

If new licenses are denied, the transmission system, or systems associated with the eight projects, would no longer be required, since the applicant would no longer generate power to sell. The applicant would continue to purchase "all requirements" power required for the operation of the paper mills from a local utility. Transmission would not be affected by denial of the licenses.

The staff concludes that the transmission services are adequate as they currently exist.

Whether the Plans of the Applicant will be Achieved, to the Greatest Extent Possible, in a Cost Effective Manner (Section 15(a)(2)(F))

The Albion Mill was constructed in 1877 and the present hydroelectric generating unit was installed in 1954 and rebuilt in 1983. No new construction is proposed. The annual cost of operating the project would be its annual operation and maintenance costs. Continued future project operation would serve to provide an economically efficient source of energy for Linweave, Inc. The staff concludes that the project is economically beneficial.

The Applicant's Record of Compliance with the Terms and Conditions of the Existing License (Section 15(a)(3))

The compliance records of Linweave, Inc., with the terms and conditions of its existing licenses, are satisfactory. Further, the licensee has maintained the projects in a satisfactory manner.

The licensee is reminded that failure to comply with the terms and conditions of this license will subject it to the enforcement and penalty provisions of section 31 of the Federal Power Act.

Term of License

Section 15 of the Act, as amended by ECPA specifies that any license issued under section 15 shall be for a term which the Commission determines to be in the public interest, but not less than 30 years, nor more than 50 years from the date the license is issued. This provision is similar to pre-ECPA Commission policy, which was to establish from the expiration date of the prior license, 30-year terms for those projects which proposed no new construction or capacity, 40-year terms for those projects that proposed a moderate amount of new development, and 50-year terms for those projects that proposed a substantial amount of new development.³

Linweave, Inc. proposes no modifications to the existing project facilities or change in operation of the project. However, the existing license will not expire until February 28, 1991. Accordingly, the new license for the project will be for a term of 30 years from the expiration of the existing license.

Summary of Findings

An EA was issued for this project. Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the EA attached to this order. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if operated and maintained in accordance with the requirements of this license. Analysis of related issues

[63,502]

is provided in the Safety and Design Assessment attached to this order.

The Director, Office of Hydropower Licensing, concludes that the project would not conflict with any planned or authorized development, and would be best adapted to comprehensive development of the waterway for beneficial public uses.

The Director orders:

(A) This license is issued to Linweave, Inc. (licensee), for a period of 30 years, effective March 1, 1991, to operate and maintain the Albion Mill (A Wheel) Project. This license is subject to the terms and conditions

of the Act, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, shown by exhibit G:

FERC

Exhibit	No.	Showing
---------	-----	---------

G-1	2768-5	Project Location
-----	--------	------------------

(2) Project works consisting of: (a) a gated intake with submerged trashracks located on the Second Level Canal; (b) a 180-foot-long, 8-foot-diameter steel penstock; (c) a single runner, Francis turbine directly coupled to a 312-kilowatt (kW) Westinghouse generator; (d) a 260-foot-long, 16-foot-wide by 9-foot-high arched, brick-lined tailrace tunnel; (e) a concrete gated outlet structure where the tailwater empties into a channel that leads to the Connecticut River; (f) a 0.6-kilovolt (kV), 650-foot-long transmission line, and a 13.8-kV, 90-foot-long transmission line; and (g) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of exhibits A and F recommended for approval in the attached Safety and Design Assessment.

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project, all portable property that may be employed in connection with the project and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The exhibit G described above and those sections of exhibits A and F recommended for approval in the attached Safety and Design Assessment are approved and made part of the license.

(D) The following sections of the Act are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates to public notice and to the acceptance and expression in the license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15; 16; 19; 20; and 22.

(E) This license is subject to the articles set forth in Form L-9 [54 FPC 1852] (October 1975), entitled "Terms and Conditions of License for Constructed Minor Project Affecting Navigable Waters of the United States," and the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective March 1, 1991:

For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 416 horsepower.

Article 202. The Licensee shall cooperate with the licensee for Project No. 2004 in order that the conditions of Article 16 of the license for Project No. 2004 can be fulfilled.

Article 401. Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or provide for the construction, operation, and maintenance of such fishways, as may be prescribed by the Secretary of the Interior pursuant to section 18 of the Federal Power Act.

Article 402. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance

with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of

[63,503]

this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

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

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

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

describing the type of interest and location of the lands to be conveyed (a marked exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an

[63,504]

application for prior approval, the licensee may convey the intended interest at the end of that period.

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

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

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

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

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

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

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(G) This order is issued under authority delegated to the Director and is final unless appealed to the Commission by any party within 30 days from the issuance date of this order. Filing an appeal does not stay the effective date of this order or any date specified in this order. The licensee's failure to appeal this order shall constitute acceptance of the license.

Environmental Assessment¹

Federal Energy Regulatory Commission

Office of Hydropower Licensing

Division of Project Review

Date: June 16, 1989

Project name: Albion Mill, A Wheel, Hydroelectric Project

FERC Project No. 2768-002

A. Application

1. Application type: New minor license
2. Date filed with the Commission: November 25, 1988
3. Applicant: Linweave, Inc.
4. Water body: Holyoke Canal; River basin: Connecticut
5. Nearest city or town: Holyoke (See figure 1.)
6. County: Hampden; State: Massachusetts

B. Purpose and Need for Action

1. Purpose.

Linweave estimates the average annual energy generation of the Albion Mill, A Wheel, Hydroelectric Project is 1,795 megawatthours. Project power is sold to the Fitchburg Gas and Electric Light Company.

2. Need for power.

The power from the project is useful in meeting a small part of the need for power projected for the New England Power Pool area of the Northeast Power Coordinating Council (NPCC) region. Power generated at the project

[63,505]

displaces fossil-fueled power generation in the NPCC region, thus conserving nonrenewable fossil fuels and reducing the emission of noxious by-products caused by the combustion of fossil fuels.

C. Proposed Project and Alternatives

1. Description of the proposed action. (See figure 2.)

The existing operating project was issued an initial license in 1977, which will expire in 1991. The licensee has filed for a new license for the continued operation of the project. The existing, operating project consists of: (i) a gated intake with submerged trashracks located on the second level canal of the Holyoke Power Company; (ii) an 8-foot-diameter penstock 180 feet long; (iii) a 312-kW generating unit located in the Albion Mill building; (iv) a 16-foot-wide by 9-foot-high arched brick-lined tailrace tunnel 260 feet long extending from the draft tube to a concrete outlet structure; (v) a concrete gated outlet structure where tailwater empties into a channel that leads to the Connecticut River; (vi) a 13.8-kV transmission line 475 feet long that connects the project to an existing transmission line; and (vii) appurtenant facilities. The project operates in a run-of-river mode. Linweave does not propose any construction of change in project operation. The Holyoke Water Power Company controls flows from the Connecticut River into the canal system under a FERC major license granted to Project No. 2004 [42 FERC ¶62,166].

2. Applicant's proposed mitigative measures.

Since Linweave proposes to continue operating the project as in the past, with no new construction, no changes to the hydroelectric project, and no changes in the use and release of water, Linweave proposes no mitigative measures.

3. Federal lands affected.

No.

4. Alternatives to the proposed project.

a. *Issuance of an annual license.* Section 15(a) of the Federal Power Act (Act), [16 U.S.C. §808](#) (a), provides for the issuance of annual licenses to the prior licensee if the license expires pending the relicensing determination. Under this alternative, an annual license would continue to be issued to Linweave until a new license is issued. The annual license contains the same terms as the expired license, thereby maintaining the status quo.

b. *Issuance of a non-power license.* Section 15(f) of the Act, §808(b), authorizes the Commission to issue a license for nonpower use when the Commission "finds that in conformity with a comprehensive plan for improving or developing a waterway or waterways for beneficial public uses all or part of any licensed project should no longer be used or adapted for use for power purposes." A license that is granted by the Commission for nonpower use is temporary. When the Commission finds that a state, municipality, interstate agency, or another federal agency is authorized and willing to assume regulatory supervision of the lands and facilities included under the nonpower license and does so, the Commission shall thereupon terminate the nonpower license.

c. *Denial of the license application.* Denial of the license application could lead to removal of the power facilities and removal of all project works.

D. Consultation and Compliance

1. Fish and wildlife agency consultation (Fish & Wildlife Coordination Act).

a. U.S. Fish & Wildlife Service: Yes.

b. State(s): Yes.

c. National Marine Fisheries Service: Yes.

2. Section 7 consultation (Endangered Species Act).

a. Listed species: Present.

b. Consultation: Not required.

Remarks: The federally listed endangered shortnose sturgeon under the jurisdiction of the National Marine Fisheries Service (NMFS) inhabits the lower segment of the Connecticut River from the river's mouth upstream to the Holyoke dam. A small landlocked population is found in the pool above the Holyoke dam (Taubert, 1980). Dadswell *et al.* (1984) estimated that between 800 and 1000 shortnose sturgeon inhabit the lower portion (below Holyoke) of the Connecticut River. The NMFS reports that due to the trashrack spacing, any sturgeon which might enter the canal would be prevented from entrainment into the project (personal communication, Chris Mantzaris, staff, National Marine Fisheries Service, Gloucester, Massachusetts, June 13, 1989).

3. Section 401 certification (Clean Water Act).

Required; applicant requested certification on 10/17/88.

Status: Granted by the certifying agency on 03/30/89.

4. Cultural resource consultation (Historic Preservation Act).

a. State Historic Preservation Officer: Yes.

b. National Park Service: Yes.

c. *National Register* status: Eligible or listed.

d. Council: Not required.

e. Further consultation: Not required.

[63,506]

Remarks: The project is adjacent to the Holyoke Canal System, a property listed in the *National Register of Historic Places*. Since there would be no redevelopment, new construction, or changes to the exterior of the property, the project would not affect the canal system or any other *National Register* or eligible properties. The SHPO concurs with this finding (letter from Valerie A. Talmage, Executive Director, Massachusetts Historical Commission, and State Historic Preservation Officer, Boston, Massachusetts, December 9, 1988).

5. Recreational consultation (Federal Power Act).

a. U.S. Owners: No.

b. National Park Service: Yes.

c. State(s): Yes.

6. Wild and scenic rivers (Wild and Scenic Rivers Act).

Status: None.

7. Land and Water Conservation Fund lands and facilities (Land and Water Conservation Fund Act).

Status: None.

E. *Comments*

1. The following agencies and entities provided comments on the application or filed a motion to intervene in response to the public notice dated 03/27/89.

Commenting agencies *Date of letter*
and other entities

Department of the Army,

New England Division

Corps of Engineers 05/11/89

Environmental Protection

Agency 05/17/89

Department of the Interior 05/24/89

Massachusetts Division of

Fisheries and Wildlife 05/30/89

Motions to intervene *Date of motion*

City of Holyoke, Gas and

Electric Department 03/28/89

Holyoke Water Power Company 05/24/89

2. The applicant did not respond to the comments or motion(s) to intervene.

F. *Affected Environment*

1. General description of the locale. (See figure 3.)

a. *Description of the Connecticut River Basin.*

The Connecticut River Basin, with a drainage area of 11,765 square miles, is the largest river basin in New England. Extending from the northernmost part of New Hampshire to Long Island Sound, the river basin has a maximum length in a north-south direction of about 280 miles and a maximum width of about 62 miles. The total drainage area of the basin is 11,765 square miles. The principal tributaries to the mainstem Connecticut River, by state, are the Passumpsic, White, West, Ottauquechee, and Black Rivers in Vermont; the Ammonoosuc, Mascoma, Ashuelot, and Sugar Rivers in New Hampshire; the Millers, Deerfield, Chicopee, and Westfield Rivers in Massachusetts; and the Farmington River in Connecticut.

This complex of rivers and tributaries constitutes one of the most extensively developed hydropower systems in the U.S. There is now a major effort by federal, state, and private sectors to restore Atlantic salmon to the Connecticut River Basin.

The project is located in a heavily industrialized setting between the second level of the Holyoke Canal system and the Connecticut River. The climate is typical of inland Connecticut and Massachusetts with an average temperature of 49.8 degrees Fahrenheit and an average annual precipitation of 44.39 inches.

b. *Licensed and exempted projects.*

There are 62 existing licensed projects and 38 exempted projects in the Connecticut River Basin, as of June 1, 1989.

c. *Pending applications.*

There are 10 pending license applications in the Connecticut River Basin, as of June 1, 1989.

d. *Cumulative impacts.*

Cumulative impacts are defined as impacts on the environment that result from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions regardless which agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 C.F.R., Part 1508.7).

A target resource is an important resource that may be cumulatively affected by multiple development within a basin. The staff identified Atlantic salmon as the target resource in the Connecticut River Basin (Federal Energy Regulatory Commission, 1986). The selection was based on the regional significance and geographic distribution of this species within the river basin. This anadromous fishery resource is described below in section F(2d). Impacts to Atlantic salmon are discussed in section G.

2. Descriptions of the resources in the project impact area (Source: Linweave, Inc., application, exhibit E, unless otherwise indicated).

[63,507]

a. *Geology and soils*: Bedrock in the project area is interbedded sandstone, shale, conglomerate, and basaltic lava. The glacial till deposits that lie on the glaciated surface of the bedrock are overlain by varied glacial lake deposits. The original dry, sandy, surface soils in the project area have been highly altered by construction of the project and by fill and construction activities associated with urban development of the area.

b. *Streamflow*: Water flow in the canal system is controlled at the canal gatehouse in order to supply necessary water to various hydropower and industrial facilities along the canal. The amount of flow entering the canal system ranges from no flow, when the gatehouse is shut down, to 5,155 cubic feet per second, which is the maximum hydraulic capacity of the canal.

c. *Water quality*: The Connecticut River upstream of Holyoke dam is classified as Class B water by the Massachusetts Division of Water Pollution. Class B water is suitable for primary and secondary contact recreation and fish and wildlife resources. Class B water must have dissolved oxygen (DO) levels greater than 5.0 milligrams per liter (mg/l) and a pH between 6.5 and 8.0. The first level canal is classified as Class C. Class C water is suitable for secondary contact recreation and fish and wildlife resources and must have a DO level greater than 5.0 mg/l and a pH between 6.5 and 9.0 standard units. Water in the project area conforms to the state water quality standards.

d. *Fisheries*:

Anadromous: Present.

Anadromous fish species found in the Connecticut River in the vicinity of the project include American shad, Atlantic salmon, blueback herring, sea lamprey, striped bass, shortnose sturgeon, and American eel (catadromous).

Resident: Present.

Resident fish species found in the Connecticut River in the vicinity of the project include carp, channel catfish, smallmouth bass, largemouth bass, spottail shiner, white perch, bluegill, rainbow trout, and brown trout.

e. *Vegetation*: Dominant vegetative species in the vicinity of the project include oak, maple, white pine, pitch pine, grasses, and ornamental shrubs.

f. *Wildlife*: Undeveloped land in the project area provides habitat for the gray squirrel, eastern cottontail rabbit, raccoon, muskrat, beaver, weasel, pheasant, and small field mammals (mice and voles). The industrial area is inhabited by English sparrows, starlings, robins, mockingbirds, Norway rats, raccoons, and eastern cottontail rabbits.

g. *Cultural*:

There are properties listed on, or eligible for listing on, the *National Register of Historic Places* in the project impact area.

Description: The Holyoke Canal System, a contributing element in the Holyoke Canal Historic District, is listed on the *National Register of Historic Places* and is within the area of the project's potential environmental impact. The portion of the canal in the project area was constructed between 1854 and 1857.

h. *Visual quality*: The project is in an industrial area. Its appearance is consistent with that of the surrounding buildings and structures.

i. *Recreation*: The immediate project area receives no significant recreational use because of its location in a highly industrialized area. No recreational facilities are located at the project. Recreational facilities including playgrounds, swimming pools, and a skating rink are available for use within walking distance of the project. The Connecticut River in the project vicinity is used for boating and fishing.

j. *Land use*: The project is entirely within the city of Holyoke. Land in the project area is primarily used for commercial, industrial, and residential purposes. The canal system is used for generating hydroelectric power at several locations.

k. *Socioeconomics*: The socioeconomic well-being of the area is influenced by industrial and urban development.

G. *Environmental Issues and Proposed Resolutions*

There are 3 issues addressed below.

1. *Cumulative impacts on Atlantic salmon resulting from developing several hydropower projects in the Connecticut River Basin*: The Atlantic salmon is currently a primary target species for a major federal, state, and private sector restoration effort. The goal of the restoration program is to provide and to maintain a sport fishery for Atlantic salmon in the Connecticut River, and to restore and maintain a spawning population in selected tributaries (Federal Energy Regulatory Commission, 1986).

Seaward migrating salmon smolts in the river basin pass numerous hydropower developments where they may become entrained and impinged. The more hydropower facilities outmigrating fish have to pass, the greater the fish losses. Among these hydropower facilities are the Holyoke dam and the canal system.

When river discharges are high and water is flowing over the dam, migrating fish pass

[63,508]

downstream with little or no delay (Northeast Utilities Service Company, 1984). On the other hand, outmigrating fish would be entrained into the canal system by high flows entering the canal if they arrive at the dam when flashboards, permitting little or no spillage, are in place. Once in the canal, escape is very difficult. Fish can then be entrained in the turbines of hydropower plants operating along the canal.

On February 26, 1988, the Commission ordered the Holyoke Water Power Company (HWPC) to spill water over Holyoke dam when salmon smolts are migrating downstream (Federal Energy Regulatory Commission, 1988a). [HWPC is the licensee for the Hadley Falls Project (FERC Project No. 2004) and the entity that controls the dam and the water going into the canal.] Spilling water over the Holyoke dam allows migrating salmon smolts to pass safely downstream in the spill, instead of entering the canal system.

Canal users and the HWPC have since implemented an economic dispatch agreement, in which the HWPC passes all flow downstream at the Holyoke dam and sells the users electricity, instead of water, when salmon smolts are migrating downstream. Linweave participates in this agreement. This arrangement prevents flow from entering the canal and attracting outmigrating Atlantic salmon, and minimizes the number of outmigrating Atlantic salmon trapped in the canal, and the number of project-related impacts to fish in the river basin.

Continuing to operate the Albion Mill, A Wheel, Hydroelectric Project would not contribute to cumulative adverse impacts on Atlantic salmon.

2. *Authority to prescribe fish passage facilities*: The Department of the Interior states that fish passage facilities may be needed at the project in the future, and, by letter of May 24, 1989 they reserve the authority to prescribe such fish facilities. The Commission reserves authority to require the licensee to provide fishways, as may be prescribed by the Secretary of Interior pursuant to section 18 of the Federal Power Act, if the need arises in the future.

3. *Entraining fish in the intake structure*: The Massachusetts Division of Fisheries and Wildlife (DFW) recommended the trashracks at the intake structures have a bar spacing not greater than 1 inch to prevent the entrainment of fish. The project's intake opening includes trashracks with one-inch slot width spacing between bars. The bar spacing at the existing structure satisfies the DFW's recommendation.

H. *Environmental Impacts*

1. Assessment of impacts expected from the applicant's proposed project (P), with the applicant's proposed mitigation and any conditions set by a federal land management agency; the proposed project with any additional mitigation recommended by the staff (Ps); and any action alternative considered (A).

Assessment symbols indicate the following impact levels:

O = None;	1 = Minor;
2 = Moderate;	3 = Major;
A = Adverse;	B = Beneficial;
L = Long-term;	S = Short term.

Resource	Impact		
	P	Ps	A
a. Geology-Soils	0		
b. Streamflow	0		
c. Water quality:			
Temperature	0		
Dissolved oxygen	0		
Turbidity and sedimentation	0		
d. Fisheries:			
Anadromous	0		
Resident	0		
e. Vegetation	0		
f. Wildlife	0		
g. Cultural:			
Archeological	0		
Historical	0		
h. Visual quality	0		

i. Recreation	0
j. Land use	0
k. Socioeconomics	0

2. Recommended alternative (including proposed, required, and recommended mitigative measures):

Proposed project.

3. Reason(s) for selecting the preferred alternative.

The power generated at this project is produced without any known adverse environmental impacts.

I. Unavoidable Adverse Impacts of the Recommended Alternative

There are no known adverse impacts.

J. Conclusion

Finding of No Significant Impact. Approval of the recommended alternative [H(2)] would not constitute a major federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement (EIS) will not be prepared.

K. Literature Cited

Dadswell, M.J., B.D. Taubert, T.S. Squires, D. Marchette, and J.L. Buckley. 1984. Synopsis of biological data on shortnose sturgeon

[63,509]

(*Acipenser brevirostrum*) Lesueur 1818. National Oceanic and Atmospheric Administration Technical Report NMFS 14, National Oceanic and Atmospheric Administration, Washington, D.C., 45pp.

Linweave, Inc. 1988. Application for minor license for the Ablion Mill, A Wheel, Hydroelectric Project, FERC Project No. 2768, Massachusetts. November 25, 1988.

-----, 1989a. Supplement to the application for minor license for the Albion Mill, A Wheel, Hydroelectric Project, FERC Project No. 2768, Massachusetts. February 21, 1989.

-----, 1989b. Additional information for the application for minor license for the Albion Mill, A Wheel, Hydroelectric Project, FERC Project No. 2768, Massachusetts. March 20, 1989.

Northeast Utilities Service Company. 1984. Review of cancelled Atlantic salmon smolt (*Salmo salar*), radiotelemetry study at the Holyoke dam, Massachusetts. Hartford, Connecticut. September 1984.

Federal Energy Regulatory Commission. 1983. Planning status report for the Connecticut River Basin. Washington, DC. August 1983.

-----, 1986. Environmental assessment for the Connecticut River Basin. Washington, D.C. November 7, 1986.

-----, 1988a. Order amending license for the Hadley Falls Project, FERC Project No. 2004 [42 FERC 162,166], Massachusetts. February 26, 1988.

-----, 1988b. Environmental assessment for the Number 2 Hydro Unit, FERC Project No. 2387, Holyoke, Massachusetts. August 26, 1988.

Taubert, B.D. 1980. Biology of shortnose sturgeon (*Acipenser brevirostrum*) in the Holyoke Pool, Connecticut River, Massachusetts. Ph.D. Thesis. University of Massachusetts, Amherst, 136 pp.

L. List of Preparers (Name--Position title)

James T. Griffin--Archeologist (Coordinator)

Rainer Feller--Ecologist

Peter Leitzke--Geologist

Ann E. Mates--Environmental Protection Specialist

Mary Nowak--Editor

Marc Zimmerman--Ecologist

Safety and Design Assessment
Albion mill (A Wheel) Hydroelectric Project
FERC Project No. 2768-002 - MA

Dam Safety

The applicant for the Albion Mill (A Wheel) Project is Linweave, Inc., a manufacturer of paper products. No dam or spillway is included in the project works. All water is delivered to the project via the Holyoke Second Level Canal, which is owned and operated by the Holyoke Water Power Company (HWP).

The New York Regional Office (NYRO), in an Operation Inspection Report dated October 10, 1986, indicated that the existing project had no downstream hazard potential. Since there is no dam, the staff concludes that there are no dam safety problems.

Project Design

The existing project works would consist of: (1) a gated intake with submerged trashracks located on the Second Level Canal of the HWP; (2) a 130-foot-long, 8-foot-diameter steel penstock; (3) a single runner, Francis turbine directly coupled to a 312-kilowatt (kW) Westinghouse generator; (4) a 260-foot-long, 16-foot-wide by 9-foot-high arched, brick-lined tailrace tunnel; (5) a concrete gated outlet structure where the tailwater empties into a channel that leads to the Connecticut River; (6) a 0.6-kilovolt (kV), 650-foot-long transmission line, and a 13.8-kV, 90-foot-long transmission line; and (7) appurtenant facilities. The 240-foot-long by 320-foot-wide Albion Mill building which houses the generating equipment is not considered part of the project works.

The applicant has proposed no new construction or improvements for the existing project; therefore, the project license does not need to include any special engineering articles.

The NYRO October 1986 Operation Inspection Report cited no deficiencies in project safety or operation. There is no dam within the project boundaries.

The staff concludes that the project would be safe and adequate if operated in conformance with the terms of a new license.

Water Resource Planning

The project works would contain one 312-kW generator directly connected to a Francis turbine. The gross head at the site ranges from 24 to 32 feet depending upon the tailwater elevation and the average head is 30 feet. The design head of the turbine is 32 feet and its hydraulic capacity is estimated to be 181 cubic feet per second (cfs). The applicant indicated that the project generated 1,795

[63,510]

megawatthours (MWh) annually. The staff finds that the plant factor would be 65.7 percent. The project would continue to be operated manually in a run-of-river mode.

All water to the project is delivered via the Second Level Canal. The Second Level Canal is one of a series of three canals (First Level Canal, Second Level Canal, and Third Level Canal) that receives water from the Hadley Falls Project (FERC Project No. 2004) on the Connecticut River. The HWP owns and operates the Hadley Falls Project and its canal system, which delivers water to various manufacturing and other business concerns for process purposes and power generation. The applicant for the Albion Mill (A Wheel) Project is Linweave, Inc.

The water for power generation is allocated in the form of mill powers (mp) to owners of lands adjacent to the canal system, under indentures or contracts between the individual property owners and the HWP.

These "mp" quantities vary according to water flow in the Connecticut River and fall into the following three categories:

Permanent power - the amount of water sold to Linweave whenever the average daily river flows in the Connecticut River are equal to or greater than 3,100 cfs.

Surplus power - water offered for sale to owners of the so- called permanent power rights whenever average river flows in the Connecticut River are equal to or greater than 3,600 cfs.

Non-permanent power - water which is not guaranteed, but which would be furnished when there is more than a sufficient quantity of water in the river to supply all the permanent power owners together with 50 percent of it as surplus. Water would be supplied 6 days a week (but not on Sundays or holidays) when the river flows are equal to or greater than 3,865 cfs. Sunday and holiday operation is allowed when the average river flows exceed approximately 4,300 cfs.

Under the allocation terms of the indentures, Linweave is entitled, in perpetuity, to draw a carefully prescribed quantity of water from the HWP canal system for power generation and discharge it into the Connecticut River below the project. Linweave is also entitled to purchase and use such surplus water as the HWP makes available from time to time.

The Albion Mill (A Wheel) Project is authorized two types of water allocation rights based on the indentures: permanent and permanent plus 50 percent surplus. For permanent power allocations, the Albion Mill (A Wheel) Project is authorized to withdraw 5 mp or 143 cfs. For permanent plus 50 percent surplus power allocations, the project is authorized to withdraw 5.9 mp or 169 cfs. Based on the staff's flow duration curve for the Connecticut River, the applicant can withdraw 143 cfs about 90 percent of the time, and 169 cfs about 87 percent of the time. Whenever the flows in the Connecticut River exceed 15,000 cfs, the applicant can withdraw the maximum hydraulic capacity of the turbine unit, which is 181 cfs, from the Second Level Canal. The staff estimates that this could occur about 31 percent of the time.

The applicant has estimated that the project operates at its maximum capacity (181 cfs) about 26 percent of the time, at its permanent plus 50 percent surplus allocation (169 cfs) about 59 percent of the time, and at its permanent allocation (143 cfs) about 4 percent of the time. Based on the applicant's estimates, the project would be shut down 11 percent of the time. The NYRO 1986 Operation Inspection Report indicated that the canal system is shut down 3 times a year: once in April, once in July, and once in October. During those periods, the canal system is drained, inspected, and repaired if needed. The repairs are generally scheduled for the July shutdown.

There are certain periods of the year when the project cannot operate and the applicant is directed by the HWP to discontinue drawing water from the canal system. These periods include: (1) periods when the canal system is dewatered for inspection and maintenance; (2) periods of low flow in the Connecticut River when a public authority has required that the low flows be released at the Hadley Falls Project rather than through the canals according to the indentures, without generating power; and (3) periods when a public authority requires that the waters of the Connecticut River flow through the HWP's hydroelectric generating facilities at the Hadley Falls Project rather than through the canal system according to the indentures. During the latter periods when the HWP generates power at the Hadley Falls Project rather than releases water through the canal system, the applicant is entitled to compensation in kilowatthours (in lieu of water) under the terms of the Water Use Agreement (or Economic Dispatch Agreement). In 1987, the compensation provided under the Economic Dispatch Agreement amounted to 1,545 MWh for the eight projects owned by the applicant.

The staff's independent analysis shows that the applicant makes reasonable use of its allocated water. Because of the water allocation limits of the HWP, the applicant cannot develop additional potential at the site. Hence, the staff concludes that the applicant has properly

[63,511]

developed the head and hydraulic potential of the site.

The August 1983 Planning Status Report for the Connecticut River Basin lists 19 existing hydroelectric projects, including the Albion Mill (A Wheel) Project, which are located on the canal system owned by HWP. The applicant owns eight of these projects. The report also listed the Holyoke Project on the canal system as a potential project with an installed capacity of 1,222 kW and an annual generation of 13,165 MWh. The report did not indicate any proposed project on the canal system that would be in conflict with the Albion Mill (A Wheel) Project.

The staff's review of the state and federal agency comments and of seven comprehensive resource development plans identified no plans with which the existing project would be in conflict within this reach of the Second Level Canal. The staff presently has no specific comments or recommendations from reviewing agencies addressing flood control, navigation, or water supply requirements for the Second Level Canal. No competing applications for the project are currently pending before the Commission.

The City of Holyoke, Massachusetts Gas and Electric Department, and the HWP filed petitions to intervene in the licensing proceeding. Neither party opposes the issuance of a license but each wanted to protect its interests. The HWP submitted a series of technical comments correcting certain information in the application. None of the corrections affect this report.

The generation from this project is equivalent to generation produced from burning 3,200 barrels of oil or 730 tons of coal annually in a steam-electric plant.

In summary, the staff's analysis shows that the existing project is properly designed to develop the hydropower potential of the site.

Economic Evaluation

The proposed project would be economically beneficial, so long as the projected levelized cost is less than the levelized cost of alternative energy and capacity.

In the case of the Albion Mill (A Wheel) Project, the applicant has proposed no new construction. Hence, the levelized project costs would be the operation and maintenance costs and administrative and general costs. These costs are small compared to the value of the power.

The applicant currently sells the project power to Fitchburg Gas & Electric Light Company, pursuant to a power sales agreement dated March 25, 1982, and it would continue to do so.

The staff concludes that the existing project is economically beneficial.

Exhibits

The staff concludes that the following parts of exhibit A and the following exhibit F drawings conform to the Commission's rules and regulations. The staff therefore includes these in the license:

Exhibit A - The following sections of exhibit A filed November 25, 1988:

The turbine and generator description on page A-2; the transmission line description on page A-2, and corrected by letter dated April 10, 1989; and the additional mechanical and electrical equipment description on pages A-1 through A-7.

Exhibit	FERC No.	Showing
---------	----------	---------

F-1	2768-3	Site Plan
-----	--------	-----------

F-2	2768-4	Powerhouse Plan and Elevation
-----	--------	-------------------------------

Preparers

David E. Zehner, Civil Engineer

C. Frank Miller, Electrical Engineer

-- Footnotes --

[63,498]

Footnotes

1 See 33 FPC 593, 594 (1965).

[63,499]

- 2 Connecticut River 1982 Water Quality Management Plan, June 1983, Massachusetts Division of Water Pollution Control; Connecticut River Basin Fish Passage, Flow, and Habitat Alteration Considerations in Relation to Anadromous Fish Restoration, October 1981, Technical Committee for Fisheries Management of the Connecticut River; The Outdoor Heritage of Massachusetts, SCORP 1983-1988, December 1983, Massachusetts Department of Environmental Management; A Strategic Plan for the Restoration of Atlantic Salmon to the Connecticut River Basin, September 1982, Policy Committee for Fisheries Management of the Connecticut River.

[63,501]

- 3 *See Montana Power Company*, 56 FPC 2008 (1976).

[63,504]

- 1 Figures and attachments referenced in the text are omitted from this document due to reproduction requirements.

47 FERC ¶62,307, Linweave, Inc., Project No. 2766-002-Massachusetts, (Jun. 29, 1989)

<http://prod.resource.cch.com/resource/scion/document/default/%28%40%40FERC-FEG-02+47FERCP62307PAGE63574%29200996112845781DOC20226>

Linweave, Inc., Project No. 2766-002-Massachusetts

[63,574]

[¶62,307]

Linweave, Inc., Project No. 2766-002-Massachusetts

Issuing New License (Minor Project)

(Issued June 29, 1989)

Fred E. Springer, Director, Office of Hydropower Licensing.

Linweave, Inc. has filed a license application under Part I of the Federal Power Act (Act) to continue to operate and maintain the Albion Mill (D Wheel) Project, located on the Holyoke Canal, in Hampden County, Massachusetts. The hydroelectric facilities located along the Holyoke Canal system affect navigable waters of the United States.¹ The license for the project, which was issued on July 6, 1977 [59 FPC 395], with an effective date of March 1, 1941, expires on February 28, 1991. The existing license waived section 15 of the Act only as it relates to federal takeover.

Notice of the application has been published. No protests were filed in this proceeding, and no agency objected to issuance of this license.

[63,575]

Comments received from interested agencies and individuals have been fully considered in determining whether to issue this license. Motions to intervene were filed by the City of Holyoke Gas & Electric Department and the Holyoke Water Power Company (HWP) in order to be parties in this proceeding. HWP also requests that any license issued which utilizes HWP's Holyoke Canal System water be conditioned, as was the previous license, to require cooperation with HWP as the licensee for the Hadley Falls Project No. 2004. Article 202 is included to provide for appropriate cooperation.

Comprehensive Development

Sections 4(e) and 10(a)(1) of the Act require the Commission to consider and balance in the public interest all uses of the waterway on which a project is proposed to be located.

The Albion Mill (D Wheel) Project has operated under the terms of its existing license since 1977. In the environmental assessment (EA), the staff analyzed the environmental effects of the continued operation of the project. Neither the resource agencies nor staff identified any significant conflicts between continued operation of the project as proposed by the applicant, and the environmental values of the project area.

Three alternatives to relicensing the Albion Mill (D Wheel) Project were also considered by the staff in its EA. They include: (1) issuance of an annual license; (2) issuance of a non-power license; and (3) denial of a license application. No alternative was identified that would have a higher or better use of the project in terms of providing power and environmental benefits without significant environmental cost.

Section 10(a)(2) of the Act also requires the Commission to consider the extent to which a proposed project is consistent with an existing federal, state, or local comprehensive plan. Under section 10(a)(2), federal, and state agencies filed seven comprehensive plans that address resources in Massachusetts. Of these plans, staff identified and reviewed four plans relevant to this project.² No conflicts between the proposed Albion Mill (D Wheel) Project and these four plans were found.

Therefore, the project as conditioned is determined to be best adapted to a comprehensive plan, pursuant to section 10(a) of the Act, for improving a waterway and would provide for adequate protection, mitigation, and enhancement of fish and wildlife pursuant to section 10(j) of the Act.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the Act requires the Commission to include license conditions, based on recommendations of federal and state fish and wildlife agencies, for the protection, mitigation, and enhancement of fish and wildlife. The environmental assessment for the Albion Mill (D Wheel) Project addresses the concerns of the federal and state fish and wildlife agencies; however, recommendations are not needed for continued operation of the project.

ECPA Findings

Section 10(a)(2)(C) and section 15(a) of the Federal Power Act, as amended by the Electric Consumers Protection Act of 1986 (ECPA), requires the Commission to consider in writing the following factors in issuing new licenses.

The following discussions apply individually and collectively to the eight hydro projects owned and operated by Linweave, Inc. The eight projects are identified by FERC project numbers: 2497, 2758, 2766, 2768, 2770, 2771, 2772, and 2775.

Consumption Efficiency Improvement Programs (Section 10(a)(2)(C))

Since the applicant's primary business is the manufacture of paper products and not the generation or sale of electric power, no discussion of on-going or planned conservation and load-management programs is required in this document.

The Plans and Abilities of the Applicant to Comply with the Articles, Terms, and Conditions of Any License Issued to It and Other Applicable Provisions of Part I of the Act (Section 15(a)(2)(A))

The staff has reviewed the plans of the applicant to comply with the articles, terms, and conditions of any license issued to Linweave, Inc.

A review of the compliance record of the applicant indicates that the applicant's compliance with the terms and conditions of its current license has been satisfactory. The staff concludes that the applicant has demonstrated

[63,576]

its ability to comply in a good faith manner with all articles, terms, and conditions of the license, and the staff concludes that the applicant would perform in a competent manner if issued a new license for the project.

The Plans of the Applicant to Manage, Operate, and Maintain the Project Safely (Section 15(a)(2)(B))

The staff has reviewed the applicant's plans to manage, operate, and maintain the project safely. There is no dam within the project boundaries to operate and maintain.

The eight projects draw carefully prescribed quantities of water from the Second Level Canal and discharge it to the Connecticut River below the projects. There is a flood wall located between the eight projects and the Connecticut River that ensures protection during flood conditions. When the river elevations reach 62 feet or higher, the eight projects are shut down and the headgates and tailrace gates are closed. The City of Holyoke Department of Public Works (DPW) is responsible for implementing the flood wall operation schedule and closing the tailrace gates of the eight projects.

The applicant has operated the eight projects with a perfect employee safety and public safety record. There have been no deaths or lost-time injuries to employees from project operations, nor is there any record of injury or death to the public within the project boundaries.

Based upon a review of the available information on the project safety plans, the staff concludes that the applicant is capable of managing, operating, and maintaining the project in a safe manner.

The Plans and Abilities of the Applicant to Operate and Maintain the Project in a Manner Most Likely to Provide Efficient and Reliable Electric Service (Section 15(a)(2)(C))

The staff has reviewed the operation inspection reports by the NYRO and the applicant's project operation reports.

The applicant has full time employees in its engineering department that monitor the eight projects, including physically checking each unit several times daily. Additionally, the projects have automatic safety devices to shut down the units in case of abnormal operating conditions.

The applicant cleans the trashracks and lubricates the mechanical machinery regularly. The applicant provides for periodic inspection of the penstock and provides maintenance when needed.

The applicant has reported a total of seven unscheduled outages for the eight projects over the last five years. The outages ranged in length from 48 days to 114 days during which time the equipment was repaired. The applicant has rebuilt and/or overhauled seven of the generating units since February 1979 when the applicant purchased the eight projects.

The applicant has no plans to increase generation at the eight projects. The main reason for this is that the applicant is entitled to withdraw only a carefully prescribed quantity of water from the Second Level Canal under the terms of certain indenture agreements with HWP.

The applicant is in the paper-products manufacturing business, which is a highly competitive field and is very energy-intensive. Because of the competition in the paper-products market, the applicant must operate the project in the most efficient and reliable manner to maximize electric power sales revenues available to offset power purchases for use in its paper-manufacturing operations.

The staff concludes that the project is being operated in an efficient and reliable manner.

The Need of the Applicant Over the Short and Long Terms for the Electricity Produced by the Project to Serve Its Customers(Section 15(a)(2)(D))

The applicant, Linweave, Inc., is a manufacturer of paper products and, as such, does not sell any of the electrical output of the eight hydroelectric projects (which it owns and operates as the current licensee) to end-use customers. Therefore, this document does not address the applicant's need for the electricity generated by the eight projects to serve its customers. The paper-products manufacturing business is today a highly competitive industry. Production costs in this industry are very energy-intensive, due to the large amounts of electric energy used for the manufacture of paper. When deprived of a low-cost source (or sources) of electric energy, a paper manufacturer cannot survive in the market place for paper products.

All eight of the hydropower projects for which the applicant is applying for new licenses are operated in the run-of-the river mode; and, as a result, the capacity and energy produced by them depend upon the available streamflow provided by the Second Level Canal of the Holyoke Water Power Company (HWP). This flow is subject to seasonal and yearly variations. The applicant's electric power demands at the several paper mills are determined by factors which are in no way correlated with water flow in the canal system. Because of this, and for other reasons affecting the applicant's paper-making electrical energy costs, Linweave has found it to be economically

[63,577]

advantageous to sell the output of the eight projects to a local electric utility and purchase the power required by the Linweave paper mills.

The total net electrical output from all eight of the projects is currently being sold, and is expected to continue to be sold to Fitchburg Gas and Electric Light Company (FGELC), pursuant to a power sales agreement dated March 25, 1982.

The applicant's present and future need for the electric power produced by the eight hydro projects, with which this document is concerned, can be stated in few words: revenues received from the sale of project capacity and energy are used to offset the cost of capacity and energy purchased on an "as-needed," "total requirements" purchase agreement with a local utility, thus improving Linweave's competitive position in the paper-products marketplace, which may prove necessary for industrial survival.

The total installed capacity of the eight hydro projects is 3.362 megawatts (MW), and the applicant estimates that the projects are capable of producing an average of 16,997 megawatthours (MWh) of energy annually.

The staff concludes that there is a need for the project power over the short and the long term.

The Existing and Planned Transmission Services of the Applicant(Section 15(a)(2)(E))

If the applicant is issued new licenses for the eight hydro projects listed above, no changes of the existing transmission system, its operation, or operating characteristics would occur as a result thereof, and none are planned.

If new licenses are denied, the transmission system, or systems associated with the eight projects, would no longer be required, since the applicant would no longer generate power to sell. The applicant would continue to purchase "all requirements" power required for the operation of the paper mills from a local utility. Transmission would not be affected by denial of the licenses.

The staff concludes that the transmission services are adequate as they currently exist.

Whether the Plans of the Applicant will be Achieved, to the Greatest Extent Possible, in a Cost Effective Manner (Section 15(a)(2)(F))

The Albion Mill was constructed in 1877 and the present hydroelectric generating unit was installed in 1954 and rebuilt in 1983. No new construction is proposed. The annual cost of operating the project would be its annual operation and maintenance costs. Continued future project operation would serve to provide an economically efficient source of energy for Linweave, Inc. The staff concludes that the project is economically beneficial.

The Applicant's Record of Compliance with the Terms and Conditions of the Existing License (Section 15(a)(3))

The compliance records of Linweave, Inc., with the terms and conditions of its existing licenses, are satisfactory. Further, the licensee has maintained the projects in a satisfactory manner.

The licensee is reminded that failure to comply with the terms and conditions of this license will subject it to the enforcement and penalty provisions of section 31 of the Federal Power Act.

Term of License

Section 15 of the Act, as amended by ECPA specifies that any license issued under section 15 shall be for a term which the Commission determines to be in the public interest, but not less than 30 years, nor more than 50 years from the date the license is issued. This provision is similar to pre-ECPA Commission policy, which was to establish from the expiration date of the existing license, 30-year terms for those projects which proposed no new construction or capacity, 40-year terms for those projects that proposed a moderate amount of new development, and 50-year terms for those projects that proposed a substantial amount of new development.³

Linweave, Inc. proposes no modifications to the existing project facilities or change in operation of the project. However, the existing license will not expire until February 28, 1991. Accordingly, the new license for the project will be for a term of 30 years from the expiration of the existing license.

Summary of Findings

An EA was issued for this project. Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the EA attached to this order. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if operated and maintained in accordance with the requirements

[63,578]

of this license. Analysis of related issues is provided in the Safety and Design Assessment attached to this order.

The Director, Office of Hydropower Licensing, concludes that the project would not conflict with any planned or authorized development, and would be best adapted to comprehensive development of the waterway for beneficial public uses.

The Director orders:

(A) This license is issued to Linweave, Inc. (licensee), for a period of 30 years, effective March 1, 1991, to operate and maintain the Albion Mill (D Wheel) Project. This license is subject to the terms and conditions

of the Act, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, shown by exhibit G:

Exhibit G- FERC No. Showing

1 2766-5 Project Location

(2) Project works consisting of: (a) a gated intake with submerged trashracks located on the second level canal; (b) a 190-foot-long, 9-foot-diameter steel penstock; (c) a single runner, Francis turbine directly coupled to a 500-kilowatt (kW) Westinghouse generator; (d) a 205-foot-long, 9-foot-wide by 12-foot-high arched, brick-lined tailrace tunnel; (e) a concrete gated outlet structure where the tailwater empties into a channel that leads to the Connecticut River; (f) a 0.6-kilovolt (kV), 605-foot-long transmission line, and a 13.8-kV, 90-foot-long transmission line and (g) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of exhibits A and F recommended for approval in the attached Safety and Design Assessment.

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project, all portable property that may be employed in connection with the project and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The exhibit G described above and those sections of exhibits A and F recommended for approval in the attached Safety and Design Assessment are approved and made part of the license.

(D) The following sections of the Act are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates to public notice and to the acceptance and expression in the license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15; 16; 19; 20; and 22.

(E) This license is subject to the articles set forth in Form L-9 [54 FPC 1852], (October 1975), entitled "Terms and Conditions of License for Constructed Minor Project Affecting Navigable Waters of the United States," and the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective March 1, 1991:

For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 667 horsepower.

Article 202. The Licensee shall cooperate with the licensee for Project No. 2004 in order that the conditions of Article 16 of the license for Project No. 2004 can be fulfilled.

Article 401. Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or provide for the construction, operation, and maintenance of such fishways, as may be prescribed by the Secretary of the Interior pursuant to section 18 of the Federal Power Act.

Article 402. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of

[63,579]

this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

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

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

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

federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an

[63,580]

application for prior approval, the licensee may convey the intended interest at the end of that period.

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

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

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

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

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

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

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(G) This order is issued under authority delegated to the Director and is final unless appealed to the Commission by any party within 30 days from the issuance date of this order. Filing an appeal does not stay the effective date of this order or any date specified in this order. The licensee's failure to appeal this order shall constitute acceptance of the license.

Environmental Assessment¹

Federal Energy Regulatory Commission

Office of Hydropower Licensing

Division of Project Review

Date: June 16, 1989

Project name: Albion Mill, D Wheel, Hydroelectric Project

FERC Project No. 2766 - 002

A. Application

1. Application type: New minor license
2. Date filed with the Commission: November 25, 1988
3. Applicant: Linweave, Inc.
4. Water body: Holyoke Canal River basin: Connecticut
5. Nearest city or town: Holyoke (See figure 1.)
6. County: Hampden State: Massachusetts

B. Purpose and Need for Action

1. Purpose.

Linweave estimates the average annual energy generation of the Albion Mill, D Wheel, Hydroelectric Project is 2,382 megawatthours. Project power is sold to the Fitchburg Gas and Electric Light Company.

2. Need for power.

The power from the project is useful in meeting a small part of the need for power projected for the New England Power Pool area of the Northeast Power Coordinating Council (NPCC) region. Power generated at the project displaces fossil-fueled power generation in the

[63,581]

NPCC region, thus conserving nonrenewable fossil fuels and reducing the emission of noxious by-products caused by the combustion of fossil fuels.

C. Proposed Project and Alternatives

1. Description of the proposed action. (See figure 2.)

The existing operating project was issued an initial license in 1977, which will expire in 1991. The licensee has filed for a new license for the continued operation of the project. The existing project consists of: (i) a gated intake with submerged trashracks located on the second level canal of the Holyoke Water Power Company; (ii) a 9-foot-diameter penstock, 190 feet long; (iii) an existing 500-kW generating unit located within the Gill Mill building; (iv) a 9-foot-wide by 12-foot-high arched brick-lined tailrace tunnel 205 feet long extending from the draft tube to an existing concrete outlet structure; (v) a concrete gated outlet structure where tailwater empties into a channel that leads to the Connecticut River; (vi) a 13.8-kV transmission line 475 feet long that connects the project to an existing transmission line; and (vii) appurtenant facilities. The project operates in a run-of-river mode. Linweave does not propose any construction or change in project operation. The Holyoke Water Power Company controls flows from the Connecticut River into the canal system under a FERC major license granted to Project No. 2004.

2. Applicant's proposed mitigative measures.

Since Linweave proposes to continue operating the project as in the past, with no new construction, no changes to the hydroelectric project, and no changes in the use and release of water, Linweave proposes no mitigative measures.

3. Federal lands affected.

No.

4. Alternatives to the proposed project.

a. *Issuance of an annual license.* Section 15(a) of the Federal Power Act (Act), [16 U.S.C. §808](#) (a), provides for the issuance of annual licenses to the prior licensee if the license expires pending the relicensing determination. Under this alternative, an annual license would continue to be issued to Linweave until a new license is issued. The annual license contains the same terms as the expired license, thereby maintaining the status quo.

b. *Issuance of a nonpower license.* Section 15(f) of the Act, §808(b), authorizes the Commission to issue a license for nonpower use when the Commission "finds that in conformity with a comprehensive plan for improving or developing a waterway or waterways for beneficial public uses all or part of any licensed project should no longer be used or adapted for use for power purposes." A license that is granted by the Commission for nonpower use is temporary. When the Commission finds that a state, municipality, interstate agency, or another federal agency is authorized and willing to assume regulatory supervision of the lands and facilities included under the nonpower license and does so, the Commission shall thereupon terminate the nonpower license.

c. *Denial of the license application.* Denial of the license application could lead to removal of the power facilities and removal of all project works.

D. Consultation and Compliance

1. Fish and wildlife agency consultation (Fish & Wildlife Coordination Act).

a. U.S. Fish & Wildlife Service: Yes.

b. State(s): Yes.

c. National Marine Fisheries Service: Yes.

2. Section 7 consultation (Endangered Species Act).

a. Listed species: Present.

b. Consultation: Not required.

Remarks: The federally listed endangered shortnose sturgeon under the jurisdiction of the National Marine Fisheries Service (NMFS) inhabits the lower segment of the Connecticut River from the river's mouth upstream to the Holyoke dam. A small landlocked population is found in the pool above the Holyoke dam (Taubert, 1980). Dadswell *et al.* (1984) estimated that between 800 and 1000 shortnose sturgeon inhabit the lower portion (below Holyoke) of the Connecticut River. The NMFS reports that due to the trashrack spacing, any sturgeon which might enter the canal would be prevented from entrainment into the project (personal communication, Chris Mantzaris, staff, National Marine Fisheries Service, Gloucester, Massachusetts, June 13, 1989).

3. Section 401 certification (Clean Water Act).

Required; applicant requested certification on 10/17/88.

Status: Granted by the certifying agency on 03/30/89.

4. Cultural resource consultation (Historic Preservation Act).

a. State Historic Preservation Officer: Yes.

b. National Park Service: Yes.

c. *National Register* status: Eligible or listed.

d. Council: Not required.

e. Further consultation: Not required.

Remarks: The project is adjacent to the Holyoke Canal System, a property listed in the

[63,582]

National Register of Historic Places. Since there would be no redevelopment, new construction, or changes to the exterior of the property, the project would not affect the canal system or any other *National Register* or eligible properties. The SHPO concurs with this finding (letter from Valerie A. Talmage, Executive Director, Massachusetts Historical Commission, and State Historic Preservation Officer, Boston, Massachusetts, December 9, 1988).

5. Recreational consultation (Federal Power Act).

a. U.S. Owners: No.

b. National Park Service: Yes.

c. State(s): Yes.

6. Wild and scenic rivers (Wild and Scenic Rivers Act).

Status: None.

7. Land and Water Conservation Fund lands and facilities (Land and Water Conservation Fund Act).

Status: None.

E. Comments

1. The following agencies and entities provided comments on the application or filed a motion to intervene in response to the public notice dated 03/27/89.

Commenting agencies
Date of letter
and other entities

Department of the Army,

New England Division

Corps of Engineers 05/11/89

Environmental Protection

Agency 05/17/89

Department of the Interior 05/19/89

Massachusetts Division of

Fisheries and Wildlife 05/30/89

Motions to intervene
Date of motion

City of Holyoke, Gas and

Electric Department 03/28/89

Holyoke Water Power Company 05/24/89

2. The applicant did not respond to the comments or motion(s) to intervene.

F. Affected Environment

1. General description of the locale. (See figure 3.)

a. Description of the Connecticut River Basin.

The Connecticut River Basin, with a drainage area of 11,765 square miles, is the largest river basin in New England. Extending from the northernmost part of New Hampshire to Long Island Sound, the river basin has a maximum length in a north-south direction of about 280 miles and a maximum width of about 62 miles. The total drainage area of the basin is 11,765 square miles. The principal tributaries to the mainstem Connecticut River, by state, are the Passumpsic, White, West, Ottauquechee, and Black Rivers in Vermont; the Ammonoosuc, Mascoma, Ashuelot, and Sugar Rivers in New Hampshire; the Millers, Deerfield, Chicopee, and Westfield Rivers in Massachusetts; and the Farmington River in Connecticut.

This complex of rivers and tributaries constitutes one of the most extensively developed hydropower systems in the U.S. There is now a major effort by federal, state, and private sectors to restore Atlantic salmon to the Connecticut River Basin.

The project is located in a heavily industrialized setting between the second level of the Holyoke Canal system and the Connecticut River. The climate is typical of inland Connecticut and Massachusetts with an average temperature of 49.8 degrees Fahrenheit and an average annual precipitation of 44.39 inches.

b. Licensed and exempted projects.

There are 62 existing licensed projects and 38 exempted projects in the Connecticut River Basin, as of June 1, 1989.

c. Pending applications.

There are 10 pending license applications in the Connecticut River Basin, as of June 1, 1989.

d. Cumulative impacts.

Cumulative impacts are defined as impacts on the environment that result from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions regardless which agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 C.F.R., Part 1508.7).

A target resource is an important resource that may be cumulatively affected by multiple development within a basin. The staff identified Atlantic salmon as the target resource in the Connecticut River Basin (Federal Energy Regulatory Commission, 1986). The selection was based on the regional significance and geographic distribution of this species within the river basin. This anadromous fishery resource is described below in section F(2d). Impacts to Atlantic salmon are discussed in section G.

2. Descriptions of the resources in the project impact area (Source: Linweave, Inc., application, exhibit E, unless otherwise indicated).

[63,583]

a. *Geology and soils*: Bedrock in the project area is interbedded sandstone, shale, conglomerate, and basaltic lava. The glacial till deposits that lie on the glaciated surface of the bedrock are overlain by varied glacial lake deposits. The original dry, sandy, surface soils in the project area have been highly altered by construction of the project and by fill and construction activities associated with urban development of the area.

b. *Streamflow*: Water flow in the canal system is controlled at the canal gatehouse in order to supply necessary water to various hydropower and industrial facilities along the canal. The amount of flow entering the canal system ranges from no flow, when the gatehouse is shut down, to 5,155 cubic feet per second, which is the maximum hydraulic capacity of the canal.

c. *Water quality*: The Connecticut River upstream of Holyoke dam is classified as Class B water by the Massachusetts Division of Water Pollution. Class B water is suitable for primary and secondary contact recreation and fish and wildlife resources. Class B water must have dissolved oxygen (DO) levels greater than 5.0 milligrams per liter (mg/l) and a pH between 6.5 and 8.0. The first level canal is classified as Class C. Class C water is suitable for secondary contact recreation and fish and wildlife resources and must have a DO level greater than 5.0 mg/l and a pH between 6.5 and 9.0 standard units. Water in the project area conforms to the state water quality standards.

d. *Fisheries*:

Anadromous: Present.

Anadromous fish species found in the Connecticut River in the vicinity of the project include American shad, Atlantic salmon, blueback herring, sea lamprey, striped bass, shortnose sturgeon, and American eel (catadromous).

Resident: Present.

Resident fish species found in the Connecticut River in the vicinity of the project include carp, channel catfish, smallmouth bass, largemouth bass, spottail shiner, white perch, bluegill, rainbow trout, and brown trout.

e. *Vegetation*: Dominant vegetative species in the vicinity of the project include oak, maple, white pine, pitch pine, grasses, and ornamental shrubs.

f. *Wildlife*: Undeveloped land in the project area provides habitat for the gray squirrel, eastern cottontail rabbit, raccoon, muskrat, beaver, weasel, pheasant, and small field mammals (mice and voles). The industrial area is inhabited by English sparrows, starlings, robins, mockingbirds, Norway rats, raccoons, and eastern cottontail rabbits.

g. *Cultural*: There are properties listed on, or eligible for listing on, the *National Register of Historic Places* in the project impact area.

Description: The Holyoke Canal System, a contributing element in the Holyoke Canal Historic District, is listed on the *National Register of Historic Places* and is within the area of the project's potential environmental impact. The portion of the canal in the project area was constructed between 1854 and 1857.

h. *Visual quality*: The project is in an industrial area. Its appearance is consistent with that of the surrounding buildings and structures.

i. *Recreation*: The immediate project area receives no significant recreational use because of its location in a highly industrialized area. No recreational facilities are located at the project. Recreational facilities including playgrounds, swimming pools, and a skating rink are available for use within walking distance of the project. The Connecticut River in the project vicinity is used for boating and fishing.

j. *Land use*: The project is entirely within the city of Holyoke. Land in the project area is primarily used for commercial, industrial, and residential purposes. The canal system is used for generating hydroelectric power at several locations.

k. *Socioeconomics*: The socioeconomic well-being of the area is influenced by industrial and urban development.

G. *Environmental Issues and Proposed Resolutions*

There are 3 issues addressed below.

1. *Cumulative impacts on Atlantic salmon resulting from developing several hydropower projects in the Connecticut River Basin*: The Atlantic salmon is currently a primary target species for a major federal, state, and private sector restoration effort. The goal of the restoration program is to provide and to maintain a sport fishery for Atlantic salmon in the Connecticut River, and to restore and maintain a spawning population in selected tributaries (Federal Energy Regulatory Commission, 1986).

Seaward migrating salmon smolts in the river basin pass numerous hydropower developments where they may become entrained and impinged. The more hydropower facilities outmigrating fish have to pass, the greater the fish losses. Among these hydropower facilities are the Holyoke dam and the canal system.

When river discharges are high and water is flowing over the dam, migrating fish pass downstream with little or no delay (Northeast

[63,584]

Utilities Service Company, 1984). On the other hand, outmigrating fish would be entrained into the canal system by high flows entering the canal if they arrive at the dam when flashboards, permitting little or no spillage, are in place. Once in the canal, escape is very difficult. Fish can then be entrained in the turbines of hydropower plants operating along the canal.

On February 26, 1988, the Commission ordered the Holyoke Water Power Company (HWPC) to spill water over Holyoke dam when salmon smolts are migrating downstream (Federal Energy Regulatory Commission, 1988a). [HWPC is the licensee for the Hadley Falls Project (FERC Project No. 2004) and the entity that controls the dam and the water going into the canal.] Spilling water over the Holyoke dam allows migrating salmon smolts to pass safely downstream in the spill, instead of entering the canal system.

Canal users and the HWPC have since implemented an economic dispatch agreement, in which the HWPC passes all flow downstream at the Holyoke dam and sells the users electricity, instead of water, when salmon smolts are migrating downstream. Linweave participates in this agreement. This arrangement prevents flow from entering the canal and attracting outmigrating Atlantic salmon, and minimizes the number of outmigrating Atlantic salmon trapped in the canal and the number of project-related impacts to fish in the river basin.

Continuing to operate the Albion Mill, D Wheel, Hydroelectric Project would not contribute to cumulative adverse impacts on Atlantic salmon.

2. *Authority to prescribe fish passage facilities*: The Department of the Interior states that fish passage facilities may be needed at the project in the future, and, by letter of May 24, 1989 they reserve the authority to prescribe such fish facilities. The Commission reserves authority to require the licensee to provide fishways, as may be prescribed by the Secretary of Interior pursuant to Section 18 of the Federal Power Act, if the need arises in the future.

3. *Entraining fish in the intake structure*: The Massachusetts Division of Fisheries and Wildlife (DFW) recommended the trashracks at the intake structures have a bar spacing not greater than 1 inch to prevent the entrainment of fish. The project's intake opening includes trashracks with one-inch slot width spacing between bars. The bar spacing at the existing structure satisfies the DFW's recommendation.

H. *Environmental Impacts*

1. Assessment of impacts expected from the applicant's proposed project (P), with the applicant's proposed mitigation and any conditions set by a federal land management agency; the proposed project with any additional mitigation recommended by the staff (Ps); and any action alternative considered (A).

Assessment symbols indicate the following impact levels:

O = None;	1 = Minor;
2 = Moderate;	3 = Major;
A = Adverse;	B = Beneficial;
L = Long-term;	S = Short-term.

Resource	Impact		
	P	Ps	A
a. Geology-Soils	0		
b. Streamflow	0		
c. Water quality:			
Temperature	0		
Dissolved oxygen	0		
Turbidity and sedimentation	0		
d. Fisheries:			
Anadromous	0		
Resident	0		
e. Vegetation	0		
f. Wildlife	0		
g. Cultural:			
Archeological	0		

Historical	0
h. Visual quality	0
i. Recreation	0
j. Land use	0
k. Socioeconomics	0

2. Recommended alternative (including proposed, required, and recommended mitigative measures):

Proposed project.

3. Reason(s) for selecting the preferred alternative.

The power generated at this project is produced without any known adverse environmental impacts.

I. Unavoidable Adverse Impacts of the Recommended Alternative

There are no known adverse impacts.

J. Conclusion

Finding of No Significant Impact. Approval of the recommended alternative [H(2)] would not constitute a major federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement (EIS) will not be prepared.

K. Literature Cited

Dadswell, M.J., B.D. Taubert, T.S. Squires, D. Marchette, and J.L. Buckley. 1984. Synopsis of biological data on shortnose sturgeon

[63,585]

(*Acipenser brevirostrum*) Lesueur 1818. National Oceanic and Atmospheric Administration Technical Report NMFS 14, National Oceanic and Atmospheric Administration, Washington, D.C., 45 pp.

Linweave, Inc. 1988. Application for minor license for the Albion Mill, D Wheel, Hydroelectric Project, FERC Project No. 2766, Massachusetts. November 25, 1988.

----- 1989a. Supplement to the application for minor license for the Albion Mill, D Wheel, Hydroelectric Project, FERC Project No. 2766, Massachusetts. February 21, 1989.

----- 1989b. Additional information for the application for minor license for the Albion Mill, D Wheel, Hydroelectric Project, FERC Project No. 2497, Massachusetts. March 20, 1989.

Northeast Utilities Service Company. 1984. Review of cancelled Atlantic salmon smolt (*Salmo salar*), radiotelemetry study at the Holyoke dam, Massachusetts. Hartford, Connecticut. September 1984.

Federal Energy Regulatory Commission. 1983. Planning status report for the Connecticut River Basin. Washington, DC. August 1983.

----- 1986. Environmental assessment for the Connecticut River Basin. Washington, D.C. November 7, 1986.

----- 1988a. Order amending license for the Hadley Falls Project, FERC Project No. 2004 [42 FERC ¶62,166], Massachusetts. February 26, 1988.

----- 1988b. Environmental assessment for the Number 2 Hydro Unit, FERC Project No. 2387, Holyoke, Massachusetts. August 26, 1988.

Taubert, B.D. 1980. Biology of shortnose sturgeon (*Acipenser brevirostrum*) in the Holyoke Pool, Connecticut River, Massachusetts. Ph.D. Thesis. University of Massachusetts, Amherst, 136 pp.

L. List of Preparers (Name--Position title)

James T. Griffin--Archeologist (Coordinator)
Rainer Feller--Ecologist
Peter Leitzke--Geologist
Ann E. Mates--Environmental Protection Specialist
Mary Nowak--Editor
Marc Zimmerman--Ecologist

Safety and Design Assessment
Albion Mill (D Wheel) Hydroelectric Project
FERC Project No. 2766-002-MA

Dam Safety

The applicant for the Albion Mill (D Wheel) Project is Linweave, Inc., a manufacturer of paper products. No dam or spillway is included in the project works. All water is delivered to the project via the Holyoke Second Level Canal, which is owned and operated by the Holyoke Water Power Company (HWP).

The New York Regional Office (NYRO), in an Operation Inspection Report dated October 10, 1986, indicated that the existing project had no downstream hazard potential. Since there is no dam, the staff concludes that there are no dam safety problems.

Project Design

The existing project works would consist of: (1) a gated intake with submerged trashracks located on the Second Level Canal of the HWP; (2) a 190-foot-long, 9-foot-diameter steel penstock; (3) a single runner, Francis turbine directly coupled to a 500-kilowatt (kW) Westinghouse generator; (4) a 205-foot-long, 9-foot-wide by 12-foot-high arched, brick-lined tailrace tunnel; (5) a concrete gated outlet structure where the tailwater empties into a channel that leads to the Connecticut River; (6) a 0.6-kilovolt (kV), 605-foot-long transmission line, and a 13.8-kV, 90-foot-long transmission line; and (7) appurtenant facilities. The 240-foot-long by 320-foot-wide Albion Mill building which houses the generating equipment is not considered part of the project works.

The applicant has proposed no new construction or improvements for the existing project; therefore, the project license does not need to include any special engineering articles.

The NYRO October 1986 Operation Inspection Report cited no deficiencies in project safety or operation. There is no dam within the project boundaries.

The staff concludes that the project would be safe and adequate if operated in conformance with the terms of a new license.

Water Resource Planning

The project works would contain one 500-kW generator directly connected to a Francis turbine. The gross head at the site ranges from 24 to 32 feet depending upon the tailwater elevation and the average head is 30 feet. The design head of the turbine is 32 feet and its hydraulic capacity is estimated to be 245 cubic feet per second (cfs). The applicant indicated that the project generated 2,382 megawatthours (MWh) annually. The staff finds that the plant factor would be 54.4 percent. The project would continue to be operated manually in a run-of-river mode.

All water to the project is delivered via the Second Level Canal. The Second Level Canal is one of a series of three canals (First Level Canal, Second Level Canal, and Third Level

[63,586]

Canal) that receives water from the Hadley Falls Project (FERC Project No. 2004) on the Connecticut River. The HWP owns and operates the Hadley Falls Project and its canal system, which delivers water to various manufacturing and other business concerns for process purposes and power generation. The applicant for the Albion Mill (D Wheel) Project is Linweave, Inc.

The water for power generation is allocated in the form of mill powers (mp) to owners of lands adjacent to the canal system, under indentures or contracts between the individual property owners and the HWP.

These "mp" quantities vary according to water flow in the Connecticut River and fall into the following three categories:

Permanent power - the amount of water sold to Linweave whenever the average daily river flows in the Connecticut River are equal to or greater than 3,100 cfs.

Surplus power - water offered for sale to owners of the so-called permanent power rights whenever average river flows in the Connecticut River are equal to or greater than 3,600 cfs.

Non-permanent power - water which is not guaranteed, but which would be furnished when there is more than a sufficient quantity of water in the river to supply all the permanent power owners together with 50 percent of it as surplus. Water would be supplied 6 days a week (but not on Sundays or holidays) when the river flows are equal to or greater than 3,865 cfs. Sunday and holiday operation is allowed when the average river flows exceed approximately 4,300 cfs.

Under the allocation terms of the indentures, Linweave is entitled, in perpetuity, to draw a carefully prescribed quantity of water from the HWP canal system for power generation and discharge it into the Connecticut River below the project. Linweave is also entitled to purchase and use such surplus water as the HWP makes available from time to time.

The Albion Mill (D Wheel) Project is authorized two types of water allocation rights based on the indentures: permanent and permanent plus 50 percent surplus. For permanent power allocations, the Albion Mill (D Wheel) Project is authorized to withdraw 7 mp or 202 cfs. For permanent plus 50 percent surplus power allocations, the project is authorized to withdraw 8.5 mp or 245 cfs. Based on the staff's flow duration curve for the Connecticut River, the applicant can withdraw 202 cfs about 90 percent of the time, and 245 cfs about 87 percent of the time. Whenever the flows in the Connecticut River exceed 15,000 cfs, the applicant can withdraw the maximum hydraulic capacity of the turbine unit, which is 245 cfs, from the Second Level Canal. The staff estimates that this could occur about 31 percent of the time.

The applicant has estimated that the project operates at its permanent plus 50 percent allocation (245 cfs), which is also its maximum capacity, about 85 percent of the time, and at its permanent allocation (202 cfs) about 4 percent of the time. Based on the applicant's estimates, the project would be shut down 11 percent of the time. The NYRO 1986 Operation Inspection Report indicated that the canal system is shut down 3 times a year: once in April, once in July, and once in October. During those periods, the canal system is drained, inspected, and repaired if needed. The repairs are generally scheduled for the July shutdown.

There are certain periods of the year when the project cannot operate and the applicant is directed by the HWP to discontinue drawing water from the canal system. These periods include: (1) periods when the canal system is dewatered for inspection and maintenance; (2) periods of low flow in the Connecticut River when a public authority has required that the low flows be released at the Hadley Falls Project rather than through the canals according to the indentures, without generating power; and (3) periods when a public authority requires that the waters of the Connecticut River flow through the HWP's hydroelectric generating facilities at the Hadley Falls Project rather than through the canal system according to the indentures. During the latter periods when the HWP generates power at the Hadley Falls Project rather than releases water through the canal system, the applicant is entitled to compensation in kilowatthours (in lieu of water) under the terms of the Water Use Agreement (or Economic Dispatch Agreement). In 1987, the compensation provided under the Economic Dispatch Agreement amounted to 1,545 MWh for the eight projects owned by the applicant.

The staff's independent analysis shows that the applicant makes reasonable use of its allocated water. Because of the water allocation limits of the HWP, the applicant cannot develop additional potential at the site. Hence, the staff concludes that the applicant has properly developed the head and hydraulic potential of the site.

The August 1983 Planning Status Report for the Connecticut River Basin lists 19 existing hydroelectric projects, including the Albion Mill (D Wheel) Project, which are located on the canal system owned by HWP. The applicant owns eight of these projects. The report also listed the Holyoke Project on the canal system as a potential project with an installed

[63,587]

capacity of 1,222 kW and an annual generation of 13,165 MWh. The report did not indicate any proposed project on the canal system that would be in conflict with the Albion Mill (D Wheel) Project.

The staff's review of the state and federal agency comments and of seven comprehensive resource development plans identified no plans with which the existing project would be in conflict within this reach of the Second Level Canal. The staff presently has no specific comments or recommendations from reviewing agencies addressing flood control, navigation, or water supply requirements for the Second Level Canal. No competing applications for the project are currently pending before the Commission.

The City of Holyoke, Massachusetts Gas and Electric Department, and the HWP filed petitions to intervene in the licensing proceeding. Neither party opposes the issuance of a license but each wanted to protect its interests. The HWP submitted a series of technical comments correcting certain information in the application. None of the corrections affect this report.

The generation from this project is equivalent to generation produced from burning 4,300 barrels of oil or 980 tons of coal annually in a steam-electric plant.

In summary, the staff's analysis shows that the existing project is properly designed to develop the hydropower potential of the site.

Economic Evaluation

The proposed project would be economically beneficial, so long as the projected levelized cost is less than the levelized cost of alternative energy and capacity.

In the case of the Albion Mill (D Wheel) Project, the applicant has proposed no new construction. Hence, the levelized project costs would be the operation and maintenance costs and administrative and general costs. These costs are small compared to the value of the power.

The applicant currently sells the project power to Fitchburg Gas & Electric Light Company, pursuant to a power sales agreement dated March 25, 1982 and it would continue to do so.

The staff concludes that the existing project is economically beneficial.

Exhibits

The staff concludes that the following parts of exhibit A and the following exhibit F drawings conform to the Commission's rules and regulations. The staff therefore includes these in the license:

Exhibit A - The following sections of exhibit A filed November 25, 1988:

The turbine and generator description on page A-2; the transmission line description on page A-2 and corrected by letter dated April 10, 1989; and the additional mechanical and electrical equipment description on pages A-1 through A-7.

Exhibit FERC No. Showing

F-1 2766-3 Site Plan

F-2 2766-4 Powerhouse Plan and

Elevation

Preparers

David E. Zehner, Civil Engineer

C. Frank Miller, Electrical Engineer

-- Footnotes --

[63,574]

Footnotes

1 See 33 FPC 593, 594 (1965).

[63,575]

2 Connecticut River 1982 Water Quality Management Plan, June 1983, Massachusetts Division of Water Pollution Control; Connecticut River Basin Fish Passage, Flow, and Habitat Alteration Considerations in Relation to Anadromous Fish Restoration, October 1981, Technical Committee for Fisheries Management of the Connecticut River; The Outdoor Heritage of Massachusetts, SCORP 1983-1988, December 1983, Massachusetts Department of Environmental Management; A Strategic Plan for the Restoration of Atlantic Salmon to the Connecticut River Basin, September 1982, Policy Committee for Fisheries Management of the Connecticut River.

[63,577]

3 See *Montana Power Company*, 56 FPC 2008 (1976).

[63,580]

1 Figures and attachments referenced in the text are omitted from this document due to reproduction requirements.

[¶ 62,297]

Linweave, Inc., Project No. 2775-001 - Massachusetts

Order Issuing New License (Minor Project)

(Issued June 29, 1989)

Fred E. Springer, Director, Office of Hydropower Licensing.

Linweave, Inc. has filed a license application under Part I of the Federal Power Act (Act) to continue to operate and maintain the Gill Mill (D Wheel) Project, located on the Holyoke Canal, in Hampden County, Massachusetts. The hydroelectric facilities located along the Holyoke Canal system affect navigable waters of the United States.¹ The license for the project, which was issued on July 19, 1977 [59 FPC 736], with an effective date of March 1, 1941, expires on February 28, 1991. The existing license waived section 15 of the Act only as it relates to federal takeover.

Notice of the application has been published. No protests were filed in this proceeding, and

no agency objected to issuance of this license. Comments received from interested agencies and individuals have been fully considered in determining whether to issue this license. Motions to intervene were filed by the City of Holyoke Gas & Electric Department and the Holyoke Water Power Company (HWP) in order to be parties in this proceeding. HWP also requests that any license issued which utilizes HWP's Holyoke Canal System water be conditioned, as was the previous license, to require cooperation with HWP as the licensee for the Hadley Falls Project No. 2004. Article 202 is included to provide for appropriate cooperation.

¹ See 33 FPC 593, 594 (1965).

Comprehensive Development

Sections 4(e) and 10(a)(1) of the Act require the Commission to consider and balance in the public interest all uses of the waterway on which a project is proposed to be located.

The Gill Mill (D Wheel) Project has operated under the terms of its existing license since 1977. In the environmental assessment (EA), the staff analyzed the environmental effects of the continued operation of the project. Neither the resource agencies nor staff identified any significant conflicts between continued operation of the project as proposed by the applicant, and the environmental values of the project area.

Three alternatives to relicensing the Gill Mill (D Wheel) Project were also considered by the staff in its EA. They include: (1) issuance of an annual license; (2) issuance of a non-power license; and (3) denial of a license application. No alternative was identified that would have a higher or better use of the project in terms of providing power and environmental benefits without significant environmental cost.

Section 10(a)(2) of the Act also requires the Commission to consider the extent to which a proposed project is consistent with an existing federal, state, or local comprehensive plan. Under section 10(a)(2), federal, and state agencies filed seven comprehensive plans that address resources in Massachusetts. Of these plans, staff identified and reviewed four plans relevant to this project.² No conflicts between the proposed Gill Mill (D Wheel) Project and these four plans were found.

Therefore, the project as conditioned is determined to be best adapted to a comprehensive plan, pursuant to Section 10(a) of the Act, for improving a waterway and would provide for adequate protection, mitigation, and enhancement of fish and wildlife pursuant to Section 10(j) of the Act.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the Act requires the Commission to include license conditions, based on recommendations of federal and state fish and wildlife agencies, for the protection, mitigation, and enhancement of fish and wildlife. The environmental assessment for the Gill Mill (D Wheel) Project addresses the concerns of the federal and state fish and wildlife agencies;

however, recommendations are not needed for continued operation of the project.

ECPA Findings

Section 10(a)(2)(C) and section 15(a) of the Federal Power Act, as amended by the Electric Consumers Protection Act of 1986 (ECPA), requires the Commission to consider in writing the following factors in issuing new licenses.

The following discussions apply individually and collectively to the eight hydro projects owned and operated by Linweave, Inc. The eight projects are identified by FERC project numbers: 2497, 2758, 2766, 2768, 2770, 2771, 2772, and 2775.

Consumption Efficiency Improvement Programs (Section 10(a)(2)(C))

Since the applicant's primary business is the manufacture of paper products and not the generation or sale of electric power, no discussion of on-going or planned conservation and load-management programs is required in this document.

The Plans and Abilities of the Applicant to Comply with the Articles, Terms, and Conditions of Any License Issued to it and Other Applicable Provisions of Part I of the Act (Section 15(a)(2)(A))

The staff has reviewed the plans of the applicant to comply with the articles, terms, and conditions of any license issued to Linweave, Inc.

A review of the compliance record of the applicant indicates that the applicant's compliance with the terms and conditions of its current license has been satisfactory. The staff concludes that the applicant has demonstrated its ability to comply in a good faith manner with all articles, terms, and conditions of the license, and the staff concludes that the applicant would perform in a competent manner if issued a new license for the project.

The Plans of the Applicant to Manage, Operate, and Maintain the Project Safely (Section 15(a)(2)(B))

The staff has reviewed the applicant's plans to manage, operate, and maintain the project safely. There is no dam within the project boundaries to operate and maintain.

² Connecticut River 1982 Water Quality Management Plan, June 1983, Massachusetts Division of Water Pollution Control; Connecticut River Basin Fish Passage, Flow, and Habitat Alteration Considerations in Relation to Anadromous Fish Restoration, October 1981, Technical Committee for Fisheries Management of the Connecticut River; The Outdoor

Heritage of Massachusetts, SCORP 1983-1988, December 1983, Massachusetts Department of Environmental Management; A Strategic Plan for the Restoration of Atlantic Salmon to the Connecticut River Basin, September 1982, Policy Committee for Fisheries Management of the Connecticut River.

The eight projects draw carefully prescribed quantities of water from the Second Level Canal and discharge it to the Connecticut River below the projects. There is a flood wall located between the eight projects and the Connecticut River that ensures protection during flood conditions. When the river elevations reach 62 feet or higher, the eight projects are shut down and the headgates and tailrace gates are closed. The City of Holyoke Department of Public Works is responsible for implementing the flood wall operation schedule and closing the tailrace gates of the eight projects.

The applicant has operated the eight projects with a perfect employee safety and public safety record. There have been no deaths or lost-time injuries to employees from project operations, nor is there any record of injury or death to the public within the project boundaries.

Based upon a review of the available information on the project safety plans, the staff concludes that the applicant is capable of managing, operating, and maintaining the project in a safe manner.

The Plans and Abilities of the Applicant to Operate and Maintain the Project in a Manner Most Likely to Provide Efficient and Reliable Electric Service (Section 15(a)(2)(C))

The staff has reviewed the operation inspection reports by the NYRO and the applicant's project operation reports.

The applicant has full time employees in its engineering department that monitor the eight projects, including physically checking each unit several times daily. Additionally, the projects have automatic safety devices to shut down the units in case of abnormal operating conditions.

The applicant cleans the trashracks and lubricates the mechanical machinery regularly. The applicant provides for periodic inspection of the penstock and provides maintenance when needed.

The applicant has reported a total of seven unscheduled outages for the eight projects over the last five years. The outages ranged in length from 48 days to 114 days during which time the equipment was repaired. The applicant has rebuilt and/or overhauled seven of the generating units since February 1979 when the applicant purchased the eight projects.

The applicant has no plans to increase generation at the eight projects. The main reason for this is that the applicant is entitled to withdraw only a carefully prescribed quantity of water from the Second Level Canal under the terms of certain indenture agreements with HWP.

The applicant is in the paper-products manufacturing business, which is a highly competitive field and is very energy-intensive. Because of the competition in the paper-products market, the applicant must operate the project in the most efficient and reliable manner to maximize electric power sales revenues available to offset power purchases for use in its paper manufacturing operations.

The staff concludes that the project is being operated in an efficient and reliable manner.

The Need of the Applicant Over the Short and Long Terms for the Electricity Produced by the Project to Serve Its Customers (Section 15(a)(2)(D))

The applicant, Linweave, Inc., is a manufacturer of paper products and, as such, does not sell any of the electrical output of the eight hydroelectric projects (which it owns and operates as the current licensee) to end-use customers. Therefore, this document does not address the applicant's need for the electricity generated by the eight projects to serve its customers. The paper-products manufacturing business is today a highly competitive industry. Production costs in this industry are very energy intensive, due to the large amounts of electric energy used for the manufacture of paper. When deprived of a low-cost source (or sources) of electric energy, a paper manufacturer cannot survive in the market place for paper products.

All eight of the hydropower projects for which the applicant is applying for new licenses are operated in the run-of-the-river mode; and, as a result, the capacity and energy produced by them depend upon the available streamflow provided by the Second Level Canal of the Holyoke Water Power Company. This flow is subject to seasonal and yearly variations. The applicant's electric power demands at the several paper mills are determined by factors which are in no way correlated with water flow in the canal system. Because of this, and for other reasons affecting the applicant's paper-making electrical energy costs, Linweave has found it to be economically advantageous to sell the output of the eight projects to a local electric utility and purchase the power required by the Linweave paper mills.

The total net electrical output from all eight of the projects is currently being sold, and is expected to continue to be sold to Fitchburg Gas and Electric Light Company, pursuant to a power sales agreement dated March 25, 1982.

The applicant's present and future need for the electric power produced by the eight hydro projects, with which this document is concerned, can be stated in few words: revenues

received from the sale of project capacity and energy are used to offset the cost of capacity and energy purchased on an "as-needed, total requirements" purchase agreement with a local utility, thus improving Linweave's competitive position in the paper products marketplace, which may prove necessary for industrial survival.

The total installed capacity of the eight hydro projects is 3.362 megawatts, and the applicant estimates that the projects are capable of producing an average of 16,997 megawatthours of energy annually.

The staff concludes that there is a need for the project power over the short and the long term.

The Existing and Planned Transmission Services of the Applicant (Section 15(a)(2)(E))

If the applicant is issued new licenses for the eight hydro projects listed above, no changes of the existing transmission system, its operation, or operating characteristics would occur as a result thereof, and none are planned.

If new licenses are denied, the transmission system, or systems associated with the eight projects, would no longer be required, since the applicant would no longer generate power to sell. The applicant would continue to purchase "all requirements" power required for the operation of the paper mills from a local utility. Transmission would not be affected by denial of the licenses.

The staff concludes that the transmission services are adequate as they currently exist.

Whether the Plans of the Applicant will be Achieved, to the Greatest Extent Possible, in a Cost Effective Manner (Section 15(a)(2)(F))

The Gill Mill was constructed in 1880 and the present hydroelectric generating unit rebuilt in 1983. No new construction is proposed. The annual cost of operating the project would be its annual operation and maintenance costs. Continued future project operation would serve to provide an economically efficient source of energy for Linweave, Inc. The staff concludes that the project is economically beneficial.

The Applicant's Record of Compliance with the Terms and Conditions of the Existing License (Section 15(a)(3))

The compliance records of Linweave, Inc., with the terms and conditions of its existing licenses, are satisfactory. Further, the licensee has maintained the projects in a satisfactory manner.

The licensee is reminded that failure to comply with the terms and conditions of this license will subject it to the enforcement and penalty provisions of section 31 of the Federal Power Act.

Term of License

Section 15 of the Act, as amended by ECPA specifies that any license issued under section 15 shall be for a term which the Commission determines to be in the public interest, but not less than 30 years, nor more than 50 years from the date the license is issued. This provision is similar to pre-ECPA Commission policy, which was to establish from the expiration date of the existing license, 30-year terms for those projects which proposed no new construction or capacity, 40-year terms for those projects that proposed a moderate amount of new development, and 50-year terms for those projects that proposed a substantial amount of new development.³

Linweave, Inc. proposes no modifications to the existing project facilities or change in operation of the project. However, the existing license will not expire until February 28, 1991. Accordingly, the new license for the project will be for a term of 30 years from the expiration of the existing license.

Summary of Findings

An EA was issued for this project. Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the EA attached to this order. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if operated and maintained in accordance with the requirements of this license. Analysis of related issues is provided in the Safety and Design Assessment attached to this order.

The Director, Office of Hydropower Licensing, concludes that the project would not conflict with any planned or authorized development, and would be best adapted to comprehensive development of the waterway for beneficial public uses.

The Director orders:

(A) This license is issued to Linweave, Inc. (licensee), for a period of 30 years, effective March 1, 1991, to operate and maintain the Gill Mill (D Wheel) Project. This license is

³ See *Montana Power Company*, 56 FPC 2008 (1976).

subject to the terms and conditions of the Act, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, shown by exhibit G:

Exhibit	FERC No.	Showing
G-1	2775-3	Project Location

(2) Project works consisting of: (a) a gated intake with submerged trashracks located on the second level canal of the Holyoke Water Power Company; (b) a 12-foot-diameter penstock 295 feet long; (c) a 450-kW generating unit located within the Gill Mill building; (d) two parallel 7-foot-wide by 10-foot-high arched brick-lined tailrace tunnels extending from the draft tube to an existing outlet structure; (e) a concrete gated outlet structure where tailwater empties into a channel that leads to the Connecticut River; (f) a 13.8-kV transmission line 660 feet long that connects the project to an existing transmission line; and (g) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of exhibits A and F recommended for approval in the attached Safety and Design Assessment.

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project, all portable property that may be employed in connection with the project and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The exhibit G described above and those sections of exhibits A and F recommended for approval in the attached Safety and Design Assessment are approved and made part of the license.

(D) The following sections of the Act are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates to public notice and to the acceptance and expression in the license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15; 16; 19; 20; and 22.

(E) This license is subject to the articles set forth in Form L-9 (October 1975) [reported at 54 FPC 1852], entitled "Terms and Conditions of License for Constructed Minor Project

Affecting Navigable Waters of the United States", and the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective March 1, 1991:

For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 600 horsepower.

Article 202. The Licensee shall cooperate with the licensee for Project No. 2004 in order that the conditions of Article 16 of the license for Project No. 2004 can be fulfilled.

Article 401. Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or provide for the construction, operation, and maintenance of such fishways, as may be prescribed by the Secretary of the Interior pursuant to section 18 of the Federal Power Act.

Article 402. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and water for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommo-

date no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

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

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

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

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

the lands to be conveyed do not have recreational value.

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

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

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

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(G) This order is issued under authority delegated to the Director and is final unless appealed to the Commission by any party within 30 days from the issuance date of this order. Filing an appeal does not stay the effective date of this order or any date specified in

this order. The licensee's failure to appeal this order shall constitute acceptance of the license.

Environmental Assessment¹

Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Project Review

Date: June 16, 1989

Project name: Gill Mill, D Wheel, Hydroelectric Project

FERC Project No. 2775-001

A. Application

1. Application type: New minor license
2. Date filed with the Commission: November 25, 1988
3. Applicant: Linweave, Inc.
4. Water body: Holyoke Canal; River basin: Connecticut
5. Nearest city or town: Holyoke (See figure 1.)
6. County: Hampden; State: Massachusetts

B. Purpose and Need for Action

1. Purpose.

Linweave estimates the average annual energy generation of the Gill Mill, D Wheel, Hydroelectric Project is 1,790 megawatt-hours. Project power is sold to the Fitchburg Gas and Electric Light Company.

2. Need for power.

The power from the project is useful in meeting a small part of the need for power projected for the New England Power Pool area of the Northeast Power Coordinating Council (NPCC) region. Power generated at the project displaces fossil-fueled power generation in the NPCC region, thus conserving nonrenewable fossil fuels and reducing the emission of noxious byproducts caused by the combustion of fossil fuels.

C. Proposed Project and Alternatives

1. Description of the proposed action. (See figure 2.)

The existing operating project was issued an initial license in 1977, which will expire in 1991. The licensee has filed for a new license for the continued operation of the project. The existing operating project consists of: (i) a gated intake with submerged trashracks located on the second level canal of the Holyoke Water Power Company; (ii) a 12-foot-

¹ Figures and attachments referenced in the text are omitted from this document due to reproduction requirements.

diameter penstock 295 feet long; (iii) an existing 450-kW generating unit located within the Gill Mill building; (iv) two parallel 7-foot-wide by 10-foot-high arched brick-lined tailrace tunnels extending from the draft tube to an existing outlet structure; (v) a concrete gated outlet structure where tailwater empties into a channel that leads to the Connecticut River; (vi) a 13.8-kV transmission line 660 feet long that connects the project to an existing transmission line; and (vii) appurtenant facilities. The project operates in a run-of-river mode. Linweave does not propose any construction or change in project operation. The Holyoke Water Power Company controls flows from the Connecticut River into the canal system under a FERC major license granted to Project No. 2004.

2. Applicant's proposed mitigative measures.

Since Linweave proposes to continue operating the project as in the past, with no new construction, no changes to the hydroelectric project, and no changes in the use and release of water, Linweave proposes no mitigative measures.

3. Federal lands affected.

No.

4. Alternatives to the proposed project.

a. *Issuance of an annual license.* Section 15(a) of the Federal Power Act (Act), 16 U.S.C. § 808(a), provides for the issuance of annual licenses to the prior licensee if the license expires pending the relicensing determination. Under this alternative, an annual license would continue to be issued to Linweave until a new license is issued. The annual license contains the same terms as the expired license, thereby maintaining the status quo.

b. *Issuance of a non-power license.* Section 15(f) of the Act, § 808(b), authorizes the Commission to issue a license for nonpower use when the Commission "finds that in conformity with a comprehensive plan for improving or developing a waterway or waterways for beneficial public uses all or part of any licensed project should no longer be used or adapted for use for power purposes." A license that is granted by the Commission for nonpower use is temporary. When the Commission finds that a state, municipality, interstate agency, or another federal agency is authorized and willing to assume regulatory supervision of the lands and facilities included under the nonpower license and does so, the Commission shall thereupon terminate the nonpower license.

c. *Denial of the license application.* Denial of the license application could lead to removal of the power facilities and removal of all project works.

D. Consultation and Compliance

1. Fish and wildlife agency consultation (Fish & Wildlife Coordination Act).

a. U.S. Fish & Wildlife Service: Yes.

b. State(s): Yes.

c. National Marine Fisheries Service: Yes.

2. Section 7 consultation (Endangered Species Act).

a. Listed species: Present:

b. Consultation: Not required.

Remarks: The federally listed endangered shortnose sturgeon under the jurisdiction of the National Marine Fisheries Service (NMFS) inhabits the lower segment of the Connecticut River from the river's mouth upstream to the Holyoke dam. A small landlocked population is found in the pool above the Holyoke dam (Taubert, 1980). Dadswell, *et al.* (1984) estimated that between 800 and 1000 shortnose sturgeon inhabit the lower portion (below Holyoke) of the Connecticut River. The NMFS reports that due to the trashrack spacing, any sturgeon which might enter the canal would be prevented from entrainment into the project (personal communication, Chris Mantzaris, staff, National Marine Fisheries Service, Gloucester, Massachusetts, June 13, 1989).

3. Section 401 certification (Clean Water Act).

Required; applicant requested certification on 10/17/88.

Status: Granted by the certifying agency on 03/30/89.

4. Cultural resource consultation (Historic Preservation Act).

a. State Historic Preservation Officer: Yes.

b. National Park Service: Yes.

c. *National Register* status: Eligible or listed.

d. Council: Not required.

e. Further consultation: Not required.

Remarks: The project is adjacent to the Holyoke Canal System, a property listed in the *National Register of Historic Places*. Since there would be no redevelopment, new construction, or changes to the exterior of the property, the project would not affect the canal system or any other *National Register* or eligible properties. The SHPO concurs with this finding (letter from Valerie A. Talmage, Executive Director, Massachusetts Historical Commission, and State Historic Preservation Officer, Boston, Massachusetts, December 9, 1988).

5. Recreational consultation (Federal Power Act).

a. U.S. Owners: No.

b. National Park Service: Yes.

c. State(s): Yes.

6. Wild and scenic rivers (Wild and Scenic Rivers Act).

Status: None.

7. Land and Water Conservation Fund lands and facilities (Land and Water Conservation Fund Act).

Status: None.

E. Comments

1. The following agencies and entities provided comments on the application or filed a motion to intervene in response to the public notice dated 03/24/89.

<i>Commenting agencies and other entities</i>	<i>Date of letter</i>
---	-----------------------

Department of the Army, New England Division Corps of Engineers	05/11/89
Environmental Protection Agency	05/17/89
Department of the Interior	05/19/89
Massachusetts Division of Fisheries and Wildlife	05/30/89

<i>Motions to intervene</i>	<i>Date of motion</i>
-----------------------------	-----------------------

City of Holyoke, Gas and Electric Department	03/28/89
Holyoke Water Power Company	05/24/89

2. The applicant did not respond to the comments or motion(s) to intervene.

F. Affected Environment

1. General description of the locale. (See figure 3.)

a. Description of the Connecticut River Basin.

The Connecticut River Basin, with a drainage area of 11,765 square miles, is the largest river basin in New England. Extending from the northernmost part of New Hampshire to Long Island Sound, the river basin has a maximum length in a north-south direction of about 280 miles and a maximum width of about 62 miles. The total drainage area of the basin is 11,765 square miles. The principal tributaries to the mainstem Connecticut River, by state, are the Passumpsic, White, West, Ottauquechee, and Black Rivers in Vermont; the Ammonoosuc, Mascoma, Ashuelot, and Sugar Rivers in New Hampshire; the Millers, Deerfield, Chicopee, and Westfield Rivers in Massachusetts; and the Farmington River in Connecticut.

This complex of rivers and tributaries constitutes one of the most extensively developed hydropower systems in the U.S. There is now a major effort by federal, state, and private sectors to restore Atlantic salmon to the Connecticut River Basin.

The project is located in a heavily industrialized setting between the second level of the Holyoke Canal system and the Connecticut River. The climate is typical of inland Connecticut and Massachusetts with an average temperature of 49.8 degrees Fahrenheit and an average annual precipitation of 44.39 inches.

b. Licensed and exempted projects.

There are 62 existing licensed projects and 38 exempted projects in the Connecticut River Basin, as of June 1, 1989.

c. Pending applications.

There are 10 pending license applications in the Connecticut River Basin, as of June 1, 1989.

d. Cumulative impacts.

Cumulative impacts are defined as impacts on the environment that result from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions regardless which agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 C.F.R., Part 1508.7).

A target resource is an important resource that may be cumulatively affected by multiple development within a basin. The staff identified Atlantic salmon as the target resource in the Connecticut River Basin (Federal Energy Regulatory Commission, 1986). The selection was based on the regional significance and geographic distribution of this species within the river basin. This anadromous fishery resource is described below in section F(2d). Impacts to Atlantic salmon are discussed in section G.

2. Descriptions of the resources in the project impact area (Source: Linweave, Inc., application, exhibit E, unless otherwise indicated).

a. *Geology and soils:* Bedrock in the project area is interbedded sandstone, shale, conglomerate, and basaltic lava. The glacial till deposits that lie on the glaciated surface of the bedrock are overlain by varied glacial lake deposits. The original dry, sandy, surface soils in the project area have been highly altered by construction of the project and by fill and construction activities associated with urban development of the area.

b. *Streamflow:* Water flow in the canal system is controlled at the canal gatehouse in order to supply necessary water to various hydropower and industrial facilities along the

canal. The amount of flow entering the canal system ranges from no flow, when the gatehouse is shut down, to 5,155 cubic feet per second, which is the maximum hydraulic capacity of the canal.

c. *Water quality*: The Connecticut River upstream of Holyoke dam is classified as Class B water by the Massachusetts Division of Water Pollution. Class B water is suitable for primary and secondary contact recreation and fish and wildlife resources. Class B water must have dissolved oxygen (DO) levels greater than 5.0 milligrams per liter (mg/l) and a pH between 6.5 and 8.0. The first level canal is classified as Class C. Class C water is suitable for secondary contact recreation and fish and wildlife resources and must have a DO level greater than 5.0 mg/l and a pH between 6.5 and 9.0 standard units. Water in the project area conforms to the state water quality standards.

d. *Fisheries*:

Anadromous: Present.

Anadromous fish species found in the Connecticut River in the vicinity of the project include American shad, Atlantic salmon, blueback herring, sea lamprey, striped bass, shortnose sturgeon, and American eel (catadromous).

Resident: Present.

Resident fish species found in the Connecticut River in the vicinity of the project include carp, channel catfish, smallmouth bass, largemouth bass, spottail shiner, white perch, bluegill, rainbow trout, and brown trout.

e. *Vegetation*: Dominant vegetative species in the vicinity of the project include oak, maple, white pine, pitch pine, grasses, and ornamental shrubs.

f. *Wildlife*: Undeveloped land in the project area provides habitat for the gray squirrel, eastern cottontail rabbit, raccoon, muskrat, beaver, weasel, pheasant, and small field mammals (mice and voles). The industrial area is inhabited by English sparrows, starlings, robins, mockingbirds, Norway rats, raccoons, and eastern cottontail rabbits.

g. *Cultural*:

There are properties listed on, or eligible for listing on, the *National Register of Historic Places* in the project impact area.

Description: The Holyoke Canal System, a contributing element in the Holyoke Canal Historic District, is listed on the *National Register of Historic Places* and is within the area of the project's potential environmental impact. The portion of the canal in the project area was constructed between 1854 and 1857.

h. *Visual quality*: The project is in an industrial area. Its appearance is consistent with that of the surrounding buildings and structures.

i. *Recreation*: The immediate project area receives no significant recreational use because of its location in a highly industrialized area. No recreational facilities are located at the project. Recreational facilities including playgrounds, swimming pools, and a skating rink are available for use within walking distance of the project. The Connecticut River in the project vicinity is used for boating and fishing.

j. *Land use*: The project is entirely within the city of Holyoke. Land in the project area is primarily used for commercial, industrial, and residential purposes. The canal system is used for generating hydroelectric power at several locations.

k. *Socioeconomics*: The socioeconomic well-being of the area is influenced by industrial and urban development.

G. *Environmental Issues and Proposed Resolutions*

There are 3 issues addressed below.

1. *Cumulative impacts on Atlantic salmon resulting from developing several hydropower projects in the Connecticut River Basin*: The Atlantic salmon is currently a primary target species for a major federal, state, and private sector restoration effort. The goal of the restoration program is to provide and to maintain a sport fishery for Atlantic salmon in the Connecticut River, and to restore and maintain a spawning population in selected tributaries (Federal Energy Regulatory Commission, 1986).

Seaward migrating salmon smolts in the river basin pass numerous hydropower developments where they may become entrained and impinged. The more hydropower facilities outmigrating fish have to pass, the greater the fish losses. Among these hydropower facilities are the Holyoke dam and the canal system.

When river discharges are high and water is flowing over the dam, migrating fish pass downstream with little or no delay (Northeast Utilities Service Company, 1984). On the other hand, outmigrating fish would be entrained into the canal system by high flows entering the canal if they arrive at the dam when flashboards, permitting little or no spillage, are in place. Once in the canal, escape is very difficult. Fish can then be entrained in the turbines of hydropower plants operating along the canal.

On February 26, 1988, the Commission ordered the Holyoke Water Power Company (HWPC) to spill water over Holyoke dam when

salmon smolts are migrating downstream (Federal Energy Regulatory Commission, 1988a). [HWPC is the licensee for the Hadley Falls Project (FERC Project No. 2004) and the entity that controls the dam and the water going into the canal.] Spilling water over the Holyoke dam allows migrating salmon smolts to pass safely downstream in the spill, instead of entering the canal system.

Canal users and the HWPC have since implemented an economic dispatch agreement, in which the HWPC passes all flow downstream at the Holyoke dam and sells the users electricity, instead of water, when salmon smolts are migrating downstream. Linweave participates in this agreement. This arrangement prevents flow from entering the canal and attracting outmigrating Atlantic salmon, and minimizes the number of outmigrating Atlantic salmon trapped in the canal, and the number of project-related impacts to fish in the river basin.

Continuing to operate the Gill Mill, D Wheel, Hydroelectric Project would not contribute to cumulative adverse impacts on Atlantic salmon.

2. *Authority to prescribe fish passage facilities:* The Department of the Interior states that fish passage facilities may be needed at the project in the future, and, by letter of May 24, 1989 they reserve the authority to prescribe such fish facilities. The Commission reserves authority to require the licensee to provide fishways, as may be prescribed by the Secretary of Interior pursuant to section 18 of the Federal Power Act, if the need arises in the future.

3. *Entraining fish in the intake structure:* The Massachusetts Division of Fisheries and Wildlife (DFW) recommended the trashracks at the intake structures have a bar spacing not greater than 1 inch to prevent the entrainment of fish. The project's intake opening includes trashracks with one-inch slot width spacing between bars. The bar spacing at the existing structure satisfies the DFW's recommendation.

H. Environmental Impacts

1. Assessment of impacts expected from the applicant's proposed project (P), with the applicant's proposed mitigation and any conditions set by a federal land management agency; the proposed project with any additional mitigation recommended by the staff (Ps); and any action alternative considered (A).

FERC Reports

Assessment symbols indicate the following impact levels:

O = None;	1 = Minor;
2 = Moderate;	3 = Major;
A = Adverse;	B = Beneficial;
L = Long-term;	S = Short term.

Resource	P	Impact Ps	A
a. Geology-Soils	0		
b. Streamflow	0		
c. Water quality:			
Temperature	0		
Dissolved oxygen	0		
Turbidity and sedimentation	0		
d. Fisheries:			
Anadromous	0		
Resident	0		
e. Vegetation	0		
f. Wildlife	0		
g. Cultural:			
Archeological	0		
Historical	0		
h. Visual quality	0		
i. Recreation	0		
j. Land use	0		
k. Socioeconomics	0		

2. Recommended alternative (including proposed, required, and recommended mitigative measures):

Proposed project.

3. Reason(s) for selecting the preferred alternative.

The power generated at this project is produced without any known adverse environmental impacts.

I. Unavoidable Adverse Impacts of the Recommended Alternative

There are no known adverse impacts.

J. Conclusion

Finding of No Significant Impact. Approval of the recommended alternative [H(2)] would not constitute a major federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement (EIS) will not be prepared.

K. Literature Cited

- Dadswell, M.J., B.D. Taubert, T.S. Squires, D. Marchette, and J.L. Buckley. 1984. Synopsis of biological data on shortnose sturgeon (*Acipenser brevirostrum*) Lesueur 1818. National Oceanic and Atmospheric Administration Technical Report NMFS 14, National Oceanic and Atmospheric Administration, Washington, D.C., 45pp.
- Linweave, Inc: 1988. Application for minor license for the Gill Mill, D Wheel, Hydroe-

lectric Project, FERC Project No. 2775, Massachusetts. November 25, 1988.

1989a. Supplement to the application for minor license for the Gill Mill, D Wheel, Hydroelectric Project, FERC Project No. 2775, Massachusetts. February 21, 1989.

1989b. Additional information for the application for minor license for the Gill Mill, D Wheel, Hydroelectric Project, FERC Project No. 2775, Massachusetts. March 20, 1989.

Northeast Utilities Service Company. 1984. Review of cancelled Atlantic salmon smolt (*Salmo salar*), radiotelemetry study at the Holyoke dam, Massachusetts. Hartford, Connecticut. September 1984.

Federal Energy Regulatory Commission. 1983. Planning status report for the Connecticut River Basin. Washington, DC. August 1983.

1986. Environmental assessment for the Connecticut River Basin. Washington, DC. November 7, 1986.

1988a. Order amending license for the Hadley Falls Project, FERC Project No. 2004, Massachusetts. February 26, 1988 [42 FERC ¶ 62,166].

1988b. Environmental assessment for the Number 2 Hydro Unit, FERC Project No. 2387, Holyoke, Massachusetts. August 26, 1988.

Taubert, B.D. 1980. Biology of shortnose sturgeon (*Acipenser brevirostrum*) in the Holyoke Pool, Connecticut River, Massachusetts. Ph.D. Thesis. University of Massachusetts, Amherst, 136 pp.

L. List of Preparers (Name—Position title)

James T. Griffin—Archeologist (Coordinator)

Rainer Feller—Ecologist

Peter Leitzke—Geologist

Ann E. Mates—Environmental Protection Specialist

Mary Nowak—Editor

Marc Zimmerman—Ecologist

Safety and Design Assessment

Gill Mill (D Wheel) Hydroelectric Project

FERC Project No. 2775-001, MA

Project Safety

The applicant for the Gill Mill (D Wheel) Project is Linweave, Inc., a manufacturer of paper products. No dam or spillway is included in the project works. All water is delivered to the project via the Holyoke Second Level Canal, which is owned and operated by the Holyoke Water Power Company (HWP).

The New York Regional Office (NYRO), in an Operation Inspection Report dated October

10, 1986, indicated that the existing project had no downstream hazard potential. Since there is no dam, the staff concludes that there are no dam safety problems.

Project Design

The existing project works consist of: (1) a gated intake with submerged trashracks located on the Second Level Canal of the HWP; (2) a 295-foot-long, 12-foot-diameter steel penstock; (3) a single runner, Francis turbine directly coupled to a 450-kilowatt (kW) Westinghouse generator; (4) two 125-foot-long, 7-foot-wide by 10-foot-high arched, brick-lined tailrace tunnels; (5) a concrete gated outlet structure where the tailwater empties into a channel that leads to the Connecticut River; and (6) appurtenant facilities. The 310-foot-long by 325-foot-wide Gill Mill building which houses the generating equipment is not considered part of the project works.

The primary transmission lines to be included in a new license for Project No. 2775 can be described as a 660-foot run of three-phase, 0.6-kilovolt (kV) overhead line extending from the 0.6-kV terminals of the project generator to the 0.6-kV terminals of the Mt. Tom step-up transformer; and a 90-foot run of three-phase, 13.8-kV overhead line extending from the 13.8-kV terminals of the Mt. Tom step-up transformer bank to the 13.8-kV substation owned by the Holyoke Water Power Company (HWP).

In addition to the primary lines, the new license should include the single-runner Francis turbine, the 450-kilowatt (kW) Westinghouse generator, all necessary switchgear, all installed electrical protection and control apparatus, and all instrumentation. No step-up transformer is included since Project No. 2775 shares the kilovoltampere (kVA) capacity of the Mt. Tom step-up transformer bank.

The applicant has proposed no new construction or improvements for the existing project; therefore, the project license does not need to include any special engineering articles.

The NYRO October 1986 Operation Inspection Report cited no deficiencies in project safety or operation. There is no dam within the project boundaries.

The staff concludes that the project would be safe and adequate if operated in conformance with the terms of a new license.

Water Resource Planning

The project works would contain one 450-kW generator directly connected to a Francis turbine. The gross head at the site ranges from 24 to 32 feet depending upon the tailwater elevation and the average head is 30 feet. The design head of the turbine is 32 feet and its

hydraulic capacity is estimated to be 161 cubic feet per second (cfs). The applicant indicated that the project generated 1,790 megawatt-hours (MWh) annually. The staff finds that the plant factor would be 45 percent. The project would continue to be operated manually in a run-of-river mode.

All water to the project is delivered via the Second Level Canal. The Second Level Canal is one of a series of three canals (First Level Canal, Second Level Canal, and Third Level Canal) that receives water from the Hadley Falls Project (FERC Project No. 2004) on the Connecticut River. The HWP owns and operates the Hadley Falls Project and its canal system, which delivers water to various manufacturing and other business concerns for process purposes and power generation. The applicant for the Gill Mill (D Wheel) Project is Linweave, Inc.

The water for power generation is allocated in the form of mill powers (mp) to owners of lands adjacent to the canal system, under indentures or contracts between the individual property owners and the HWP.

These "mp" quantities vary according to water flow in the Connecticut River and fall into the following three categories:

Permanent power - the amount of water sold to Linweave whenever the average daily river flows in the Connecticut River are equal to or greater than 3,100 cfs.

Surplus power - water offered for sale to owners of the so-called permanent power rights whenever average river flows in the Connecticut River are equal to or greater than 3,600 cfs.

Non-permanent power - water which is not guaranteed, but which would be furnished when there is more than a sufficient quantity of water in the river to supply all the permanent power owners together with 50 percent of it as surplus. Water would be supplied 6 days a week (but not on Sundays or holidays) when the river flows are equal to or greater than 3,865 cfs. Sunday and holiday operation is allowed when the average river flows exceed approximately 4,300 cfs.

Under the allocation terms of the indentures, Linweave is entitled, in perpetuity, to draw a carefully prescribed quantity of water from the HWP canal system for power generation and discharge it into the Connecticut River below the project. Linweave is also entitled to purchase and use such surplus water as the HWP makes available from time to time.

The Gill Mill (D Wheel) Project is authorized one type of water allocation rights based on the indentures: non-permanent. For non-permanent power allocations, the Gill Mill (D Wheel)

Project is authorized to withdraw 5.2 mp or 150 cfs. Based on the staff's flow duration curve for the Connecticut River, the applicant can withdraw 150 cfs about 87 percent of the time. Whenever the flows in the Connecticut River exceed 15,000 cfs, the applicant can withdraw the maximum hydraulic capacity of the turbine unit, which is 161 cfs, from the Second Level Canal. The staff estimates that this could occur about 31 percent of the time.

The applicant has estimated that the project operates at its maximum capacity (161 cfs) about 26 percent of the time, and at its non-permanent allocation (150 cfs) about 58 percent of the time. Based on the applicant's estimates, the project would be shut down 16 percent of the time. The NYRO 1986 Operation Inspection Report indicated that the canal system is shut down 3 times a year: once in April, once in July, and once in October. During those periods, the canal system is drained, inspected, and repaired if needed. The repairs are generally scheduled for the July shutdown.

There are certain periods of the year when the project cannot operate and the applicant is directed by the HWP to discontinue drawing water from the canal system. These periods include: (1) periods when the canal system is dewatered for inspection and maintenance; (2) periods of low flow in the Connecticut River when a public authority has required that the low flows be released at the Hadley Falls Project rather than through the canals according to the indentures, without generating power; and (3) periods when a public authority requires that the waters of the Connecticut River flow through the HWP's hydroelectric generating facilities at the Hadley Falls Project rather than through the canal system according to the indentures. During the latter periods when the HWP generates power at the Hadley Falls Project rather than releases water through the canal system, the applicant is entitled to compensation in kilowatt-hours (in lieu of water) under the terms of the Water Use Agreement (or Economic Dispatch Agreement). In 1987, the compensation provided under the Economic Dispatch Agreement amounted to 1,545 MWh for the eight projects owned by the applicant.

The staff's independent analysis shows that the applicant makes reasonable use of its allocated water. Because of the water allocation limits of the HWP, the applicant cannot develop additional potential at the site. Hence, the staff concludes that the applicant has properly developed the head and hydraulic potential of the site.

The August 1983 Planning Status Report for the Connecticut River Basin lists 19 existing hydroelectric projects, including the Gill Mill

(D Wheel) Project, which are located on the canal system owned by HWP. The applicant owns eight of these projects. The report also listed the Holyoke Project on the canal system as a potential project with an installed capacity of 1,222 MW and an annual generation of 13,165 MWh. The report did not indicate any proposed project on the canal system that would be in conflict with the Gill Mill (D Wheel) Project.

The staff's review of the state and federal agency comments and of seven comprehensive resource development plans identified no plans with which the existing project would be in conflict within this reach of the Second Level Canal. The staff presently has no specific comments or recommendations from reviewing agencies addressing flood control, navigation, or water supply requirements for the Second Level Canal. No competing applications for the project are currently pending before the Commission.

The City of Holyoke, Massachusetts Gas and Electric Department, and the HWP filed petitions to intervene in the licensing proceeding. Neither party opposes the issuance of a license, but each want to protect its interests. The HWP submitted a series of technical comments correcting certain information in the application. None of the corrections affect this report.

The generation from this project is equivalent to generation produced from burning 2,940 barrels of oil or 830 tons of coal annually in a steam-electric plant.

In summary, the staff's analysis shows that the existing project is properly designed to develop the hydropower potential of the site.

Economic Evaluation

The proposed project would be economically beneficial, so long as the projected levelized

cost is less than the levelized cost of alternative energy and capacity.

In the case of the Gill Mill (D Wheel) Project, the applicant has proposed no new construction. Hence, the levelized project costs would be the operation and maintenance costs and administrative and general costs. These costs are small compared to the value of the power.

The applicant currently sells the project power to Fitchburg Gas & Electric Light Company, pursuant to a power sales agreement dated March 25, 1982, and it would continue to do so.

The staff concludes that the existing project is economically beneficial.

Exhibits

The staff concludes that the following parts of exhibit A and the following exhibit F drawings conform to the Commission's rules and regulations. The staff therefore includes these in the license:

Exhibit A - The following sections of exhibit A filed November 25, 1988:

The turbine and generator description on page A-2; the transmission line description on pages A-2 and A-3, as corrected by letter dated April 10, 1989; and the additional mechanical and electrical equipment description on pages A-1 through A-7.

<i>Exhibit</i>	<i>FERC No.</i>	<i>Showing</i>
F-1	2775-3	Site Plan
F-2	2775-4	Powerhouse Plan and Elevation

Preparers

Ronald E. Spath, Civil Engineer
C. Frank Miller, Electrical Engineer

46 FERC ¶62,229, City of Holyoke, Massachusetts, Project No. 2386-001, (Feb. 28, 1989)

<http://prod.resource.cch.com/resource/scion/document/default/%28%40%40FERC-FEG-02+46FERCP62229PAGE63360%29200996112854468DOC21130>

City of Holyoke, Massachusetts, Project No. 2386-001

[63,360]

[¶62,229]

City of Holyoke, Massachusetts, Project No. 2386-001

Order Issuing License (Minor Project)

(Issued February 28, 1989)

Fred E. Springer, Director, Office of Hydropower Licensing.

City of Holyoke, Massachusetts filed a license application under Part I of the Federal Power Act (Act) to operate and maintain the Holyoke Number 1 Hydro Project located on the canal system fed by the Connecticut River in the City of Holyoke, in Hampden County, Massachusetts. The Connecticut River is a navigable waterway of the United States.¹

Notice of the application has been published. No protests or motions to intervene were filed in this proceeding, and no agency objected to issuance of this license. Comments received from interested agencies and individuals have been fully considered in determining whether to issue this license.

Section 10(a)(2)-Comprehensive Plans

Section 10(a)(2) of the Act requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans (where they exist) for improving, developing, or conserving a waterway or waterways affected by the project. The staff reviewed 3 plans that address various aspects of waterway management in relation to the proposed project.² No conflicts were found.

Based upon a review of the agency and public comments filed in this proceeding, and on the staff's independent analysis, the Holyoke Number 1 Hydro Project is best adapted to a comprehensive plan for the Connecticut River.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the Act requires the Commission to include license conditions, based on recommendations of federal and state fish and wildlife agencies, for the protection, mitigation, and enhancement of fish and wildlife. The environmental assessment for the Holyoke Number 1 Hydro Project addresses the concerns of the federal and state fish and wildlife agencies; however, recommendations are not needed for continued operation of the project.

Summary of Findings

An EA was issued for this project. Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the EA attached to this order. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if operated and maintained in accordance with the requirements of this license. Analysis of related issues is provided in the Safety and Design Assessment attached to this order.

The Director, Office of Hydropower Licensing, concludes that the project would not conflict with any planned or authorized development, and would be best adapted to comprehensive development of the waterway for beneficial public uses.

The Director orders:

(A) This license is issued to City of Holyoke, Massachusetts (licensee), for a period of 30 years, effective the first day of the month in which this order is issued, to operate and maintain the Holyoke Number 1 Hydro Project. This license is subject to the terms and conditions of the Act, which is incorporated by reference

[63,361]

as part of this license, and subject to the regulations the Commission issues under the provisions of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, enclosed by the project boundary shown by exhibit G:

Exhibit G- FERC No. 2386- Showing

sheet 1 16 Project Maps

(2) Project works consisting of: (a) a brick powerhouse 38 feet wide and 50 feet long containing two 240-kW and two 288-kW turbine-generators with a total capacity of 1,056 kW; (b) two steel penstocks 10 feet in diameter and 36.5 feet long; (c) two tailraces 328.5 feet long and 20 feet wide; and (d) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of exhibits A and F recommended for approval in the attached Safety and Design Assessment.

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

(C) The exhibit G described above and those sections of exhibits A and F recommended for approval in the attached Safety and Design Assessment are approved and made part of the license.

(D) The following sections of the Act are waived and excluded from the license for this minor project: 4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates to public notice and to the acceptance and expression in the license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15; 16; 19; 20; and 22.

(E) This license is subject to the articles set forth in Form L-9 [reported at 54 FPC 1852] (October 1975), entitled "Terms and Conditions of License for Constructed Minor Project Affecting Navigable Waters of the United States", and the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective the first day of the month in which this license is issued:

For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 1,480 horsepower.

Article 401. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes,

if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and water for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are

[63,362]

maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

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

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

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

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

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

[63,363]

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

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

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(G) This order is issued under authority delegated to the Director and is final unless appealed to the Commission by any party within 30 days from the issuance date of this order. Filing an appeal does not stay the effective date of this order or any date specified in this order. The licensee's failure to appeal this order shall constitute acceptance of the license.

Environmental Assessment¹

Federal Energy Regulatory Commission

Office of Hydropower Licensing

Division of Project Review

Date: January 12, 1989

Project Name: Number 1 Hydro Unit

FERC Project No. 2386

A. Application

1. *Application type:* This is an application for a new minor license filed with the Commission on February 19, 1988, by the City of Holyoke, Massachusetts, Gas and Electric Department (Holyoke).

2. *Location:* The project is located on the Holyoke Canal, in the Connecticut River basin; Holyoke, Hampden County, Massachusetts (see Figure 1).

B. Purpose and Need for Power

1. *Purpose:* The project provides an estimated average annual generation of 3.3 gigawatthours of electricity which is sold to Holyoke's customers.

2. *Need for power:* The power from the project is useful in meeting a small part of the need for power projected for the New England Power Pool area of the Northeast Power Coordinating Council (NPCC) region. Power generated at the project displaces fossil-fueled power generation in the NPCC region, thus conserving nonrenewable fossil fuels and reducing the emission of noxious byproducts caused by the combustion of fossil fuels.

C. Existing Project and Alternatives

1. *Description of the existing project:* The existing operating project facilities were constructed in 1893, to generate electricity using available flows and a 19.5-foot differential between two levels of the Holyoke Canal System. The Holyoke Water Power Company (HWPC) controls flows from the Connecticut River into the canal system under a FERC major license granted to Project No. 2004. Unit 1's project works consist of the following existing elements.

The brick powerhouse measures 38 feet by 50 feet in plan, and contains two 330 horsepower (hp) turbines connected to two 240 kilowatt (kW) vertical hydro generators, and two 400 hp turbines connected to two 288 kW vertical hydro generators. The plant's total capacity is 1,056 kW.

Water is delivered to and from the turbines by two 32 foot-long, 10 foot-diameter steel penstocks, and two 320 foot long brick tailraces, respectively.

2. *Proposed mitigation:* Since Holyoke only proposes to continue operating the project as in the past, with no new construction, Holyoke proposes no mitigative measures.

3. *There are no federal lands to be affected.*

4. *Alternatives to the existing project:*

a. *The Commission could issue an annual license.* Section 15(a) of the Federal Power Act, [16 U.S.C. §808](#) (a), provides for the issuance of annual licenses to the prior licensee if the license expires pending the relicensing determination.

[63,364]

Under this alternative, an annual license would continue to be issued to Holyoke. The annual license contains the same terms as the expired license, thereby maintaining the status quo.

b. *The federal government could take over the project.* An alternative to issuing a new license for continued operation of the project would be takeover of the project by the federal government. Such action can be recommended to Congress by the Commission on its own motion or upon recommendation of a federal department or agency, under the provisions of Section 14 of the Act. If the Commission determined, after notice and opportunity for hearing, that the United States should exercise its right to take over the project, the Commission would submit its recommendation to Congress with such information as it considers appropriate.

If the federal government were to take over the project, the project would be operated in coordination with the other hydro projects in the region just as it has in the past. The only difference would be that the federal government would market the power rather than the applicant.

c. *The Commission could issue a non-power license.* Section 15(b) of the Act, §808(b), authorizes the Commission to issue a license for nonpower use when the Commission "finds that in conformity with a comprehensive plan for improving or developing a waterway or waterways for beneficial public uses all or part of any licensed project should no longer be used or adapted for use for power purposes." A license that is granted by the Commission for nonpower use is temporary. When the Commission finds that a state, municipality, interstate agency, or another federal agency is authorized and willing to assume regulatory supervision of the lands and facilities included under the nonpower license and does so, the Commission shall thereupon terminate the nonpower license.

d. *The Commission could deny the license application.* Denial of the license application could lead to removal of the power facilities and removal of all project works.

D. Consultation and Compliance

1. Fish and wildlife agency consultation (Fish & Wildlife Coordination Act):

U.S. Fish & Wildlife Service: Yes

Massachusetts Department of Fisheries, Wildlife, and Recreational Vehicles: Yes

National Marine Fisheries Service: Yes

2. Section 7 consultation (Endangered Species Act):

a. *Listed species:* The endangered shortnose sturgeon has been observed in the mainstream Connecticut River in the project vicinity, but not in the canal system (letter from Gordon Beckett, Supervisor, U.S. Fish and Wildlife Service, Concord, New Hampshire, March 18, 1987).

b. Section 7 consultation is not required.

c. The existing trashracks with 1-inch-bar spacing would protect any sturgeon entering the canal from turbine-induced injury or mortality.

3. *Section 401 certification (Clean Water Act):* Holyoke petitioned the Commonwealth of Massachusetts, Executive Office of Environmental Affairs, Department of Environmental Quality Engineering, Division of Water Pollution Control for Water Quality Certification for this project on June 3, 1987. The Commonwealth granted the certification on August 24, 1987.

4. Cultural resource consultation (National Historic Preservation Act):

Massachusetts Historical Commission/State Historic Preservation Officer (SHPO): Yes.

National Park Service: Yes

The project is adjacent to the Holyoke Canal System, a property listed in the *National Register of Historic Places*. Since there would be no redevelopment, new construction, or changes to the exterior of the property, the project would not affect *National Register* or eligible properties, even though such properties are known to exist in or adjacent to the project area. The SHPO has concluded similarly, and has so indicated in its November 3, 1987 letter. Section 106 of the National Historic Preservation Act requires the Commission to consult with the Advisory Council on Historic Preservation in projects where there would be an effect. Therefore, further consultation--with either the Advisory Council or with any other agency or entity--is not required.

5. *Recreational consultation (Federal Power Act):* There are no U.S. owners to be consulted for this project.

National Park Service: Yes

Massachusetts Department of Fisheries, Wildlife, and Recreational Vehicles: Yes

6. *Wild and scenic rivers (Wild and Scenic Rivers Act):* No wild and scenic rivers would be affected by this project.

7. *Land and Water Conservation Fund lands and facilities (Land and Water Conservation Fund Act):* There are no Land and Water Conservation Fund lands and facilities in the project area; no such lands or facilities would be affected by this project.

[63,365]

E. Comments

1. *Public Notice Comments and Interventions:* The following agencies commented on Holyoke's application in response to the public notice dated September 30, 1988. No one filed any motions to intervene.

Commenting agencies *Date of letter*

Department of the

Interior November 23, 1988

Department of the Army, Corps of

Engineers, New England Division November 28, 1988

2. *Holyoke's Response:* Holyoke did not respond to the comments.

F. Affected Environment

1. The Connecticut River Basin (CRB):

a. Description of the CRB (See figure 3). The CRB, with a drainage area of 11,765 square miles, is the largest river basin in New England. Extending from the northernmost part of New Hampshire to Long Island Sound, the CRB has a maximum length in a north-south direction of about 280 miles and a maximum width of about 62 miles. The total drainage area of the basin is 11,765 square miles. The principal tributaries to the mainstem Connecticut River, by state, are: the Passumpsic, White, West, Ottauquechee, and Black Rivers in Vermont; the Ammonoosuc, Mascoma, Ashuelot, and Sugar Rivers in New Hampshire; the Millers, Deerfield, Chicopee, and Westfield Rivers in Massachusetts; and the Farmington River in Connecticut. This complex of rivers and tributaries constitutes one of the most extensively developed hydropower systems in the U.S. There is now a major effort by federal, state, and private sectors to restore Atlantic salmon to the CRB.

b. Licensed and exempted projects. There are 62 existing licensed projects and 38 exempted projects in the CRB, as of August 1, 1988.

c. Pending applications. There are 7 pending license applications in the CRB, as of August 1, 1988.

d. Target resources. A target resource is an important resource that may be cumulatively affected by multiple development within a basin. The staff based its selection of target resources on the regional significance and geographic distribution of the resource within the river basin. The only target resource in the CRB is anadromous fish. The anadromous fishery resource is described below in section F(3d). Impacts to anadromous fish are discussed in section G.

2. Description of the Project Locale: The project is located in a heavily industrialized setting between the first and second levels of the Holyoke Canal system. The climate is typical of inland Connecticut and Massachusetts with an average temperature of 49.8 degrees Fahrenheit and an average annual precipitation of 44.39 inches.

3. Descriptions of the resources in the project impact area (Source: City of Holyoke, Gas and Electric Department, application, exhibit E, unless otherwise indicated):

a. Geology and soils. The following bedrock and soils discussion is based on information provided by the applicant in response to staff requests (City of Holyoke Gas and Electric Department, 1988). Bedrock in the project area is interbedded sandstone, shale, conglomerate, and basaltic lava. The glacial till deposits that lie on the glaciated surface of the bedrock are in-turn overlain by varied glacial lake deposits. The original dry, sandy, surface soils in the project area have been highly altered by construction of the project and by fill and construction activities associated with urban development of the area.

b. Streamflow. Water flow in the first level canal is controlled at the canal gatehouse in order to supply necessary water to various hydropower and industrial facilities along the canal. The amount of flow entering the canal system ranges from no flow, when the gatehouse is shut down, to 5,155 cubic feet per second which is the maximum hydraulic capacity of the canal.

c. Water quality. The Connecticut River upstream of Holyoke dam is classified as Class B water by the Massachusetts Division of Water Pollution. Class B water is suitable for primary and secondary contact recreation and fish and wildlife resources. Class B water must have dissolved oxygen (DO) levels greater than 5.0 milligrams per liter (mg/l) and a pH between 6.5 and 8.0. The first level canal is classified as Class C. Class C water is suitable for secondary contact recreation and fish and wildlife resources and must have a DO level greater than 5.0 mg/l and a pH between 6.5 and 9.0 standard units. Water in the project area conforms to the state water quality standards.

d. Fisheries.

(1) Anadromous fish. Anadromous fish species found in the Connecticut River in the vicinity of the project include American shad, Atlantic salmon, blueback herring, sea lamprey, striped bass, shortnose sturgeon, and American eel (catadromous).

(2) Resident fish. Resident fish species found in the Connecticut River in the vicinity of the project include carp, channel catfish, smallmouth bass, largemouth bass, spottail shiner,

[63,366]

white perch, bluegill, rainbow trout, and brown trout.

e. Vegetation.

(1) *Upland hardwood forest.* Dominant species of this type found in the vicinity of the project include oak, maple, white pine, pitch pine.

(2) *Industrial area.* Dominant species of this type found in the vicinity of the project include grasses and ornamental shrubs.

f. Wildlife. Undeveloped land in the project area provides habitat for the gray squirrel, eastern cottontail rabbit, raccoon, muskrat, beaver, weasel, pheasant, and small field mammals (mice and voles). The industrial area is inhabited by English sparrows, starlings, robins, mockingbirds, Norway rats, raccoons, and eastern cottontail rabbits.

g. Cultural. There is a property listed on the *National Register of Historic Places* in the area of the project's potential environmental impact: it is the Holyoke Canal System, a contributing element in the Holyoke Canal Historic District. The portion of the canal in the project area was constructed between 1854 and 1857.

h. Visual quality. The project is in an industrial area. Its appearance is consistent with that of the surrounding buildings and structures.

i. Recreation. The immediate project area receives no significant recreational use because of its location in a highly industrialized area. No recreational facilities are located at the project. Recreational facilities including playgrounds, swimming pools, and a skating rink are available for use within walking distance of the project. The Connecticut River in the project vicinity is used for boating and fishing.

j. Land use. The project is entirely within the city. Land in the project area is primarily used for commercial, industrial, and residential purposes. The canal system is used for generating hydroelectric power at several locations.

k. Socioeconomics. The socioeconomic well-being of the area is influenced by industrial and urban development.

G. Environmental Issues and Proposed Resolutions

Cumulative impacts on migrating fish resulting from developing several hydropower projects in the CRB. In 1980, the U.S. Fish and Wildlife Service completed the plan for a major federal, state, and private sector effort to restore Atlantic salmon to the CRB, that addresses restoration efforts through the year 2005. Its goal is to establish and maintain, in the basin, a sport fishery, and, in selected tributaries, a spawning population. Its primary targets are Atlantic salmon and American shad. This effort has enhanced and would continue to enhance efforts to restore other anadromous fish such as blueback herring and striped bass.

Seaward migrating salmon smolts and juvenile and adult shad in the CRB pass numerous hydropower developments where they may become entrained and impinged. The more hydropower facilities outmigrating fish have to pass, the greater the fish losses. Among these hydropower facilities are the Holyoke dam and the canal system.

When river discharges are high and water is flowing over the Holyoke dam, migrating fish pass downstream with little or no delay (Northeast Utilities Service Company, 1984). On the other hand, outmigrating fish would be entrained into the canal system by high flows entering the canal if they arrive at the Holyoke dam when flashboards, permitting little or no spillage, are in place. Once in the canal, escape is very difficult. Fish can then be killed in the turbines of hydropower plants along the canal.

On February 26, 1988, the Commission ordered the HWPC to spill water over Holyoke dam when salmon smolts and juvenile and adult shad are migrating downstream (FERC, 1988). [HWPC is the licensee for the Hadley Falls Project (FERC Project No. 2004) and the entity that controls the water going into the canal.] Spilling water over the Holyoke dam allows migrating salmon smolts and juvenile and adult shad to pass safely downstream in the spill, instead of entering the canal system.

Holyoke and the HWPC have since implemented an economic dispatch agreement, in which the HWPC passes all flow downstream at the Holyoke dam and sells electricity, instead of water, to users along the canal when salmon smolts and juvenile and adult shad are migrating downstream. This arrangement prevents flow from entering the canal and attracting outmigrating anadromous fish, and minimizes the

number of outmigrating anadromous fish trapped in the canal, and the number of project-related impacts to fish in the CRB.

Continuing to operate the Number 1 Hydro Unit would not contribute to cumulative adverse impacts on migrating fish.

H. Environmental Impacts

1. *Assessment of impacts expected from the existing project (P), with Holyoke's proposed mitigation and any conditions set by a federal land management agency; the existing project with any additional mitigation recommended by the staff (Ps); and any action alternative considered (A):* The following symbols are used to generate three-character expressions to explain the degree (none, minor, moderate, or

[63,367]

major), type (adverse or beneficial), and duration (long-or short-term) of impacts (for example, the expression 1BL indicates a minor, beneficial, long-term impact).

O = None;	1 = Minor;
2 = Moderate;	3 = Major;
A = Adverse;	B = Beneficial;
L = Long-term;	S = Short term.

Resource	Impact		
	P	Ps	A
a. Geology-Soils	0		
b. Streamflow	0		
c. Water quality:			
Temperature	0		
Dissolved oxygen	0		
Turbidity and sedimentation	0		
d. Fisheries:			
Anadromous	0		
Resident	0		
e. Vegetation	0		
f. Wildlife	0		
g. Cultural:			

Archeological	0
Historical	0
h. Visual quality	0
i. Recreation	0
j. Land use	0
k. Socioeconomics	0

2. Recommended alternative (including proposed, required, and recommended mitigative measures) and reason for selecting the preferred alternative: Existing project. The power generated at this project is produced without any known adverse environmental impacts.

I. Unavoidable Adverse Impacts of the Recommended Alternative

There are no known adverse impacts.

J. Conclusion

Finding of No Significant Impact. Approval of the recommended alternative [H(2)] would not constitute a major federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement (EIS) will not be prepared.

K. Literature Cited

City of Holyoke, Gas and Electric Department. 1988. Application for minor license. Number 1 Hydro Unit, [FERC Project No. 2386-001](#), Massachusetts.

City of Holyoke, Gas and Electric Department. 1988. Additional information for the application for license for the Number 1 Hydro Unit, FERC Project No. 2386, Massachusetts. June 27, 1988.

Northeast Utilities Service Company. 1984. Review of cancelled Atlantic salmon smolt (*Salmo salar*), radiotelemetry study at the Holyoke dam, Massachusetts. Hartford, Connecticut. September 1984.

Federal Energy Regulatory Commission. 1988. Order amending license to require downstream fish passage facilities. [Project No. 2004-012](#). February 26, 1988 [[42 FERC ¶62,166](#)].

L. Preparer

James T. Griffin--Coordinator (B.A., Anthropology; Master of Public Administration)

Safety and Design Assessment

Number 1 Hydro Unit

[FERC Project No. 2386-001](#)

Dam Safety

The existing project does not include dams or other impounding structures. Hydraulic head is provided by the elevation difference between two canal levels in the city of Holyoke, Massachusetts. The canals are part of Project No. 2004, licensed to the Holyoke Water Power Company.

Project Design

The project consists of: (1) two intake openings in the Holyoke Second Level Canal; (2) two steel penstocks, each 10 feet in diameter and 36.5 feet long; (3) a brick powerhouse 38 feet wide and 50 feet long containing two 240-kilowatt (kW) and two 288-kW turbine-generator sets, adding up to a total capacity of 1,056 kW; (4) two tailrace tunnels 20 feet wide and 328.5 feet long; (5) 4.8-kilovolt (kV) generator leads that connect directly to the 4.8-kV City of Holyoke Gas and Electric Department's distribution system; and (6) appurtenant facilities.

Economic Evaluation

The staff has identified long-term levelized alternative energy costs in the region to be about 80 mills per kilowatthour (kWh). Since no new capital development costs have been proposed for the new license term, the cost of producing project energy is limited to operation, maintenance, interim replacements, insurance and other similar periodic production costs. These are estimated to total about \$21,700 per year, levelized, over a 30 to 50 year license period, equivalent to 6.6 mills/kWh.

With average annual energy generation of 3,292,000 kWh, the Number 1 Hydro plant produces the equivalent of \$263,000 per year in levelized energy values. The project remains a valuable resource for the licensee for the foreseeable future.

[63,368]

Water Resource Planning

The Number 1 Hydro Unit was put into service in 1902, was licensed on March 23, 1965, and the owner (City of Holyoke) filed for relicense on February 19, 1988. The original license terminates on February 28, 1991.

The project operates from water supplied by the Holyoke Water Power Company's Project No. 2004, originating at Hadley Falls Dam on the Connecticut River, and transmitted by way of the Holyoke canal system. The canal system also conveys the water back to the Connecticut River, making Number 1 Hydro an off-stream development. The diverted water is shared by several industrial and utility users located along the canals, and is allocated according to a system of water rights and exchanges.

Historically the project has produced about 3,292,000 kWh annually, giving it a plant factor of about 36 percent. Its maximum water use of 622 cfs is about 4.4 percent of the 14,100 cfs mean flow of the Connecticut River.

Because of its character as an off-stream development, surrounded by an urban industrial environment, the project does not affect other hydro power or storage sites upstream or downstream on the Connecticut River. Neither FERC's *Planning Status Report* for the Connecticut River Basin nor Massachusetts' *Water Quality Management Plan* (1982) mention the off-stream hydro plants in Holyoke as problem sources.

No federal or state agency has commented on the project as to its effect on navigation, flood control, irrigation or water supply.

The staff finds that installation of additional hydro power capacity would not be economically beneficial based upon a comparison with long-run rates of the least costly alternative source of energy.

The staff concludes that the relicensed Number 1 Hydro Unit will adequately utilize the available head and flow at the site and would not conflict with any other planned development.

Exhibits

The following portion of Exhibit A, and the following Exhibit F drawings are included as part of the license.

Exhibit A

One page titled "FERC No. 2386-Number 1 Hydro Exhibit A", filed on June 27, 1988, describing the project's mechanical, electrical and transmission equipment.

Exhibit F

Sheet No. FERC No. Description

F-1	2386-1	Building Layout
F-2	2386-2	Powerhouse Cross Section
F-6	2386-6	Tailrace Plans Profiles & Cross Sections

F-7 2386-7 Turbine-Generator Plan & Cross Section

F-5 2386-5 Intake Plan, Elevation & Cross Section

-- Footnotes --

[63,360]

Footnotes

- 1 See 10 FPC 1255 at 1257.
- 2 Connecticut River 1982 Water Quality Management Plan, June 1983, Massachusetts Division of Water Pollution Control; The Outdoor Heritage of Massachusetts, SCORP 1983-1988, December 1983, Massachusetts Department of Environmental Management; A Strategic Plan for the Restoration of Atlantic Salmon to the Connecticut River Basin, 1982, U.S. Fish and Wildlife Service.

[63,363]

- 1 Due to reproduction requirements, referenced figures are not included.

44 FERC ¶62,310, The City of Holyoke, Gas & Electric Department, , Project No. 2387-001, (Sep. 28, 1988)

<http://prod.resource.cch.com/resource/scion/document/default/%28%40%40FERC-FEG-02+44FERCP62310PAGE63416%29200996112911687DOC22760>

The City of Holyoke, Gas & Electric Department, , Project No. 2387-001
[63,416]

[¶62,310]

The City of Holyoke, Gas & Electric Department, , Project No. 2387-001
Order Issuing License (Minor Project)

(Issued September 28, 1988)

Fred E. Springer, Director, Office of Hydropower Licensing.

[63,417]

The City of Holyoke, Gas & Electric Department (Holyoke) filed a license application under Part I of the Federal Power Act (Act) to operate and maintain the constructed Number 2 Hydro Unit Project located on the First and Second Level Canals of the Holyoke Canal System off the Connecticut River, in Hampden County, Massachusetts.¹ The Connecticut River is a navigable waterway of the United States.²

The Holyoke Canal System takes water from the Connecticut River and discharges the water back into the Connecticut River at a point downstream. On July 5, 1949, the Commission issued a license to the Holyoke Water Power Company for Project No. 2004 which included therein the canal system as a part of the project works, but not the hydroelectric facilities owned by others and located along the canal system.

Notice of the application has been published. The comments filed by agencies and individuals have been fully considered in determining whether to issue this license. A motion to intervene was filed by the Holyoke Water Power Company in order to be a party in this proceeding.

Comprehensive Plans

Section 10(a)(2) of the Act requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans (where they exist) for improving, developing, or conserving a waterway or waterways affected by the project. The Commission provided an interpretation of comprehensive plans under section 10(a)(2)³ that is revised by the Order Granting Rehearing, issued April 27, 1988.⁴ In granting rehearing, the Commission instructed the Director, Office of Hydropower Licensing, to request the state and federal agencies to file plans they believe meet the revised guidelines. Until the process is completed, the staff will consider all available plans pursuant to section 10(a)(2).

The staff reviewed 3 plans that address various aspects of waterway management in relation to the proposed project.⁵ No conflicts were found.

Based upon a review of the agency and public comments filed in this proceeding, and on the staff's independent analysis, the Number 2 Hydro Unit Project is best adapted to a comprehensive plan for the Connecticut River.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the Act requires the Commission to include license conditions, based on recommendations of federal and state fish and wildlife agencies, for the protection, mitigation, and enhancement of fish and wildlife. The environmental assessment (EA) for the Number 2 Hydro Unit Project addresses the concerns of the federal and state fish and wildlife agencies; however, recommendations are not needed for continued operation of the project.

Summary of Findings

An EA ⁶ was issued for this project. Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the EA attached to this order. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if operated and maintained in accordance with the requirements of this license. Analysis of related issues is provided in the Safety and Design Assessment attached to this order.

The Director, Office of Hydropower Licensing, concludes that the project would not conflict with any planned or authorized development, and would be best adapted to comprehensive development of the waterway for beneficial public uses.

License Term

Because section 15 of the Act was waived for this project when it was previously licensed, this application is being treated as an original license application. The Commission's policy on license terms for constructed projects proposing no new construction is to set the license term at

[63,418]

30 years. ⁷ Accordingly, this license will expire 30 years from the effective date of this license.

The Director orders:

(A) This license is issued to the City of Holyoke, Gas & Electric Department (licensee), for a period of 30 years, effective the first day of the month in which this order is issued, to operate and maintain the Number 2 Hydro Unit Project. This license is subject to the terms and conditions of the Act, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, enclosed by the project boundary shown by exhibit G:

Exhibit	FERC No.	Showing
G-1	2384-26	Project area

(2) Project works consisting of: (1) an intake at the wall of the Holyoke first level canal; (2) two parallel 9-foot-diameter steel penstocks each 240 feet long; (3) one surge tank about 17 feet high and 10 feet in diameter; (4) a powerhouse 60 feet long, 40 feet wide and about 50 feet high, containing one vertical turbine-generator unit rated at 800 kW and 1,017 hp; (5) two parallel brick arched tailrace conduits, each 9 feet wide, 10 feet high and 120 feet long, discharging into the Holyoke second level canal; (6) one 4.8-kV transmission line, 800 feet long; and (7) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of Exhibits A and F recommended for approval in the attached Safety and Design Assessment.

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

(C) The exhibit G described above and those sections of exhibits A and F recommended for approval in the attached Safety and Design Assessment are approved and made part of the license.

(D) The following sections of the Act are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates to public notice and to the acceptance and expression in the license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to

depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15*; 16; 19; 20; and 22.

* At the expiration of this license, any license application filed, including the licensee's, will be treated as an original license application. The municipal preference provisions of section 7(a) of the Act will apply.

(E) This license is subject to the articles set forth in Form L-9 (October 1975) [reported at 54 FPC 1852], entitled "Terms and Conditions of License for Constructed Minor Project Affecting Navigable Waters of the United States", and the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective the first date of the month in which this license is issued:

For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 1,000 horsepower.

Article 401. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action

[63,419]

includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

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

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6)

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

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

[63,420]

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

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

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

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

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

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

be consolidated for consideration when revised exhibit G or K drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(G) This order is issued under authority delegated to the Director and is final unless appealed to the Commission by any party within 30 days from the issuance date of this order. Filing an appeal does not stay the effective date of this order or any date specified in this order. The licensee's failure to appeal this order shall constitute acceptance of the license.

Environmental Assessment
Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Project Review
August 26, 1988
Number 2 Hydro Unit
FERC Project No. 2387

A. Application

1. Application type: New minor license
2. Date filed with the Commission: March 31, 1987
3. Applicant: City of Holyoke, Massachusetts, Gas and Electric Department
4. Water body: Holyoke Canal; River basin: Connecticut
5. Nearest city or town: Holyoke, Massachusetts (see figure 1)
6. County: Hampden; State: Massachusetts

B. Purpose and Need for Action

1. Purpose

The project provides an estimated average annual generation of 4,243.4 megawatthours of electricity which is sold to the customers of the City of Holyoke, Gas and Electric Department.

2. Need for power

The power from the project is useful in meeting a small part of the need for power projected for the New England Power Pool area of the Northeast Power Coordinating Council (NPCC) region. Power generated at the project displaces fossil-fueled power generation in the NPCC region, thus conserving nonrenewable fossil fuels and reducing the emission of noxious byproducts caused by the combustion of fossil fuels.

C. Existing Project and Alternatives

1. Description of the existing project

The existing operating project commenced operation in 1938, was issued an initial license in 1965, which expired on March 31, 1988, and

[63,421]

is currently operating under annual license. The licensee has filed for a new license to continue operating the project. The project consists of the following existing facilities (see figure 2):

- a. an intake at the wall of the Holyoke first level canal;
- b. two parallel 9-foot-diameter steel penstocks each 240 feet long;
- c. one surge tank about 17 feet high and 10 feet in diameter;
- d. a powerhouse 60 feet long, 40 feet wide, and about 50 feet high, containing one vertical turbine-generator unit rated at 800 kilowatts and 1,017 horsepower;
- e. two parallel brick arched tailrace conduits, each 9 feet wide, 10 feet high, and 120 feet long, discharging into the Holyoke second level canal;
- f. one 4.8-kilovolt transmission line, 800 feet long; and
- g. appurtenant facilities.

2. Proposed mitigation

Because the applicant proposes to continue operating the project as in the past, with no new construction, the applicant proposes no mitigative measures.

3. Federal lands affected.

No.

4. Alternatives to the existing project.

a. Issuance of an annual license

Section 15(a) of the Federal Power Act, [16 U.S.C. §808](#) (a), provides for the issuance of annual licenses to the prior licensee if the license expires pending the relicensing determination. Under this alternative, an annual license would continue to be issued to the applicant. The annual license contains the same terms as the expired license, thereby maintaining the status quo.

b. Federal takeover

An alternative to issuing a new license for continued operation of the project would be takeover of the project by the federal government. Such action can be recommended to Congress by the Commission on its own motion or upon recommendation of a federal department or agency, under the provisions of Section 14 of the Act. If the Commission determined, after notice and opportunity for hearing, that the United States should exercise its right to take over the project, the Commission would submit its recommendation to Congress with such information as it considers appropriate.

If the federal government were to take over the project, the project would be operated in coordination with the other hydro projects in the region just as it has in the past. The only difference would be that the federal government would market the power rather than the applicant.

c. Issuance of nonpower license

Section 15(b) of the Act, 808(b), authorizes the Commission to issue a license for nonpower use when the Commission "finds that in conformity with a comprehensive plan for improving or developing a waterway or waterways for beneficial public uses all or part of any licensed project should no longer be used or adapted for use for power purposes." A license that is granted by the Commission for nonpower use is temporary. When the Commission finds that a state, municipality, interstate agency, or another federal agency is authorized and willing to assume regulatory supervision of the lands and facilities included under the nonpower license and does so, the Commission shall thereupon terminate the nonpower license.

d. Denial of license application

Denial of the license application could lead to removal of the power facilities and removal of all project works.

D. Consultation and Compliance

1. Fish and wildlife agency consultation (Fish & Wildlife Coordination Act).

- a. U.S. Fish & Wildlife Service (FWS): Yes.
- b. State(s): Yes.
- c. National Marine Fisheries Service (NMFS): Yes.

2. Section 7 consultation (Endangered Species Act).

a. Listed species: Present:

The endangered shortnose sturgeon has been observed in the mainstream Connecticut River in the project vicinity, but not in the canal system (letter from Gordon Beckett, Supervisor, U.S. Fish and Wildlife Service, Concord, New Hampshire, March 18, 1987).

b. Consultation: Not required.

Remarks: The existing trashracks with 1-inch-bar spacing would protect any sturgeon entering the canal from turbine-induced injury or mortality.

3. Section 401 certification (Clean Water Act).

Required; applicant requested certification on 3/13/87.

Status: Granted by the certifying agency on 3/30/87.

4. Cultural resource consultation (Historic Preservation Act).

a. State Historic Preservation Officer (SHPO): Yes.

b. National Park Service (NPS): Yes.

[63,422]

c. *National Register* status: Eligible or listed.

d. Council: Not required.

e. Further consultation: Not required.

5. Recreational consultation (Federal Power Act).

a. U.S. Owners: No.

b. NPS: Yes.

c. State(s): Yes.

6. Wild and scenic rivers (Wild and Scenic Rivers Act).

Status: None.

7. Land and Water Conservation Fund lands and facilities (Land and Water Conservation Fund Act).

Status: None.

E. Comments

1. The following agencies and entities provided comments on the application or filed a motion to intervene in response to the public notice dated 5/5/88. No motions to intervene were filed.

Commenting agencies

and other entities Date of letter

Department of the Interior 6/23/88

Department of the Army,

Corps of Engineers,

New England Division 6/9/88

2. The applicant did not respond to the comments or motion(s) to intervene.

F. Affected Environment

1. Connecticut River Basin

a. Description of the Connecticut River Basin (See figure 3)

The Connecticut River Basin (CRB), with a drainage area of 11,765 square miles, is the largest river basin in New England. Extending from the northernmost part of New Hampshire to Long Island Sound, the CRB has a maximum length in a north-south direction of about 280 miles and a maximum width of

about 62 miles. The total drainage area of the basin is 11,765 square miles. The principal tributaries to the mainstem Connecticut River, by state, are: the Passumpsic, White, West, Ottauquechee, and Black Rivers in Vermont; the Ammonoosuc, Mascoma, Ashuelot, and Sugar Rivers in New Hampshire; the Millers, Deerfield, Chicopee, and Westfield Rivers in Massachusetts; and the Farmington River in Connecticut. This complex of rivers and tributaries constitutes one of the most extensively developed hydropower systems in the U.S.

There is now a major effort by federal, state, and private sectors to restore Atlantic salmon to this basin.

b. There are 62 existing licensed projects and 38 exempted projects in the river basin, as of August 1, 1988.

c. There are 7 pending license applications in the river basin, as of August 1, 1988.

d. Target resources

A target resource is an important resource that may be cumulatively affected by multiple development within a basin. The staff based its selection of target resources on the regional significance and geographic distribution of the resource within the river basin.

The only target resource in the Connecticut River Basin is anadromous fish. The anadromous fishery resource is described below in section F(3d). Impacts to anadromous fish are discussed in section G.

2. General description of the project locale

The project is located in a heavily industrialized setting between the first and second levels of the Holyoke Canal system. The climate is typical of inland Connecticut and Massachusetts with an average temperature of 49.8 degrees Fahrenheit and an average annual precipitation of 44.39 inches.

3. Descriptions of the resources in the project impact area (Source: City of Holyoke, Gas and Electric Department, application, exhibit E, unless otherwise indicated)

a. Geology and soils

The following bedrock and soils discussion is based on information provided by the applicant in response to staff requests (City of Holyoke Gas and Electric Department, 1988). Bedrock in the project area is interbedded sandstone, shale, conglomerate, and basaltic lava. The glacial till deposits that lie on the glaciated surface of the bedrock are in-turn overlain by varied glacial lake deposits. The original dry, sandy, surface soils in the project area have been highly altered by construction of the project and by fill and construction activities associated with urban development of the area.

b. Streamflow

Water flow in the first level canal is controlled at the canal gatehouse in order to supply necessary water to various hydropower and industrial facilities along the canal. The amount of flow entering the canal system ranges from no flow, when the gatehouse is shut down, to 5,155 cubic feet per second which is the maximum hydraulic capacity of the canal.

c. Water quality

The Connecticut River upstream of Holyoke dam is classified as Class B water by the Massachusetts

[63,423]

Division of Water Pollution. Class B water is suitable for primary and secondary contact recreation and fish and wildlife resources. Class B water must have dissolved oxygen (DO) levels greater than 5.0 milligrams per liter (mg/l) and a pH between 6.5 and 8.0. The first level canal is classified as Class C. Class C water is suitable for secondary contact recreation and fish and wildlife resources and must have a DO level greater than 5.0 mg/l and a pH between 6.5 and 9.0 standard units. Water in the project area conforms to the state water quality standards.

d. Fisheries

Anadromous: Present.

Remarks: Anadromous fish species found in the Connecticut River in the vicinity of the project include American shad, Atlantic salmon, blueback herring, sea lamprey, striped bass, shortnose sturgeon, and American eel (catadromous).

Resident: Present.

Remarks: Resident fish species found in the Connecticut River in the vicinity of the project include carp, channel catfish, smallmouth bass, largemouth bass, spottail shiner, white perch, bluegill, rainbow trout, and brown trout.

e. Vegetation

Cover Dominant species

upland hardwood forest--oaks, maple, white pine, pitch pine

industrial area--grasses, ornamental shrubs

f. Wildlife

Undeveloped land in the project area provides habitat for the gray squirrel, eastern cottontail rabbit, raccoon, muskrat, beaver, weasel, pheasant, and small field mammals (mice and voles). The industrial area is inhabited by English sparrows, starlings, robins, mockingbirds, Norway rats, raccoons, and eastern cottontail rabbits.

g. Cultural

There are properties listed on, or eligible for listing on, the *National Register of Historic Places* in the area of the project's potential environmental impact.

Description:

The Holyoke Canal system is a contributing element in the Holyoke Canal Historic District. The district is listed on the *National Register of Historic Places*. The portion of the canal in the project area was constructed between 1854 and 1857.

h. Visual quality

The project is in an industrial area. Its appearance is consistent with that of the surrounding buildings and structures.

i. Recreation

The immediate project area receives no significant recreational use because of its location in a highly industrialized area. No recreational facilities are located at the project. Recreational facilities including playgrounds, swimming pools, and a skating rink are available for use within walking distance of the project. The Connecticut River in the project vicinity is used for boating and fishing.

j. Land use

The project is located in the City of Holyoke. Land in the project area is primarily used for commercial, industrial, and residential purposes. The canals are used for generating hydroelectric power.

k. Socioeconomics

The socioeconomic well-being of the area is influenced by industrial and urban development.

G. Environmental Issues and Proposed Resolutions

There is 1 issue(s) addressed below.

1. Cumulative impacts on migrating fish resulting from developing several hydropower projects in the CRB

In 1980, the U.S. Fish and Wildlife Service completed the plan for a major federal, state, and private sector effort to restore Atlantic salmon to the Connecticut River Basin, that addresses restoration efforts through the year 2005. Its goal is to establish and maintain, in the basin, a sport fishery, and, in selected tributaries, a spawning population. Its primary targets are Atlantic salmon and American shad. This effort has enhanced and would continue to enhance efforts to restore other anadromous fish such as blueback herring and striped bass.

Seaward migrating salmon smolts and juvenile and adult shad in the CRB pass numerous hydropower developments where they may become entrained and impinged. The more hydropower facilities outmigrating fish have to pass, the greater the fish losses. Among these hydropower facilities are the Holyoke dam and the canal system.

When river discharges are high and water is flowing over the Holyoke dam, migrating fish pass downstream with little or no delay (Northeast Utilities Service Company, 1984). On the other hand, outmigrating fish would be entrained into the canal system by high flows entering the canal if they arrive at the Holyoke dam when flashboards, permitting little or no spillage, are in place. Once in the canal, escape is very difficult. Fish can then be killed in the turbines of hydropower plants along the canal.

[63,424]

On February 26, 1988, the Commission ordered the Holyoke Water Power Company (HWPC) to spill water over Holyoke dam when salmon smolts and juvenile and adult shad are migrating downstream (FERC, 1988). HWPC is the licensee for the Hadley Falls Project (FERC Project No. 2004) and the entity that controls the water going into the canal. Spilling water over the Holyoke dam allows migrating salmon smolts and juvenile and adult shad to pass safely downstream in the spill, instead of entering the canal system.

Subsequently, the applicant and the HWPC have recently implemented an economic dispatch agreement, in which the HWPC passes all flow downstream at the Holyoke dam and sells electricity, instead of water, to users along the canal when salmon smolts and juvenile and adult shad are migrating downstream. This arrangement prevents flow from entering the canal and attracting outmigrating anadromous fish, and minimizes the number of outmigrating anadromous fish trapped in the canal, and the number of project-related impacts to fish in the CRB.

Therefore, continued operation of the Number 2 Hydro Unit would not contribute to cumulative adverse impacts on migrating fish.

H. Environmental Impacts

1. Assessment of impacts expected from the existing project (P), with the applicant's proposed mitigation and any conditions set by a federal land management agency; the existing project with any additional mitigation recommended by the staff (Ps); and any action alternative considered (A).

Assessment symbols indicate the following impact levels:

O = None; 1 = Minor; 2 = Moderate; 3 = Major; A = Adverse; B = Beneficial; L = Long-term; S = Short-term.

Resource	Impact				Resource	Impact		
	P	Ps	A			P	Ps	A
a. Geology-Soils	0				f. Wildlife	0		
b. Streamflow	0				g. Cultural:			
c. Water quality:					Archeological	0		
Temperature	0				Historical	0		
Dissolved								
oxygen	0				h. Visual quality	0		
Turbidity and								
sedimentation	0				i. Recreation	0		
d. Fisheries:					j. Land use	0		
Anadromous	0				k. Socioeconomics	0		
Resident	0							
e. Vegetation	0							

Chart [dash][dash] Assessment of environmental impacts expected from applicant's proposed project (P)

2. Recommended alternative (including proposed, required, and recommended mitigative measures):
Existing project.

3. Reason(s) for selecting the preferred alternative.

The power generated at this project is produced without any known adverse environmental impacts.

I. Unavoidable Adverse Impacts of the Recommended Alternative

There are no known adverse impacts.

J. Conclusion

Finding of No Significant Impact. Approval of the recommended alternative [H(3)] would not constitute a major federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement (EIS) will not be prepared.

[63,425]

K. Literature Cited

City of Holyoke, Gas and Electric Department. 1987. Application for minor license. Number 2 Hydro Unit, [FERC Project No. 2387-001](#), Massachusetts.

City of Holyoke, Gas and Electric Department. 1988. Additional information for the application for license for the Number 2 Hydro Unit, FERC Project No. 2387, Massachusetts. January 28, 1988.

Northeast Utilities Service Company. 1984. Review of cancelled Atlantic salmon smolt (*Salmo salar*), radiotelemetry study at the Holyoke dam, Massachusetts, Hartford, Connecticut. September 1984.

Federal Energy Regulatory Commission. 1988. Order amending license to require downstream fish passage facilities. [Project No. 2004-012](#). February 26, 1988.

L. List of Preparers (Name--Position title)

James T. Griffin--Archeologist (Coordinator)

Spencer Gakner--Ecologist

John Staples--Ecologist

Peter Leitzke--Geologist

Ann E. Mates--Environmental Protection Specialist

Mary Nowak--Editor

[63,426]

[Figure 1 Location of the proposed No 2 44FERCP62310PAGE63427 44FERCPAGE63427 Hydro Unit, MA](#)

[63,427]

[Figure 2 Location of project features for the proposed 44FERCP62310PAGE63428 44FERCPAGE63428 No 2 Hydro Unit, MA](#)

[63,428]

[Figure 3 Connecticut River Basin showing the 44FERCP62310PAGE63429 44FERCPAGE63429 location of the City of Holyoke, MA](#)

[63,429]

Safety and Design Assessment

Number 2 Hydro Unit

FERC Project No. 2387-001--Massachusetts

Dam Safety

The existing project does not include dams or other impounding structures. Hydraulic head is provided by the elevation difference between two canal levels in the City of Holyoke, Massachusetts. The canals are part of Project No. 2004 licensed to the Holyoke Water Power Company.

Project Design

The project consists of: (1) an intake at the wall of the Holyoke First Level Canal; (2) two parallel 9-foot-diameter steel penstocks, each about 240 feet long; (3) one surge tank about 17 feet high and 10 feet in diameter; (4) a powerhouse about 60 feet long, 40 feet wide and 50 feet high, equipped with one vertical turbine-generator unit rated at 1017 hp and 800 kW; (5) two parallel brick-arched tailrace conduits, each 9 feet wide, 10 feet high and about 120 feet long, discharging into the Holyoke Second Level Canal; (6) one 4.8-kV transmission line, 800 feet long, connecting to the City of Holyoke, Gas Electric Department's distribution system; and (7) appurtenant facilities.

Water Resources Planning

The Number 2 Hydro Unit Project was put into service in 1938, was licensed on March 24, 1965, and the owner (City of Holyoke) filed a license application on March 31, 1987. The original license terminated on March 31, 1988.

The project operates from water supplied by the Holyoke Water Power Company's Project No. 2004, originating at Hadley Falls Dam on the Connecticut River, and transmitted by way of the Holyoke canal system. The canal system also conveys the water back to the Connecticut River, making the Number 2 Hydro Unit Project an off-stream development. The diverted water is shared by several industrial and utility users located along the canals, and is allocated according to a system of water rights and exchanges.

Historically the project has produced about 4,243,400 kWh annually, giving it a plant factor of about 61 percent. Its maximum water use of 720 cfs is about 5.1 percent of the 14,100 cfs mean flow of the Connecticut River.

Because of its character as an off-stream development, surrounded by an urban industrial environment, the project does not affect other hydro power or storage sites upstream or downstream on the Connecticut River. Neither FERC's *Planning Status Report* for the Connecticut River Basin nor Massachusetts' *Water Quality Management Plan* (1982) mention the off-stream hydro plants in Holyoke as problem sources.

No federal or state agency has commented on the project as to its effect on navigation, flood control, irrigation or water supply.

The staff finds that installation of additional hydro power capacity would not be economically beneficial based upon a comparison with long-term rates of the least costly alternative source of energy.

The staff concludes that the Number 2 Hydro Unit Project will adequately utilize the available head and flow at the site and would not conflict with any other planned development.

Exhibits

The following portions of exhibit A, and the following exhibit F drawings are included as part of the license.

Exhibit A

One page titled "Exhibit A, FERC Project Number 2387--Number 2 Hydro", filed with the application for license on March 31, 1987, describing the project's mechanical, electrical and transmission equipment.

Exhibit F

Sheet	FERC No.	Description
No.		
F-1	2387-22	General Plan & Cross Section

F-2 2387-23 Cross Sections of Penstocks & Draft Tube

F-4 2387-24 Generator Plan & Elevation

F-8 2387-25 Turbine Cross Section

-- Footnotes --

[63,417]

Footnotes

- 1 On March 24, 1965, the Commission issued a license to Holyoke for this project. That license expired on March 31, 1988.
- 2 See 2 FPC 387 (1941).
- 3 [Order No. 481](#), 52 Fed. Reg. 39,905 (October 26, 1987), *FERC Statutes and Regulations* [¶30,773](#) (1987).
- 4 [Order No. 481-A](#) [*FERC Statutes and Regulations* [¶30,811](#)] (April 27, 1988).
- 5 Connecticut River 1982 Water Quality Management Plan, June 1983, Massachusetts Division of Water Pollution Control; The Outdoor Heritage of Massachusetts, SCORP 1983-1988, December 1983, Massachusetts Department of Environmental Management; A Strategic Plan for the Restoration of Atlantic Salmon to the Connecticut River Basin, 1982, U.S. Fish and Wildlife Service.
- 6 Because section 15 of the Act was waived in the original license for this project, the discussion of alternatives under sections C-4(a) and (c) of the EA is not relevant.

[63,418]

- 7 *Montana Power Company*, 56 FPC 2008 (1976).

44 FERC ¶62,309, The City of Holyoke, Gas & Electric Department, , Project No. 2388-001, (Sep. 28, 1988)

<http://prod.resource.cch.com/resource/scion/document/default/%28%40%40FERC-FEG-02+44FERCP62309PAGE63404%29200996112911656DOC22759>

The City of Holyoke, Gas & Electric Department, , Project No. 2388-001
[63,404]

[¶62,309]

The City of Holyoke, Gas & Electric Department, , Project No. 2388-001
Order Issuing License (Minor Project)

(Issued September 28, 1988)

Fred E. Springer, Director, Office of Hydropower Licensing.

The City of Holyoke, Gas & Electric Department filed a license application under Part I of the Federal Power Act (Act) to operate and maintain the constructed Number 3 Hydro Unit Project located on the Second Level Canal of the Holyoke Canal System off the Connecticut River, in Hampden County, Massachusetts. The Connecticut River is a navigable waterway of the United States.¹

The Holyoke Canal System takes water from the Connecticut River and discharges the water back into the Connecticut River at a point downstream. On July 5, 1949, the Commission issued a license to the Holyoke Water Power Company for Project No. 2004 which included therein the canal system as a part of the project works, but not the hydroelectric facilities owned by others and located along the canal system.

Notice of the application has been published. The comments filed by agencies and individuals have been fully considered in determining whether to issue this license. A motion to intervene was filed by the Holyoke Water Power Company in order to be a party in this proceeding.

Comprehensive Plans

Section 10(a)(2) of the Act requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans (where they exist) for improving, developing, or conserving a waterway or waterways affected by the project. The Commission provided an interpretation of comprehensive plans under section 10(a)(2)² that is revised by the Order Granting Rehearing, issued April 27, 1988.³ In granting rehearing,

[63,405]

the Commission instructed the Director, Office of Hydropower Licensing, to request the state and federal agencies to file plans they believe meet the revised guidelines. Until the process is completed, the staff will consider all available plans pursuant to section 10(a)(2).

The staff reviewed 3 plans that address various aspects of waterway management in relation to the proposed project.⁴ No conflicts were found.

Based upon a review of the agency and public comments filed in this proceeding, and on the staff's independent analysis, the Number 3 Hydro Unit Project is best adapted to a comprehensive plan for the Connecticut River.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the Act requires the Commission to include license conditions, based on recommendations of federal and state fish and wildlife agencies, for the protection, mitigation, and enhancement of fish and wildlife. The environmental assessment (EA) for the Number 3 Hydro Unit Project addresses the concerns of the federal and state fish and wildlife agencies; however, recommendations are not needed for continued operation of the project.

Summary of Findings

An EA ⁵ was issued for this project. Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the EA attached to this order. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if operated and maintained in accordance with the requirements of this license. Analysis of related issues is provided in the Safety and Design Assessment attached to this order.

The Director, Office of Hydropower Licensing, concludes that the project would not conflict with any planned or authorized development, and would be best adapted to comprehensive development of the waterway for beneficial public uses.

License Term

Because section 15 of the Act was waived for this project when it was previously licensed, this application is being treated as an original license application. The Commission's policy on license terms for constructed projects proposing no new construction is to set the license term at 30 years. ⁶ Accordingly, this license will expire on May 31, 2020.

The Director orders:

(A) This license is issued to the City of Holyoke, Gas & Electric Department (licensee), for a period of 30 years, effective June 1, 1990, to operate and maintain the Number 3 Hydro Unit Project. This license is subject to the terms and conditions of the Act, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, enclosed by the project boundary shown by exhibit G:

Exhibit	FERC No.	Showing
G-1	2388-28	Project area

(2) Project works consisting of: (1) an intake trashrack about 47 feet long and 11 feet high covering an opening in the Holyoke Second Level Canal; (2) two headgates about 11 feet square; (3) two low pressure brick penstocks each about 85 feet long and 93 square feet in cross section; (4) a reinforced concrete powerhouse about 42 feet long, 34 feet wide, and 28 feet high, housing one turbine-generator unit rated at 450 kW with an average head of 12.5 feet; (5) an open tailrace about 118 feet long, 29.7 feet wide, and 10 feet deep; (6) 4.8-kV generator leads that connect directly to the 4.8-kV area distribution system; and (7) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of Exhibits A and F recommended for approval in the attached Safety and Design Assessment.

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project and located within the project boundary, all portable property that may be employed in connection with the project and

[63,406]

located within or outside the project boundary, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The exhibit G described above and those sections of exhibits A and F recommended for approval in the attached Safety and Design Assessment are approved and made part of the license.

(D) The following sections of the Act are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates to public notice and to the acceptance and expression

in the license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15*; 16; 19; 20; and 22.

* At the expiration of this license, any license application filed, including the licensee's, will be treated as an original license application. The municipal preference provisions of section 7(a) of the Act will apply.

(E) This license is subject to the articles set forth in Form L-9 (October 1975) [reported at 54 FPC 1852], entitled "Terms and Conditions of License for Constructed Minor Project Affecting Navigable Waters of the United States", and the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective June 1, 1990:

For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 600 horsepower.

Article 401. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

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

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands

[63,407]

for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution

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

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

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

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

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

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

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

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

[63,408]

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(G) This order is issued under authority delegated to the Director and is final unless appealed to the Commission by any party within 30 days from the issuance date of this order. Filing an appeal does not stay the effective date of this order or any date specified in this order. The licensee's failure to appeal this order shall constitute acceptance of the license.

Environmental Assessment
Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Project Review
August 26, 1988
Number 3 Hydro Unit
FERC Project No. 2388

A. Application

1. Application type: New minor license
2. Date filed with the Commission: July 23, 1987
3. Applicant: City of Holyoke, Massachusetts, Gas and Electric Department
4. Water body: Holyoke Canal; River basin: Connecticut
5. Nearest city or town: Holyoke, Massachusetts (see figure 1)
6. County: Hampden; State: Massachusetts

B. Purpose and Need for Action

1. Purpose

The project provides an estimated average annual generation of 2,466 megawatthours of electricity which is sold to the customers of the City of Holyoke, Gas and Electric Department.

2. Need for power

The power from the project is useful in meeting a small part of the need for power projected for the New England Power Pool area of the Northeast Power Coordinating Council (NPCC) region. Power generated at the project displaces fossil-fueled power generation in the NPCC region, thus conserving nonrenewable fossil fuels and reducing the emission of noxious byproducts caused by the combustion of fossil fuels.

C. Existing Project and Alternatives

1. Description of the existing project

The existing operating project commenced operation in 1940 and was issued an initial license in 1965, which will expire on May 31, 1990. The licensee has filed for a new license to continue operating the project. The project consists of the following existing facilities (see figure 2):

- a. an intake trashrack about 47 feet long and 11 feet high covering an opening in the Holyoke Second Level Canal;
- b. two headgates about 11 feet square;

- c. two low pressure brick penstocks each about 85 feet long and 93 square feet in cross section;
- d. a reinforced concrete powerhouse about 42 feet long, 34 feet wide, and about 28 feet high, containing one turbine-generator unit rated at 450 kilowatts with an average head of 12.5 feet;
- e. an open tailrace about 118 feet long, 29.7 feet wide, and 10 feet deep;
- f. 4.8-kilovolt (kV) generator leads that connect directly to the 4.8 kV area distribution system; and
- g. appurtenant facilities.

2. Proposed mitigation

Because the applicant proposes to continue operating the project as in the past, with no new construction, the applicant proposes no mitigative measures.

3. Federal lands affected

No.

4. Alternatives to the existing project

a. Issuance of an annual license

Section 15(a) of the Federal Power Act, [16 U.S.C. §808](#) (a), provides for the issuance of annual licenses to the prior licensee if the license expires pending the relicensing determination. Under this alternative, an annual license would continue to be issued to the applicant. The annual license contains the same terms as the expired license, thereby maintaining the status quo.

b. Federal takeover

An alternative to issuing a new license for continued operation of the project would be takeover of the project by the federal government. Such action can be recommended to Congress by the Commission on its own motion or upon recommendation of a federal department or agency, under the provisions of Section 14 of the Act. If the Commission determined, after notice and opportunity for hearing, that the United States should exercise its right to take over the project, the Commission would submit

[63,409]

its recommendation to Congress with such information as it considers appropriate.

If the federal government were to take over the project, the project would be operated in coordination with the other hydro projects in the region just as it has in the past. The only difference would be that the federal government would market the power rather than the applicant.

c. Issuance of nonpower license

Section 15(b) of the Act, §808(b), authorizes the Commission to issue a license for nonpower use when the Commission "finds that in conformity with a comprehensive plan for improving or developing a waterway or waterways for beneficial public uses all or part of any licensed project should no longer be used or adapted for use for power purposes." A license that is granted by the Commission for nonpower use is temporary. When the Commission finds that a state, municipality, interstate agency, or another federal agency is authorized and willing to assume regulatory supervision of the lands and facilities included under the nonpower license and does so, the Commission shall thereupon terminate the nonpower license.

d. Denial of license application

Denial of the license application could lead to removal of the power facilities and removal of all project works.

D. Consultation and Compliance

1. Fish and wildlife agency consultation (Fish & Wildlife Coordination Act).

a. U.S. Fish & Wildlife Service (FWS): Yes.

b. State(s): Yes.

c. National Marine Fisheries Service (NMFS): Yes.

2. Section 7 consultation (Endangered Species Act).

a. Listed species: Present:

The endangered shortnose sturgeon has been observed in the mainstream Connecticut River in the project vicinity, but not in the canal system (letter from Gordon Beckett, Supervisor, U.S. Fish and Wildlife Service, Concord, New Hampshire, August 3, 1987).

b. Consultation: Not required.

Remarks: The existing trashracks with 1-inch-bar spacing would protect any sturgeon entering the canal from turbine-induced injury or mortality.

3. Section 401 certification (Clean Water Act).

Required; applicant requested certification on 5/12/87.

Status: Granted by the certifying agency on 7/14/87.

4. Cultural resource consultation (Historic Preservation Act).

a. State Historic Preservation Officer (SHPO): Yes.

b. National Park Service (NPS): Yes.

c. *National Register* status: Eligible or listed.

d. Council: Not required.

e. Further consultation: Not required.

5. Recreational consultation (Federal Power Act).

a. U.S. Owners: No.

b. NPS: Yes.

c. State(s): Yes.

6. Wild and scenic rivers (Wild and Scenic Rivers Act).

Status: None.

7. Land and Water Conservation Fund lands and facilities (Land and Water Conservation Fund Act). Status: None.

E. Comments

1. The following agencies and entities provided comments on the application or filed a motion to intervene in response to the public notice dated 3/31/88. No motions to intervene were filed.

Commenting agencies

and other entities

Date of letter
Department of the Interior 5/26/88

Department of the Army, Corps
of Engineers, New England

Division 5/17/88

U.S. Environmental Protection

Agency 6/1/88

2. The applicant did not respond to the comments or motion(s) to intervene.

F. Affected Environment

1. Connecticut River Basin

a. Description of the Connecticut River Basin (See figure 3)

The Connecticut River Basin (CRB), with a drainage area of 11,765 square miles, is the largest river basin in New England. Extending from the northernmost part of New Hampshire to Long Island Sound, the CRB has a maximum length in a north-south direction of about 280 miles and a maximum width of about 62 miles. The total drainage area of the basin is 11,765 square miles. The principal tributaries to the mainstem

Connecticut River, by state, are: the Passumpsic, White, West, Ottauquechee, and Black Rivers in Vermont; the Ammonoosuc, Mascoma, Ashuelot, and Sugar

[63,410]

Rivers in New Hampshire; the Millers, Deerfield, Chicopee, and Westfield Rivers in Massachusetts; and the Farmington River in Connecticut. This complex of rivers and tributaries constitutes one of the most extensively developed hydropower systems in the U.S.

There is now a major effort by federal, state, and private sectors to restore Atlantic salmon to this basin.

b. There are 62 existing licensed projects and 38 exempted projects in the river basin, as of August 1, 1988.

c. There are 7 pending license applications in the river basin, as of August 1, 1988.

d. Target resources

A target resource is an important resource that may be cumulatively affected by multiple development within a basin. The staff based its selection of target resources on the regional significance and geographic distribution of the resource within the river basin.

The only target resource in the Connecticut River Basin is anadromous fish. The anadromous fishery resource is described below in section F(3d). Impacts to anadromous fish are discussed in section G.

2. General description of the project locale

The project is located in a heavily industrialized setting between the first and second levels of the Holyoke Canal system. The climate is typical of inland Connecticut and Massachusetts with an average temperature of 49.8 degrees Fahrenheit and an average annual precipitation of 44.39 inches.

3. Descriptions of the resources in the project impact area (Source: City of Holyoke, Gas and Electric Department, application, exhibit E, unless otherwise indicated)

a. Geology and soils

The following bedrock and soils discussion is based on information provided by the applicant in response to staff requests (City of Holyoke Gas and Electric Department, 1988). Bedrock in the project area is interbedded sandstone, shale, conglomerate, and basaltic lava. The glacial till deposits that lie on the glaciated surface of the bedrock are in turn overlain by varied glacial lake deposits. The original dry, sandy, surface soils in the project area have been highly altered by construction of the project and by fill and construction activities associated with urban development of the area.

b. Streamflow

Water flow in the first level canal is controlled at the canal gatehouse in order to supply necessary water to various hydropower and industrial facilities along the canal. The amount of flow entering the canal system ranges from no flow, when the gatehouse is shut down, to 5,155 cubic feet per second which is the maximum hydraulic capacity of the canal.

c. Water quality

The Connecticut River upstream of Holyoke dam is classified as Class B water by the Massachusetts Division of Water Pollution. Class B water is suitable for primary and secondary contact recreation and fish and wildlife resources. Class B water must have dissolved oxygen (DO) levels greater than 5.0 milligrams per liter (mg/l) and a pH between 6.5 and 8.0. The first level canal is classified as Class C. Class C water is suitable for secondary contact recreation and fish and wildlife resources and must have a DO level greater than 5.0 mg/l and a pH between 6.5 and 9.0 standard units. Water in the project area conforms to the state water quality standards.

d. Fisheries

Anadromous: Present.

Remarks: Anadromous fish species found in the Connecticut River in the vicinity of the project include American shad, Atlantic salmon, blueback herring, sea lamprey, striped bass, shortnose sturgeon, and American eel (catadromous).

Resident: Present.

Remarks: Resident fish species found in the Connecticut River in the vicinity of the project include carp, channel catfish, smallmouth bass, largemouth bass, spottail shiner, white perch, bluegill, rainbow trout, and brown trout.

e. Vegetation

Cover Dominant species

upland hardwood forest--oaks, maple, white pine, pitch pine

industrial area--grasses, ornamental shrubs

f. Wildlife

Undeveloped land in the project area provides habitat for the gray squirrel, eastern cottontail rabbit, raccoon, muskrat, beaver, weasel, pheasant, and small field mammals (mice and voles). The industrial area is inhabited by English sparrows, starlings, robins, mockingbirds, Norway rats, raccoons, and eastern cottontail rabbits.

g. Cultural

There are properties listed on, or eligible for listing on, the *National Register of Historic Places* in the area of the project's potential environmental impact.

Description:

The Holyoke Canal system is a contributing element in the Holyoke Canal Historic District. The district is listed on the *National Register of*

[63,411]

Historic Places. The portion of the canal in the project area was constructed between 1854 and 1857.

h. Visual quality

The project is in an industrial area. Its appearance is consistent with that of the surrounding buildings and structures.

i. Recreation

The immediate project area receives no significant recreational use because of its location in a highly industrialized area. No recreational facilities are located at the project. Recreational facilities including playgrounds, swimming pools, and a skating rink are available for use within walking distance of the project. The Connecticut River in the project vicinity is used for boating and fishing.

j. Land use

The project is located in the City of Holyoke. Land in the project area is primarily used for commercial, industrial, and residential purposes. The canals are used for generating hydroelectric power.

k. Socioeconomics

The socioeconomic well-being of the area is influenced by industrial and urban development.

G. Environmental Issues and Proposed Resolutions

There is 1 issue addressed below.

1. Cumulative impacts on migrating fish resulting from developing several hydropower projects in the CRB

In 1980, the U.S. Fish and Wildlife Service completed the plan for a major federal, state, and private sector effort to restore Atlantic salmon to the Connecticut River Basin, that addresses restoration efforts through the year 2005. Its goal is to establish and maintain, in the basin, a sport fishery, and, in selected tributaries, a spawning population. Its primary targets are Atlantic salmon and American shad. This effort has enhanced and would continue to enhance efforts to restore other anadromous fish such as blueback herring and striped bass.

Seaward migrating salmon smolts and juvenile and adult shad in the CRB pass numerous hydropower developments where they may become entrained and impinged. The more hydropower facilities outmigrating

fish have to pass, the greater the fish losses. Among these hydropower facilities are the Holyoke dam and the canal system.

When river discharges are high and water is flowing over the Holyoke dam, migrating fish pass downstream with little or no delay (Northeast Utilities Service Company, 1984). On the other hand, outmigrating fish would be entrained into the canal system by high flows entering the canal if they arrive at the Holyoke dam when flashboards, permitting little or no spillage, are in place. Once in the canal, escape is very difficult. Fish can then be killed in the turbines of hydropower plants along the canal.

On February 26, 1988, the Commission ordered the Holyoke Water Power Company (HWPC) to spill water over Holyoke dam when salmon smolts and juvenile and adult shad are migrating downstream (FERC, 1988). HWPC is the licensee for the Hadley Falls Project (FERC Project No. 2004) and the entity that controls the water going into the canal. Spilling water over the Holyoke dam allows migrating salmon smolts and juvenile and adult shad to pass safely downstream in the spill, instead of entering the canal system.

Subsequently, the applicant and the HWPC have recently implemented an economic dispatch agreement, in which the HWPC passes all flow downstream at the Holyoke dam and sells electricity, instead of water, to users along the canal when salmon smolts and juvenile and adult shad are migrating downstream.

This arrangement prevents flow from entering the canal and attracting outmigrating anadromous fish, and minimizes the number of outmigrating anadromous fish trapped in the canal, and the number of project-related impacts to fish in the CRB.

Therefore, continued operation of the Number 3 Hydro Unit would not contribute to cumulative adverse impacts on migrating fish.

H. Environmental Impacts

1. Assessment of impacts expected from the existing project (P), with the applicant's proposed mitigation and any conditions set by a federal land management agency; the existing project with any additional mitigation recommended by the staff (Ps); and any action alternative considered (A).

Assessment symbols indicate the following impact levels:

O = None; 1 = Minor; 2 = Moderate; 3 = Major; A = Adverse; B = Beneficial; L = Long-term; S = Short-term.

[63,412]

Resource	Impact			Resource	Impact		
	P	Ps	A		P	Ps	A
a. Geology-Soils	0			f. Wildlife	0		
b. Streamflow	0			g. Cultural: Archeological	0		
c. Water quality: Temperature	0			Historical	0		
Dissolved oxygen	0			h. Visual quality	0		
Turbidity and sedimentation	0			i. Recreation	0		
d. Fisheries: Anadromous	0			j. Land use	0		
Resident	0			k. Socioeconomics	0		
e. Vegetation	0						

Chart [dash][dash] Assessment of environmental impacts expected from existing project (P)

2. Recommended alternative (including proposed, required, and recommended mitigative measures):
Existing project.

3. Reason(s) for selecting the preferred alternative.

The power generated at this project is produced without any known adverse environmental impacts.

I. Unavoidable Adverse Impacts of the Recommended Alternative

There are no known adverse impacts.

J. Conclusion

Finding of No Significant Impact. Approval of the recommended alternative [H(3)] would not constitute a major federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement (EIS) will not be prepared.

K. Literature Cited

City of Holyoke, Gas and Electric Department. 1987. Application for minor license. Number 2 Hydro Unit, [FERC Project No. 2387-001](#), Massachusetts.

City of Holyoke, Gas and Electric Department. 1988. Additional information for the application for license for the Number 2 Hydro Unit, FERC Project No. 2387, Massachusetts. January 28, 1988.

Northeast Utilities Service Company. 1984. Review of cancelled Atlantic salmon smolt (*Salmo salar*), radiotelemetry study at the Holyoke dam, Massachusetts, Hartford, Connecticut. September 1984.

Federal Energy Regulatory Commission. 1988. Order amending license to require downstream fish passage facilities. [Project No. 2004-012](#). February 26, 1988.

L. List of Preparers (Name--Position title)

James T. Griffin--Archeologist (Coordinator)

Spencer Gakner--Ecologist

John Staples--Ecologist

Peter Leitzke--Geologist

Ann E. Mates--Environmental Protection Specialist

Mary Nowak--Editor

[63,413]

[Figure 1 Location of the proposed No. 3 44FERCP62309PAGE63414 44FERCPAGE63414 Hydro Unit, Massachusetts](#)

[63,414]

[Figure 2 Location of project features for the proposed 44FERCP62309PAGE63415 44FERCPAGE63415 No. 3 Hydro Unit, Massachusetts](#)

[63,415]

[Figure 3 Connecticut River Basin showing the 44FERCP62309PAGE63416 44FERCPAGE63416 location of the City of Holyoke, MA](#)

[63,416]

Safety and Design Assessment

Number 3 Hydro Unit

FERC Project No. 2388-001

Dam Safety

The existing project does not include dams or other impounding structures. Hydraulic head is provided by the elevation difference between two canal levels in the City of Holyoke, Massachusetts. The canals are part of Project No. 2004, licensed to the Holyoke Water Power Company.

Project Design

The project consists of: (1) a trash rack about 47 feet long and 11 feet high covering an intake opening in the Holyoke Second Level Canal; (2) two headgates about 11 feet square each; (3) two parallel low pressure brick penstocks, each about 85 feet long and 93 square feet in cross section; (4) a reinforced concrete powerhouse about 42 feet long, 34 feet wide, and 28 feet high, equipped with one turbine-generator unit rated at 450 kilowatts (kW) with an average head of 12.5 feet; (5) an open tailrace about 118 feet long, 29.7 feet wide, and 10 feet deep; (6) 4.8-kilovolt (kV) generator leads that connect directly to the 4.8-kV City of Holyoke Gas and Electric Department's distribution system; and (6) appurtenant facilities.

Water Resources Planning

The Number 3 Hydro Unit was put into service in 1940, was licensed on March 23, 1965, and the owner (City of Holyoke) filed for relicense on July 23, 1987. The original license terminates on May 31, 1990.

The project operates from water supplied by the Holyoke Water Power Company's Project No. 2004, originating at Hadley Falls Dam on the Connecticut River, and transmitted by way of the Holyoke canal system. The canal system also conveys the water back to the Connecticut River, making Number 3 Hydro an off-stream development. The diverted water is shared by several industrial and utility users located along the canals, and is allocated according to a system of water rights and exchanges.

Historically, the project has produced about 2,466,000 kWh annually, giving it a plant factor of about 63 percent. Its maximum water use of 534 cfs is about 3.8 percent of the 14,100 cfs mean flow of the Connecticut River.

Because of its character as an off-stream development, surrounded by an urban industrial environment, the project does not affect other hydro power or storage sites upstream or downstream on the Connecticut River.

Neither FERC's *Planning Status Report* for the Connecticut River Basin nor Massachusetts' *Water Quality Management Plan* (1982) mention the off-stream hydro plants in Holyoke as problem sources.

No federal or state agency has commented on the project as to its effect on navigation, flood control, irrigation or water supply.

The staff finds that installation of additional hydro power capacity would not be economically beneficial based upon a comparison with long-term rates of the least costly alternative source of energy.

The staff concludes that the Number 3 Hydro Unit will adequately utilize the available head and flow at the site and would not conflict with any other planned development.

Exhibits

The following portions of Exhibit A, and the following Exhibit F drawings are included as part of the license.

Exhibit A

One page titled "FERC No. 2388--Number 3 Hydro Exhibit A", filed with the application for license on July 23, 1987, describing the project's mechanical, electrical and transmission equipment.

Exhibit F

Sheet	FERC No.	Description
No.		
F-1	2388-22	Powerhouse Elevations
F-2	2388-23	Powerhouse Cross Section
F-7	2388-24	Penstocks & Tailrace Plans Profiles & Cross Sections
F-8	2388-25	Turbine Floor Plan
F-9	2388-26	Turbine Pit & Draft Tube
F-13	2388-27	Turbine-Generator Cross Section

-- Footnotes --

[63,404]

Footnotes

- 1 See 2 FPC 387 (1941).
- 2 [Order No. 481](#), 52 Fed. Reg. 39,905 (October 26, 1987), *FERC Statutes and Regulations* [§30,773](#) (1987).
- 3 [Order No. 481-A](#), *FERC Statutes and Regulations* [§30,811](#) (April 27, 1988).

[63,405]

- 4 Connecticut River 1982 Water Quality Management Plan, June 1983, Massachusetts Division of Water Pollution Control; The Outdoor Heritage of Massachusetts, SCORP 1983-1988, December 1983, Massachusetts Department of Environmental Management; A Strategic Plan for the Restoration of Atlantic Salmon to the Connecticut River Basin, 1982, U.S. Fish and Wildlife Service.

- 5 Because section 15 of the Act was waived in the original license for this project, the discussion of alternatives under sections C-4(a) and (c) of the EA is not relevant.
- 6 *Montana Power Company*, 56 FPC 2008 (1976).

116 FERC ¶62,128
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

City of Holyoke Gas & Electric Department

Project No. 7758-004

ORDER ISSUING SUBSEQUENT LICENSE

(August 15, 2006)

INTRODUCTION

1. On February 25, 2005, pursuant to Part I of the Federal Power Act (FPA),¹ the City of Holyoke Gas & Electric Department (HG&E) filed an application for a subsequent license to continue to operate the existing 750-kilowatt (kW) Holyoke No. 4 Hydroelectric Project No. 7758. The project is located on the Holyoke Canal System, which is adjacent to the Connecticut River, in the City of Holyoke, Hampden County, Massachusetts.² The Holyoke No. 4 Project does not occupy federal land. As discussed below, I am issuing a subsequent license for the project.

BACKGROUND

2. The Commission issued the original license for the project on March 19, 1987, effective March 1, 1957,³ for a 50-year period expiring on February 28, 2007.

¹ 16 U.S.C. §§ 791a – 825r (2000).

² The project is located on the Holyoke Canal, which receives water from the Connecticut River, a navigable waterway of the United States. 2 FPC 380, 387 (1941).

³ 38 FERC ¶ 62,270 (1987). This project was required to have been licensed on March 4, 1941, the date when the Connecticut River was determined to be a navigable waterway of the United States. Therefore, when the Commission licensed the project in 1987, it backdated the license to 1957, consistent with Commission practice at that time, thus allowing the maximum possible license term (50 years), but giving the licensee 20 years to operate under the license before it expired.

3. Notice of application was published in the Federal Register on June 8, 2005. No protests or motions to intervene were filed.
4. On September 27, 2005, the Commission issued public notice that the project was ready for environmental analysis and solicited comments, recommendations, terms and conditions, and prescriptions. In response, comments were filed by the U.S. Department of the Interior (Interior).
5. An environmental assessment (EA) was prepared by Commission staff and issued on May 18, 2006. No comments were filed on the EA. The comments and recommendations have been fully considered in determining whether, and under what conditions, to issue this license.

PROJECT DESCRIPTION

6. The Holyoke No. 4 Project is located within the Holyoke Canal System, which contains 20 hydropower developments. Six of the developments, and the Holyoke Canal System itself, are licensed under the adjacent Holyoke Project No. 2004 (Hadley Falls Hydro Station).⁴ The other developments, including the Holyoke No. 4 Project, are licensed separately. However, the operation of the Holyoke No. 4 Project is dependent on the operation of the Holyoke Project No. 2004, as discussed below.
7. The Holyoke No. 4 Project facilities are located between the first and second levels of the three-level Holyoke Canal System. The project draws water from the first level and releases it into the second level. The Holyoke No. 4 Project consists of: (1) two 7-foot-diameter, 76-foot-long penstocks drawing water from the first level canal of the Holyoke Canal System into; (2) a powerhouse with two 375-kW generating units with a total installed capacity of 750 kW leading to; (3) two 13-foot-wide, 300-foot-long tailraces discharging into the second level canal; (4) a 25-foot-long, 4.8-kilovolt (kV) transmission line; and (5) appurtenant facilities.⁵ The proposed project boundary encloses all of the above facilities except the transmission line, but in this order I am requiring the inclusion of the transmission within the project boundary.

8. HG&E currently operates the Holyoke No. 4 Project only when sufficient flows are available in the first level of the canal. Flows into the Holyoke Canal System are regulated by HG&E through the operation of the Holyoke Project No. 2004 according to a

⁴ 88 FERC ¶ 61,186 (1999); and 111 FERC ¶ 61,106 (2005).

⁵ One of the generating units was destroyed in an October 2004 fire and is currently not operating.

Comprehensive Flow Plan (Flow Plan) and Comprehensive Canal Operations Plan (Canal Operations Plan), which were approved by the Commission on June 24, 2003, and January 11, 2006, respectively.⁶

9. Within the first level of the canal, HG&E prioritizes flows first to the Holyoke No. 2 Project (FERC No. 2387), located at the far west end of the first level and beyond the Holyoke No. 4 Project, in order to provide flow through as much of the first level as possible. Flows are next provided to the Holyoke No. 1 Project (FERC No. 2386), located between Holyoke No. 2 and Holyoke No. 4. As such, the Holyoke No. 4 Project is operated primarily during higher flow periods when both Holyoke No. 1 and No. 2 are operating or when those projects are out-of-service. If Holyoke No. 1 and No. 2 are out-of-service, HG&E uses the Holyoke No. 4 Project to pass flows from the first level to the second level of the canal system.

10. HG&E proposes to rehabilitate the damaged generating unit to its former 375-kW capacity, and to continue to operate the project consistent with the Canal Operations and Canal Flow Plans under the Holyoke Project No. 2004 license.

WATER QUALITY CERTIFICATION

11. Under section 401(a) (1) of the Clean Water Act (CWA),⁷ the Commission may not issue a license for a hydroelectric project unless the state water quality certifying agency either has issued a water quality certification (certification) for the project or has waived certification by failing to act on a request for certification within a reasonable period of time, not to exceed one year. Section 401(d) of the CWA provides that the certification shall become a condition of any federal license or permit that is issued.⁸

12. On February 24, 2006, HG&E requested a waiver of certification from the Massachusetts Department of Environmental Protection (Massachusetts DEP). By letter filed on April 19, 2006, the Massachusetts DEP waived certification for the project, explaining that the certification issued for Project No. 2004 and the Settlement

⁶ 103 FERC ¶ 62,178 (2003), and 114 FERC ¶ 62,017 (2006). Pursuant to Article 406 of Project No. 2004 license (see 111 FERC ¶ 61,106), HG&E filed a revised Flow Plan in Project No. 2004 on September 6, 2005, which is currently pending before the Commission. Holyoke No. 4 will of course be operated consistent with any revised Flow Plan for Project No. 2004.

⁷ 33 U.S.C. § 1341(a) (1) (2000).

⁸ 33 U.S.C. § 1341(d) (2000).

Agreement for the relicensing of that project “specify all the conditions necessary to meet State water quality standards for the Holyoke No. 4 Project.”

COASTAL ZONE MANAGEMENT ACT

13. Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA),⁹ the Commission cannot issue a license for a project within or affecting a state’s coastal zone unless the state CZMA agency concurs with the license applicant’s certification of consistency with the state’s CZMA program, or the agency’s concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant’s certification.

14. By electronic mail dated March 30, 2006, the Massachusetts Office of Coastal Zone Management stated that the activities associated with the project fall outside the geographical boundaries of the Massachusetts Coastal Zone¹⁰ and described in the Massachusetts Coastal Management Plan, and, therefore, are not subject to federal consistency review. Therefore, no consistency certification is required.

SECTION 18 FISHWAY PRESCRIPTIONS

15. Section 18 of the FPA¹¹ provides that the Commission shall require the construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate. By letter filed November 22, 2005, Interior requested that the Commission reserve its authority to require fishways. Consistent with Commission policy, Article 402 of this license reserves the Commission’s authority to require fishways that may be prescribed by Interior for the Holyoke No. 4 Project.

THREATENED AND ENDANGERED SPECIES

16. Section 7(a)(2) of the Endangered Species Act of 1973 (ESA),¹² requires federal agencies to ensure their actions are not likely to jeopardize the continued existence of

⁹ 16 U.S.C. § 1456(3)(A) (2000).

¹⁰ See Chapter 5: Massachusetts Coastal Regions and an Atlas of Resources, June 1, 1977.

¹¹ 16 U.S.C. § 811 (2000).

¹² 16 U.S.C. § 1536(a) (2000).

federally listed threatened and endangered species, or result in the destruction or adverse modification of their designated critical habitat.

17. The federally threatened bald eagle and Puritan tiger beetle, and the federally endangered dwarf wedgemussel and shortnose sturgeon are known to occur in the project area. However, the project does not provide habitat for the Puritan tiger beetle or the bald eagle; shortnose sturgeon are excluded from the Holyoke Canal System; and a recent survey of the Holyoke Canal System did not locate any dwarf wedgemussels.¹³ Therefore, relicensing the Holyoke No. 4 Project would not affect these species.

NATIONAL HISTORIC PRESERVATION ACT ISSUES

18. Under Section 106 of the National Historic Preservation Act (NHPA)¹⁴ and its implementing regulations,¹⁵ federal agencies are required to take into account the effect of any proposed undertaking on properties listed or eligible for listing in the National Register (defined as historic properties) and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking.

19. The Holyoke 4 project is within the Holyoke Canal Historic District, which is listed in the National Register of Historic Places, but the project structures have not been evaluated for their eligibility. By letter filed April 6, 2005, the Massachusetts State Historic Preservation Officer (SHPO) found that relicensing the Holyoke No. 4 Project would have no adverse effect on historic properties. The SHPO noted that if changes are proposed at Holyoke 4, the project is sufficiently connected to the Holyoke Project No. 2004 such that the procedures contained within the latter's Cultural Resources Management Plan¹⁶ (CRMP) will provide the SHPO the opportunity for review and comment.

20. The Project No. 2004 CRMP requires HG&E to consult with the SHPO and follow the *Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* to apply the National Register Criteria to properties that have not been previously evaluated for National Register eligibility and may be affected by an

¹³ Rare Mussel Species Survey Report for Holyoke Project, FERC No. 2004, filed March 24, 2006.

¹⁴ 16 U.S.C. § 470 *et seq.* (2000).

¹⁵ 36 C.F.R. Part 800 (2005).

¹⁶ The CRMP for the Holyoke Project No. 2004 was filed on September 8, 2000, and approved by the Commission on June 27, 2001.

undertaking, such as the generator replacement proposed by HG&E and required by Article 301. The EA notes, however, that the CRMP does not specifically include provisions for the Holyoke No. 4 Project facilities. Therefore, Article 403 of this license requires the licensee to use the procedures established in the CRMP to identify and protect historic resources and consult with the SHPO prior to conducting any alterations at the Holyoke No. 4 Project. This consultation satisfies the Commission's responsibilities under section 106 of the NHPA.

RECOMMENDATIONS OF FEDERAL AND STATE FISH AND WILDLIFE AGENCIES

21. Section 10(j)(1) of the FPA¹⁷ requires the Commission, when issuing a license, to include license conditions based on recommendations of federal and state fish and wildlife agencies submitted pursuant to the Fish and Wildlife Coordination Act,¹⁸ to "adequately and equitably protect, mitigate damages to, and enhance fish and wildlife, (including related spawning grounds and their habitat)" affected by the project. No section 10(j) recommendations were filed for the Holyoke No. 4 Project.

OTHER ISSUES

Project Operation

22. As stated, HG&E currently operates the Holyoke No. 4 Project only when sufficient flows are available in the first level canal according to the Canal Operations Plan for Project No. 2004, which specifies how flows are to be distributed throughout the three levels of the canal.

23. HG&E proposes no changes to project operation and would continue to operate the project in accordance with the Project No. 2004 Canal Operations Plan. The EA recommended licensing the project as proposed by HG&E to ensure that aquatic resources in the canal are protected during the license term. Accordingly, Article 401 of this license requires project operation in accordance with the Canal Operations Plan, the pertinent portions of which are attached to this license as Appendix A.

¹⁷ 16 U.S.C. § 803(j)(1) (2000).

¹⁸ 16 U.S.C. § 661 *et seq.* (2000).

Generator Rehabilitation

24. In October 2004, a fire damaged one of the project's generating units and rendered it unusable. HG&E proposes, and the EA recommends, rehabilitating the damaged generating unit to make use of the hydro potential of the site. Accordingly, Article 301 of this license requires a plan to rehabilitate and operate the damaged unit.

ADMINISTRATIVE CONDITIONS

A. Annual Charges

25. The Commission collects annual charges from licensees for administration of the FPA. Article 201 provides for the collection of funds for administration of the FPA. Under the regulations currently in effect, projects such as this with an authorized installed capacity of less than or equal to 1,500 kW are not assessed an annual charge.

B. Exhibit F Drawings

26. The Commission requires licensees to file sets of approved project drawings on microfilm and in electronic file format. Article 202 requires the filing of these drawings.

C. Exhibit G Drawings

27. The exhibit G drawings filed on September 1, 2005, do not meet the current Commission requirements. The exhibit G drawings, sheets 1 and 2, do not include a stamp by a Registered Land Surveyor, and sheet 2 does not show the 25-foot-long transmission line within the project boundary and three known reference points. Article 203 requires HG&E to file revised exhibit G drawings. The exhibit G drawings filed on September 1, 2005, are therefore not approved and are not made part of the license (see ordering paragraph (C)).

D. Use and Occupancy of Project Lands and Waters

28. Requiring a licensee to obtain prior Commission approval for every use or occupancy of project land would be unduly burdensome. Therefore, Article 404 allows the licensee to grant permission, without prior Commission approval, for the use and occupancy of project lands for such minor activities as landscape planting. Such uses must be consistent with the purposes of protecting and enhancing the scenic, recreational, and environmental values of the project.

STATE AND FEDERAL COMPREHENSIVE PLANS

29. Section 10(a)(2)(A) of the FPA,¹⁹ requires the Commission to consider the extent to which a hydroelectric project is consistent with federal and state comprehensive plans for improving, developing, or conserving waterways affected by the project.²⁰ Under section 10(a)(2)(A), staff identified and reviewed 9 federal and state comprehensive plans that are relevant to this project.²¹ No conflicts were found.

APPLICANT'S PLANS AND CAPABILITIES

30. In accordance with section 10 of the FPA,²² and the Commission's regulations, staff have evaluated HG&E's record as a licensee with respect to the following: (A) need for power; and (B) safe management, operation, and maintenance of the project.²³ I accept the staff's findings in each of the following areas.

A. Need for Power

31. The Holyoke No. 4 Project is located in the New England Power Pool region of the North American Electric Reliability Council (NERC). According to the NERC, demand for electric energy in the region is expected to increase at an average rate of 1.5 percent per year through 2014. Staff concludes that the project's power, low cost, displacement of nonrenewable fossil-fired generation, and contribution to the region's diversified generation mix will help meet the need for power in the region.

¹⁹ 16 U.S.C. § 803(a)(2)(A) (2000).

²⁰ Comprehensive plans for this purpose are defined at 18 CFR § 2.19 (2005).

²¹ The list of applicable plans can be found in section IX of the EA for this project.

²² 16 U.S.C. § 803 (2000).

²³ In order No. 513, the Commission exempted licensees of minor projects, such as HG&E, whose license waives sections 14 and 15 of the FPA, from the information requirements of 18 C.F.R. § 16.10 (2000). *See Hydroelectric Relicensing Regulations Under the Federal Power Act*, 54 *Fed. Reg.* 23756 (June 2, 1989) and 55 *Fed. Reg.* 10768 (March 23, 1990), FERC Statutes and Regulations, Regulations Preambles 1986-1990 ¶ 30,854 at 31,445 (May 17, 1989).

B. Safe Management

32. Staff have reviewed HG&E's management, operation, and maintenance of the Holyoke No. 4 Project and the project's operation reports and concludes that there is no reason to believe that HG&E cannot continue to safely manage, operate, and maintain these facilities under a subsequent license.

PROJECT ECONOMICS

33. In determining whether a proposed project will be best adapted to a comprehensive plan for developing a waterway for beneficial public purposes, the Commission considers a number of public interest factors, including the economic benefit of the project power. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp.*,²⁴ the Commission employs an analysis that uses current costs to compare the costs of the project and likely alternative power, with no forecasts concerning potential future inflation, escalation, or deflation beyond the license issuance date. The basic purpose of the Commission's economic analysis is to provide a general estimate of the potential power benefits and the costs of a project, and of reasonable alternatives to project power. The estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license.

34. In applying this analysis to the Holyoke No. 4 Project, staff have considered two options: a no action alternative and HG&E's proposal, as licensed herein. Under the no action alternative, without rehabilitating the damaged generator, the estimated average annual generation of the Holyoke No. 4 Project is 1,574 MWh, providing an annual power value of about \$84,000, or \$53.35/MWh.²⁵ The annual cost would be \$56,000, or \$35.56/MWh. To determine whether the proposed project is currently economically beneficial, staff subtracts the project's cost from the value of the power the project produces. Therefore, in the first year of operation, the project would cost \$28,000, or \$17.79/MWh less than the likely alternative cost of power.

35. As proposed by HG&E and licensed herein, including rehabilitating the damaged generator, the annual cost of the project would be about \$135,300, or \$42.97/MWh. The annual power value for the estimated annual generation of 3,148 MWh, would be

²⁴ 72 FERC ¶ 61,027 (1995).

²⁵ Our estimate of the cost of alternative power is based on the Energy Information Administration's (EIA) Annual Energy Outlook for 2005 and its supplemental data on the EIA Internet Homepage.

\$167,900, or \$53.35/MWh. Therefore, in the first year of operation, the project would cost \$32,700, or \$10.38/MWh less than the likely alternative cost of power.

36. In considering public interest factors, the Commission takes into account that hydroelectric projects offer unique operational benefits to the electric utility system (ancillary service benefits). These benefits include their capacity to provide almost instantaneous load-following response to dampen voltage and frequency instability on the transmission system, system-power-factor-correction through condensing operations, and a source of power available to help in quickly putting fossil-fuel-based generating stations back on line following a major utility system or regional blackout.

COMPREHENSIVE DEVELOPMENT

37. Sections 4(e) and 10(a) of the FPA²⁶ require the Commission to give equal consideration to the power development purpose 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. The decision to license this project, and the terms and conditions included herein, reflect such consideration.

38. The EA for the project contains background information, analysis of effects, and support for related license articles. I conclude based on the record of this proceeding, including the EA and the comments thereon, that licensing the Holyoke No. 4 Project as described in this order would not constitute a major federal action significantly affecting the quality of the human environment. The project will be safe if operated and maintained in accordance with the requirements of this license.

39. Based on our independent review and evaluation of the project, recommendations from the resource agencies and other stakeholders, and the no-action alternative, as documented in the EA, I have selected the Holyoke No. 4 Project as proposed by HG&E, and find that it is best adapted to a comprehensive plan for improving or developing the Connecticut River.

40. I selected this alternative because: (1) issuance of a subsequent license will serve to maintain a beneficial, dependable, and an inexpensive source of electric energy; (2) the required environmental measures will protect aquatic resources and historic properties; and (3) the 750 kilowatts of electric energy generated from this renewable resource will

²⁶ 16 U.S.C. §§ 797(e) and 803(a)(1).

continue to offset the use of fossil-fueled, steam-electric generating plants, thereby conserving nonrenewable resources and reducing atmospheric pollution.

LICENSE TERM

41. The Commission's general policy is to establish 30-year terms for projects with little or no redevelopment, new construction, new capacity, or environmental mitigation and enhancement measures; 40-year terms for projects with a moderate amount of such measures; and 50-year terms for projects with extensive measures. In this case, as explained in this order, given the relationship of this project to the Holyoke Project No. 2004, the term of this license will be such that it will expire at the same time as the Project No. 2004 license.²⁷ Therefore, the term of this license will be 32 years and 6 months, and will expire August 31, 2039, the expiration date of the Project No. 2004 license.

The Director orders:

(A) This license is issued to the City of Holyoke Gas & Electric Department (licensee) for a period of 32 years and 6 months, effective March 1, 2007, to operate and maintain the Holyoke No. 4 Project. This license is subject to the terms and conditions of the FPA, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interest in those lands, enclosed by the project boundary shown by the revised exhibit G drawings filed September 1, 2005.

(2) Project works consisting of: (1) two 7-foot-diameter, 76-foot-long penstocks drawing water from the first level canal of the Holyoke Canal System; (2) a powerhouse with two 375-kW generating units with a total installed capacity of 750 kW (one of the generating units was destroyed in an October 2004 fire and is currently not operating); (3) two 13-foot-wide, 300-foot-long tailraces discharging into the second level canal; (4) a 25-foot-long, 4.8-kV transmission line; and (5) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of exhibits A and F shown below:

²⁷ In issuing new and subsequent licenses, the Commission will coordinate the expiration dates of licenses to the maximum extent possible, to maximize future consideration of cumulative impacts at the same time in contemporaneous proceedings at relicensing. See 18 C.F.R. § 2.23 (2004).

Exhibit A: Pages A-5 and A-14 filed on February 25, 2005.

Exhibit F: The following exhibit F drawings filed on September 1, 2005.

<u>Exhibit F Drawings</u>	<u>FERC No. 7758-</u>	<u>Showing</u>
Sheet 1	1001	Plan and Section
Sheet 2	1002	Intake Details

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

(C) The exhibits A and F described above are approved and made part of this license. The exhibit G drawings filed as part of the application for license do not conform to Commission regulations and are not approved.

(D) The following sections of the FPA are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates to public notice and to the acceptance and expression in the license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15; 16; 19; 20; and 22.

(E) This license is subject to the articles set forth in Form L-9 (Revised October 1975), entitled "Terms and Conditions of License for Constructed Minor Project Affecting Navigable Waters of the United States," (*see* 54 FPC 1799 *et seq.*), and the following additional articles:

Article 201. Administrative Annual Charges. The licensee shall pay the United States annual charges, effective March 1, 2007, as determined in accordance with provisions of the Commission's regulations in effect from time to time, for the purposes of reimbursing the United States for the cost of administration of Part I of the Federal Power Act. The authorized installed capacity for that purpose is 750 kilowatts. Under the regulations currently in effect, projects with authorized installed capacity of less than or equal to 1,500 kilowatts will not be assessed annual charges.

Article 202. Exhibit F Drawings. Within 45 days of the effective date of this license, the licensee shall file the approved exhibit F drawings in aperture card and electronic file formats.

a) Three sets of the approved exhibit drawings shall be reproduced on silver or gelatin 35mm microfilm. All microfilm shall be mounted on type D (3-1/4" X 7-3/8") aperture cards. Prior to microfilming, the FERC Drawing Number (*e.g.*, P-1234-1001 through P-1234-####) shall be shown in the margin below the title block of the approved drawing. After mounting, the FERC Drawing Number shall be typed on the upper right corner of each aperture card. Additionally, the Project Number, FERC Exhibit (*e.g.*, F-1, etc.), Drawing Title, and date of this license shall be typed on the upper left corner of each aperture card.

Two of the sets of aperture cards shall be filed with the Secretary of the Commission, ATTN: OEP/DHAC. The third set shall be filed with the Commission's Division of Dam Safety and Inspections-New York Regional Office.

b) The licensee shall file two separate sets of exhibit drawings in electronic raster format with the Secretary of the Commission, ATTN: OEP/DHAC. A third set shall be filed with the Commission's Division of Dam Safety and Inspections-New York Regional Office. Exhibit F drawings must be identified as (CEII) material under 18 CFR §388.113(c). Each drawing must be a separate electronic file, and the file name shall include: FERC Project-Drawing Number, FERC Exhibit, Drawing Title, date of this license, and file extension in the following format [P-1234-####, F-1, Project Description, MM-DD-YYYY.TIF]. Electronic drawings shall meet the following format specification:

IMAGERY - black & white raster file
 FILE TYPE – Tagged Image File Format, (TIFF) CCITT Group 4
 RESOLUTION – 300 dpi desired, (200 dpi min)
 DRAWING SIZE FORMAT – 24" X 36" (min), 28" X 40" (max)
 FILE SIZE – less than 1 MB desired

Article 203. Exhibit G Drawings. Within 45 days of the effective date of this license, the licensee shall file, for Commission approval, revised exhibit G drawings enclosing all licensed project works, including the 25-foot-long, 4.8-kV transmission line necessary for operation and maintenance of the project. The revised exhibit G drawings must comply with sections 4.39 and 4.41 of the Commission's regulations.

Article 301. Rehabilitation of Damaged Generating Unit. Within 3 months of the effective date of this license, the licensee shall file for Commission approval a plan, with schedule, to rehabilitate and operate the damaged generating unit. The licensee shall

submit one copy to the Division of Dam Safety and Inspections-New York Regional Engineer and two copies to the Commission (one of these shall be a courtesy copy to the Director, Division Dam Safety and Inspections).

The Commission reserves the right to require changes to the plan. The plan shall not be implemented until the licensee is notified that the plan is approved. Upon approval, the licensee shall implement the plan according to the approved schedule, including any changes required by the Commission.

Article 401. Project Operation. The project shall operate in accordance with sections 2.0 and 3.0 (Appendix A of this license) of the Comprehensive Canal Operations Plan filed for the Holyoke No. 2004 Project on June 20, 2005, supplemented on October 11, 2005, and approved on January 11, 2006 (114 FERC ¶ 62,017), as that Plan may be modified from time to time.

Project operation may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement between the licensee and the Massachusetts Department of Fish and Wildlife and the U.S. Department of the Interior. If project operation is so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident.

Article 402. Reservation of Authority to Prescribe Fishways. Authority is reserved by the Commission to require the licensee to construct, operate, and maintain, or to provide for construction, operation, and maintenance of, such fishways as may be prescribed by the Secretary of the U.S. Department of the Interior under section 18 of the Federal Power Act.

Article 403. Cultural Resources Management Plan. Prior to rehabilitating the damaged generating unit at Holyoke No. 4 Project, the licensee shall follow the procedures provided in the Action Plan (section IV) of the Cultural Resources Management Plan (CRMP) for the Holyoke No. 2004 Project, filed September 8, 2000, as modified and approved by the Commission on June 27, 2001 (95 FERC ¶ 62,274).

If rehabilitation of the project is found to affect historic properties, the licensee shall prepare a plan and include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the Massachusetts State Historic Preservation Officer (SHPO), and specific descriptions of how the SHPO's comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the SHPO to comment and to make recommendations before filing the plan with the Commission for approval. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on

site-specific information. The licensee shall not commence rehabilitation of the damaged unit notified by the Commission that the plan is approved.

Article 404. Use and Occupancy. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters, and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy are consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancy, for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are (much of this needs to be removed): (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancements. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction; (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site; and (3) determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The

Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of, project lands for: (1) construction of new bridges or roads for which all necessary state and approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved exhibit R or approved report on recreational resources of an exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is 5 acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Energy Projects, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked exhibit G map may be used), the nature of the proposed use, the identity of any Federal or state agency official consulted, and any Federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

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

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

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

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

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

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

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to the filing. Proof of service on these entities must accompany the filing with the Commission

(G) This order is final unless a request for rehearing is filed within 30 days from the date of its issuance, as provided in section 313(a) of the FPA. The filing of a request for rehearing does not operate as a stay of the effective date of this license or of any other date specified in this order, except as specifically ordered by the Commission. The licensee's failure to file a request for rehearing shall constitute acceptance of this license.

J. Mark Robinson
Director
Office of Energy Projects

Form L-9
(October, 1975)

FEDERAL ENERGY REGULATORY COMMISSION

**TERMS AND CONDITIONS OF LICENSE FOR CONSTRUCTED
MINOR PROJECT AFFECTING NAVIGABLE
WATERS OF THE UNITED STATES**

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

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

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

Article 4. The project, including its operation and maintenance and any work incidental to additions or alterations authorized by the Commission, whether or not conducted upon lands of the United States, shall be subject to the inspection and

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

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

Article 6. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage,

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

Article 7. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 8. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

Article 9. The United States specifically retains and safeguards the right to use water in such amount, to be determined by the Secretary of the Army, as may be necessary for the purposes of navigation on the navigable waterway affected; and the operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Secretary of the Army may prescribe in the interest of navigation, and as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Secretary of the Army may prescribe in the interest of navigation, or as the Commission may prescribe for the other purposes hereinbefore mentioned.

Article 10. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 11. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 12. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 13. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and

adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 14. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon the request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 15. The Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 16. Material may be dredged or excavated from, or placed as fill in, project lands and/or waters only in the prosecution of work specifically authorized under the license; in the maintenance of the project; or after obtaining Commission approval, as appropriate. Any such material shall be removed and/or deposited in such manner as to reasonably preserve the environmental values of the project and so as not to interfere with traffic on land or water. Dredging and filling in a navigable water of the United States shall also be done to the satisfaction of the District Engineer, Department of the Army, in charge of the locality.

Article 17. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the

Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

Article 18. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

Article 19. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

Appendix A

The City of Holyoke Gas & Electric Department Comprehensive Canal Operations Plan Sections 2.0 and 3.0 Filed June 20, 2005

2.0 HOLYOKE CANAL SYSTEM

The Holyoke canal system consists of three levels, referred to as First, Second, and Third Level Canals (see Figure 1-1). The typical water surface elevation of each of the canals is 97.47 ft, 77.47 ft and 64.97 ft, respectively (NGVD). Each level of the canal system provides water for industrial use and hydropower generation. During mean flow conditions, the canal system is operated at various total discharges up to its 6,600 cfs hydraulic design capacity, with a total generation flow of approximately 6,000 cfs. Some distribution of flows between the various canal levels and project and non-project hydro stations on the canal is determined by long standing water use agreements. At all times the flow entering the canal system must be balanced with total canal flow returned to the river to maintain safe operating levels in the canal. Canal inflow is directed back to the river or to the next canal level through various generating stations, water conduits, overflow structures, and leakage.

There are a total of 20 hydroelectric generating stations currently in service on the Holyoke canal system (Table 2-1). The Hadley Falls station is located on the impoundment. The canal system begins with the canal gatehouse structure located between the Hadley Falls station and the western shore. The gatehouse discharges water into the First Level Canal, a subsystem about 6,500 ft long, running through the City of Holyoke. The No. 1 Overflow structure, which is located immediately downstream of the gatehouse, discharges water directly back into the river.

The First Level Canal discharges water into the Second Level Canal through nine generating stations located along its length; seven of these stations are operational.²⁸ The HG&E licensed projects (all operational) on the First Level Canal are: Boatlock, Beebe-Holbrook, and Skinner (all covered in FERC No. 2004); Holyoke 1 (FERC No. 2386); Holyoke 2 (FERC No. 2387); and Holyoke 4 (FERC No. 7758). The First Level Canal also includes two unlicensed projects - Aubin (also known as Anitec) and the out-of-service Parsons station - and the location of the former unlicensed Xidex station; none of these is owned or operated by HG&E. There is a downstream fish passage louver facility, which begins 554 ft downstream of the canal gatehouse. The louver is angled across the

²⁸ There is also a facility owned by Hart Top Manufacturing, which is used as process water and is not a generating facility.

canal and is 440 ft long. It ends at a bypass facility and pipe which transports migrating fish to the Hadley Station tailrace.

The Second Level Canal includes eleven in-service generating stations, the No. 2 Overflow structure that discharges into the Hadley Falls Station tailrace, the No. 3 Overflow, and a pipe that discharge to the Third Level Canal. The following stations on the Second Level Canal are located between the Second Level Canal and the Connecticut River about 3,500 ft north of the Boston & Maine Railroad bridge: Riverside (FERC No. 2004), Station No. 5 (FERC No. 10806), Crocker Mill A and B (FERC No. 2758), Crocker Mill C (FERC No. 2770), Albion Mill D (FERC No. 2766), Albion Mill A (FERC No. 2768), Mt. Tom Mill (FERC No. 2497), Nonotuck (FERC No. 2771), Gillmill A (FERC No. 2772), and Gillmill D (FERC No. 2775).²⁹ The Holyoke 3 station (FERC No. 2388) is located between the Second and Third Level Canals.

The Third Level Canal is supplied with water from the Holyoke 3 station and the No. 3 Overflow. It is about 4,000 ft in length, and is located largely at the low-lying southern end of the canal system in the City of Holyoke, mostly parallel to the bank of the Connecticut River. The Third Level Canal includes the No. 4 Overflow structure located between the canal and the Connecticut River. The Chemical (FERC No. 2004) and Sonoco (unlicensed) stations are located between the Third Level Canal and the Connecticut River about 3,400 ft south of the railroad bridge.³⁰

The Holyoke Canal District was listed in the National Register in 1980 and is eligible for listing as an historic district.

3.0 CANAL OPERATIONS PLAN

The Canal Operations Plan details HG&E's proposed methods to: (1) release and circulate the required 400 cfs continuous minimum flow through the canal system downstream of the louver bypass; and (2) achieve and maintain the minimum canal flow and protective requirements for aquatic resources, including mussels during canal maintenance drawdowns.

²⁹ All of these stations are owned by HG&E. As noted above, the Crocker Mill A and B, Crocker Mill C, Albion Mill D, Albion Mill A, Mt. Tom Mill, Nonotuck, Gillmill A, and Gillmill D stations were acquired by HG&E from Harris Energy and Realty Coiporation, and are jointly referred to as "the Harris Projects." Further, as noted above, Station No. 5 has been recently re-acquired by HG&E.

³⁰ Only the Chemical station is owned by HG&E.

3.1 Canal Operations and Flow Releases

Minimum project flows for the Holyoke Project, including flows into the canal system, are detailed in LA 406 from the Settlement Agreement and WQC Condition 12. HG&E's plan to provide minimum flows for the entire Holyoke Project is detailed in the COFP, which was developed in conjunction with this CCOP. Both LA 406 and the WQC call for a year-round continuous minimum flows of 400 cfs downstream of the louver bypass. As reflected in LA 406(e), this minimum canal flow is assigned the highest priority of any minimum flow, including flows into the bypass reach.

The Holyoke Project Canal system is typically operated by continuously maintaining the First Level Canal at Elevation 97.47 ft (NGVD) except during drawdowns, inspections, and emergencies. The number of open headgates, positions of each headgate, and headpond elevations, are used to regulate the amount of water entering the canal to maintain the canal system at a constant level. The position of the 12 headgates and headpond elevations are continuously monitored by the gatehouse operator, adjusted as necessary to maintain a constant canal elevation.

Water from the First Level Canal is discharged into the Second Level Canal or attraction water gates and louver bypass gates utilized to operate upstream and downstream fish passage facilities. Water in the Second Level Canal is discharged to either the Third Level Canal or directly to the river through turbines or canal drain gates.

Estimates of water flow through the canal turbines have been derived using turbine manufacturer data and/or correlating generation to hydraulic flows for the turbines on the canal system. All canal generation is monitored by the gatehouse operator and recorded hourly in a log. Drain and feed gate positions on the canal system are, and will continue to be, monitored and recorded hourly by the gatehouse operator along with the volume of water flow that passes through the gatehouse gates.

HG&E developed a series of matrices detailing project operations (including dispatch of the canal units) over a range of flows for habitat flows, and the Spring and Fall Bypass Zone of Passage (ZOP) flows for upstream and downstream fish passage seasons, pursuant to LA 406(a) under the Settlement. These matrices are included below as Figures 3-1, 3-2, and 3-3. In developing the project operations matrices, HG&E's goal was to dispatch the canal units in a manner that would maximize the amount and distribution of water throughout the canal system. Specific details on canal station dispatch are described below.

3.1.1 Spring Passage

During spring fish passage season (generally April 1- July 15), while water is first dispatched to the canal system, the amount that is allocated depends on the river flow (Figure 3-1). When river flows are below 5,400 cfs, 400 cfs will be circulated in the First Level Canal below the louver bypass and will normally be discharged through HG&E's Holyoke 2 station into the Second Level Canal. From there, the water will pass through the Holyoke 3 or No. 3 Overflow and Riverside Stations. Flow will split approximately evenly between the two stations, which in turn will maximize flow distribution throughout the Second Level Canal. Water discharged from Holyoke 3 will enter the Third Level Canal, while water discharged from Riverside Station will flow back into the Connecticut River. In the Third Level Canal, water will be discharged through the Chemical station, Sonoco station, and/or the No. 4 Overflow back into the river.

When river flows reach approximately 5,400 cfs, water in the canal system will increase from 400 cfs to 2,400 cfs. Station dispatch is as noted above, but on the First Level Canal, Parsons (or other units under HG&E control), Aubin and Boatlock stations are also brought online, if the stations are operational. On the Second Level Canal, Station No. 5 and all eight Harris Projects are brought online as a single block.

When river flows reach approximately 16,000 cfs, flow in the canal system will be increased to a maximum of 6,600 cfs is reached - 6,000 cfs for generation and 600 cfs for fish passage operation. At this point all available generating stations on all three canal levels are able to generate.

3.1.2 Fall Passage

During fall fish passage season (generally September 16 - November 15), water is first dispatched to the canal system; the amount that is allocated will again depend on the river flow (Figure 3-2). When river flow is below 15,940 cfs, 400 cfs of water will be passed into the First Level Canal and be dispatched through HG&E's Holyoke 2 station into the Second Level Canal. From there, water will be passed through the Holyoke 3 and Riverside stations. Water from Holyoke 3 will enter the Third Level Canal, while flows from Riverside will be discharged into the Connecticut River. In the Third Level Canal flow will pass through the Chemical station and/or the No. 4 Overflow back into the river.

When river flows reach approximately 16,000 cfs, flows in the canal system will be increased to the maximum of 6,600 cfs - 6,000 cfs for generation and 600 cfs for fish passage operation. At this point, all available generating stations on all three canal levels are able to generate.

3.1.3 Habitat Flows

During the period of habitat flows (generally July 15 - September 15, and November 16 - March 31), water is again first dispatched to the canal system and the amount that is allocated depends on the river flow (Figure 3-3). When river flows are less than 11,400 cft, 400 cfs will enter the First Level Canal and is dispatched through HG&E's Holyoke 2 station into the Second Level Canal. From there, water is passed through the Holyoke 3 and Riverside stations. Water from Holyoke 3 enters the Third Level Canal, while water from Riverside discharges back into the Connecticut River. In the Third Level Canal, water is passed through the Chemical station, Sonoco station, and/or the No.4 Overflow back into the river.

When river flows reach 11,300 cfs, flow in the canal system is increased from 400 cfs to 2,200 cfs. Station dispatch is as noted above, but on the First Level Canal Parsons/Aubin and Boatlock Station are also brought online. On the Second Level Canal Station No. 5 and all eight Harris Projects are brought online as a single block.

When river flows reach approximately 15,000 cfs, flows in the canal system will be increased to a maximum of 6,000 cfs. At this point all available generating stations on all three canal levels are able to generate.

3.2 Canal Minimum Flow Plan

As noted above, LA 406 and the WQC requires that a minimum flow of 400 cfs be passed through the canal system downstream of the louver bypass system. Upstream of the louver bypass system, 440 cfs is required at the No. 1 Overflow during spring and fall upstream fish passage. The 440 cfs is the maximum flow for the upstream fish passage attraction facilities: up to 200 cfs at the spillway entrance and up to 120 cfs at each tailrace entrance. During downstream fish passage, 150 cfs bypass flow is required for the louver bypass system.

LA 406 and the WQC assigns the canal minimum flow the highest priority of any other flow release, including minimum flows into the bypass reach. Under low flow conditions, therefore, the first 400 cfs available will be passed through the canal system, as detailed in HG&E's Low Flow Contingency Plan, included in the COFP.

3.2.1 Canal Flow

After acquiring the project in December 2001, HG&E noticed that a significant amount of leakage existed in the canal system. Tests were performed to measure the leakage and HG&E has discovered approximately 300 cfs of leakage in the canal system. Most of the leakage appears to originate downstream of the louver bypass facility. The

volume of the water that is leaking through the canal system was determined by shutting down all generation on the canal and observing the headgate settings.

Since canal flow receives the highest priority, this leakage is significant. If leakage were not accounted for, during low flow conditions, the first 700 cfs would be diverted from the river to the canal system before discharging any water to the bypass reach. Including leakage in calculating minimum flows in the canal system provides more water in the bypass reach.

After reviewing this issue with the stakeholders, HG&E developed a study plan to verify flow distribution using the leakage component to achieve the 400 cfs minimum flow. The primary objectives of this study was to (1) determine flow patterns in Holyoke Project canal system, and (2) measure water quality in the canal system downstream of the louver bypass. To confirm that water is moving through the three levels of the canals, HG&E took field measurements to determine detectable water movement at various locations in each canal. Leakage or water movement in the canal system primarily occurs as water passes through a unit's wicket and/or headgates or through overflow waste gates. Measurements were taken at various roadway and footbridge crossings located throughout the canal system to record detectable velocity.

The study was originally performed in the summer of 2002, and based upon a review of the results, stakeholders agreed to allow leakage to be used to meet the canal minimum flow requirement. The results of the study showed that a total canal headgate opening of 60 inches provides 400 cfs of inflow to the canal, and that the existing inter-canal leakage in the system provided enough flow distribution so that detectable water velocities were measured at every sampling point in the study. To provide a means of compliance tracking, HG&E installed an Acoustic Doppler Current Profiler (ADCP) near Cabot Street nearly two-thirds of the way down the First Level Canal. The 2002 study results and conclusions were reflected in the Permanent Canal Minimum Flow Plan filed with FERC on June 30, 2004.

To ensure that the ADCP was calibrated properly, in the fall of 2004, HG&E recreated the minimum flow study that was performed in 2002. As described in the June 2004 Permanent Canal Minimum Flow Plan (at page 9), "[t]his allowed HG&E to document the exact discharge passing through the downstream end of the First Level Canal for future compliance. HG&E also observed the relative distribution of flows between the Second and Third Level Canals to verify acceptable conditions (i.e., that the majority of the flow remains in the Second Level Canal. The velocity meter at the Cabot Street Bridge was correlated to measure flow corresponding to the flow in the downstream end of the First Level Canal during the calibration exercise. The meter was tied to HG&E's gatehouse supervisory system, allowing constant monitoring and documentation of flow distribution within the canal system."

A total of 400 cfs was allowed into the canal (measured via canal headgate openings), and the velocity sampling points were again measured to prove that there was detectible water velocities throughout the canal system (see Figure 3.4). During this time, the portion of the canal near the ADCP was gauged to calculate the flow passing the sensor at that time. The reading from the ADCP and the gauging of the canal showed a flow of 111 cfs, a variance of only 5% from the calculated flow from the gauging. This variance is most likely due to irregular velocity paths at low flows in the canal.

The remaining 289 cfs of the 400 that entered the canal through the headgates passed through to the Second Level Canal via leakage paths between Boatlock Station and the sensor near Cabot Street.

3.2.2 Compliance Measures and Documentation

In accordance with LA 406(c)(1) and the WQC, HG&E will provide 400 cfs downstream of the louver bypass. This flow will be provided continuously, year-round, except during canal drawdown situations. The 400 cfs will be distributed through the canal system downstream of the louver bypass system via a combination of leakage and/or generation. In the future the amount of leakage may change as holes (wicket gate, headgate openings, overflow gate leakage, etc.) in the canal system, which may end up blocked and no longer leaking, or flow leaking through a faulty gate that suddenly closes and no longer leaks. For that reason, minimum flow in the canal system will be verified by maintaining a minimum flow 111 cfs at the ADCP. It has been shown that as long as 111 cfs passes the sensor near Cabot Street, there is adequate flow distribution throughout all three levels of the canal.

Compliance will be documented by maintaining logs of the readings of the canal flow sensor by Cabot Street on the First Level Canal. These readings are taken on a real-time basis, and are saved to the HG&E computer system in hourly increments.

As further stated in the Permanent Canal Minimum Flow Plan (filed in June 2004, at page 9): “As provided for under Section 4.3(c) of the Settlement, if significant modifications are made by HG&E or any other entity on the canal system that could change leakage or the distribution of flow in the canal system, HG&E will evaluate the magnitude and distribution of flows in the canal system, and then, in consultation with the stakeholders, will propose to MADEP a revision to the permanent canal system minimum flow compliance measures set forth herein, as necessary to achieve the resource management objectives and the minimum flow requirements.”

3.3 Need and Frequency of Drawdowns

WQC Condition 13(d) contains a provision to evaluate “the frequency and necessity of canal drawdowns.” Canal drawdowns are necessary to maintain facilities in the three-level system to ensure continued safe operation of the canal, the generating units, and fish passage facilities. HG&E typically performs two drawdowns each year, the first in the spring and the second in the fall.

The spring outage usually lasts one or two days and the longer fall outage typically lasts five to seven days. The spring drawdown has two purposes: (1) to prepare for the spring freshet via cleaning various structures and performing any emergency repairs, and (2) to inspect the canal system infrastructure and develop a scope of work for the fall drawdown. During the fall drawdown, HG&E typically performs maintenance to the gatehouse, four masonry canal overflows, sixteen active flow control gates, approximately four and one half (4.5) miles of canals (including eight miles of canal walls), the louver facility on the First Level Canal, and 31 active water wheel installations (see Table 2-1).

Based on the spring drawdown, HG&E will develop a scope of work, plan, and schedule the fall outage. To the extent possible, HG&E will include maintenance work planned by other owners on the canal system.

3.4 Canal Drawdown Procedure

HG&E will attempt to reasonably expedite work performed during future drawdowns, and will attempt to undertake such work in a manner that least impacts aquatic resources. Pursuant to LA 406(d)(2)(C) and Section 4.3(e) of the Settlement, HG&E will notify all canal water users and resource agencies prior to any scheduled (i.e., non-emergency) canal system outage. Below are HG&E’s drawdown procedures for the First and Second Level Canals.

3.4.1 Permanent Canal System Outage Plan

Pursuant to LA 406(d) and Section 4.3 (e) of the Settlement Agreement, HG&E describes herein its permanent canal system drawdown procedures. HG&E will attempt to reasonably expedite work performed during future drawdowns, and will attempt to undertake such work in a manner that least impacts aquatic resources. HG&E will follow the procedures outlined below to maintain whatever flow is possible during the drawdowns. Below are HG&E’s drawdown procedures for the First and Second Level Canals.

3.4.2 First Level Canal

Stakeholders have expressed three concerns with conditions in the First Level Canal during drawdowns: (1) watering of mussel habit, (2) removal of sediment in front of Boatlock Station, and (3) placement of heavy equipment in the canal. The following discussion reiterates the measures described in the mussels section of the Threatened and Endangered Species Protection Plan (T&E Plan, as approved by FERC on June 6, 2003; 103 FERC ¶ 62,131) at Sections 5.1 (Habitat Enhancement) and 5.4.1 (First Level Canal Drawdown).

Following recommendations from USFWS and Trout Unlimited (TU) at the June 14 and 27, 2002 meetings (Appendix A), HG&E has attempted to mitigate any effects that may be caused by the dewatering of the First Level Canal by building a weir at the beginning of that canal just upstream of the railroad bridge. The weir spans the entire width of the canal, and is approximately three feet high, maintaining watered conditions approximately 930 ft into the First Level Canal. The result in wetted area is approximately 0.85 acres.

Another concern of the stakeholders was the practice of the prior owners of the Holyoke Project of hauling sediment from in front of Boatlock station and depositing it into the head of the First Level Canal branch. HG&E will use a clamshell to clean the area in front of Boatlock Station and remove the sediment and debris from the canal.

With the installation of the full depth louvers and a trashrake before the Spring 2003 drawdown, the need for heavy machinery in the canal and time it takes to remove debris at Boatlock has been significantly diminished. If heavy machinery should be necessary in the fixture, HG&E will walk the area and clear the area of any visible mussels then install cones to mark boundaries available to vehicular traffic in front of Boat Station during maintenance drawdowns.

3.4.3 Second Level Canal

The following discussion reiterates the measures described in the mussels section of the T&E Plan, Section 5.4.2 (Second Level Canal Drawdown).

During the Spring 2002 drawdown, modified procedures were utilized in an effort to provide the maximum amount of wetted canal floor in the Second Level Canal downstream of Boatlock Station. Stakeholders were on-site to observe the effects of these procedures, and all present were generally satisfied with the conditions. Therefore, the drawdown procedures are being replicated for future outages. HG&E will attempt to coordinate drawdown efforts with other station owners to maintain maximum wetted area.

Below are the general procedures HG&E will follow under normal (non-emergency) conditions:

- 1) Before the canal drain begins all HG&E and customer units except Boatlock and Riverside Stations must be shut down.
- 2) The canal headgates will be closed, beginning the canal drainage.
- 3) Boatlock Station units will be operated until the water level in the First Level Canal reaches approximately El. 92.5 (NGVD). After the water elevation reaches approximately El. 92.5 (NGVD), Boatlock feed gates will be opened to continue draining the First Level Canal.
- 4) One or more waste gates at the No. 1 Overflow will be opened to assist the draining process. These waste gates will have to be carefully regulated as to not overflow the fishway attraction system and/or allow the attraction water system and 4-ft diameter drain pipe to the Hadley tailrace to fill with debris.
- 5) The No. 2 Overflow will remain closed during the drawdown until the end, as maintenance activities require. Should HG&E find that the No. 2 Overflow does not maintain sufficient water levels, HG&E will consult with stakeholders about the feasibility of installing a weir in front of the No. 2 Overflow.
- 6) When the Second Level Canal reaches approximately El. 74.5 (NGVD), all but one of the Riverside station generating units will be secured. A unit on the Second Level will be operated at speed/no load to drain the Second Level Canal. This eliminates the previously employed step of securing all units at Riverside Station, opening penstock drain valves on Units 4 and 5. The waste gates at the No. 2 Overflow will be opened during the last 24 hours of the outage for inspection of both the civil works and safety on each unit. Drainage will occur slowly to allow for maximum wetting of the canal floor. Slow drainage typically takes 6-8 hours; emergency drainage lasts 2 hours.
- 7) The No. 3 Overflow will remain closed during the drawdown until the end, as maintenance activities require, maintaining pooled areas between Boatlock and Riverside.
- 8) The No. 4 Overflow gates will be opened to drain the Third Level Canal.

HG&E shall also develop a plan for evaluation of the experimental weir in the First Level Canal to determine if it retains water and to develop and implement plans to modify as required; and a plan for evaluation of the need for additional weirs to keep mussel habitat areas watered.

HG&E may need to occasionally deviate from the above drawdown procedure to perform essential maintenance work. This may include drawing the Second Level Canal down deeper to gain access to certain structures and equipment. These types of drawdowns are infrequent and HG&E will make all reasonable efforts to minimize the duration of the drawdowns.

Typically during drawdowns there is some leakage past the headgates, which serves to provide a minimal amount of flow through a portion of the canal system. To the extent it does not interfere with maintenance activities, HG&E will not completely seal off leakage past the headgates.

3.5 Full Depth Louver Operations

Pursuant to LA 408(b) in the April 2005 Order, HG&E shall continue to operate, clean and otherwise maintain the full depth louvers in the First-Level Canal and the exclusion racks at the attraction water intake gates to ensure efficient and reliable operation of these facilities for the protection of aquatic resources. HG&E shall annually inspect the full depth louvers and exclusion racks, and repair them as necessary. In the event the full depth louver facility is out of service during the Upstream Passage Season [defined in LA 406(a)(2)], the Canal System will not be operated and the headgates will be closed to seal flows into the Canal. If necessary, at the end of the Upstream Passage Season a slow drain of the Canal will be performed to return any fish to the River. In the unlikely event of a failure of the canal louver bypass system, HG&E shall shut the Canal down. If there is a structural failure of the louver panels, HG&E shall implement a slow drawdown process to allow any fish in the Canal downstream of the louver facility to return to the River. As described below, the process consists of: (i) notification, and (ii) slow draining of the canal system:

- (i) Notification: HG&E shall notify MADFW, USFWS and NOAA Fisheries within 24 hours of the louver bypass system outage.
- (ii) Slow Drain: The No. 1 Overflow attraction water gate will be cracked to drain the First Level Canal; the No.2 Overflow gates will be cracked to drain the 'upper' section of the Second Level Canal, and the Riverside Station sluice gate will be cracked to drain the 'lower' portion of the Second Level Canal. HG&E shall monitor the Canal System during the

slow drain process and regulate the drain gates as required to allow fish to exit the Canal System.

In conjunction with the slow drain process, HG&E shall make all reasonable efforts to expedite repairs to the louver bypass facility and return the facility to service.

51 FERC ¶62,314, Holyoke Economic Development and Industrial Corporation, , Project No. 10806-000 - Massachusetts, (Jun. 29, 1990)

<http://prod.resource.cch.com/resource/scion/document/default/%28%40%40FERC-FEG-02+51FERCP62314PAGE63510%29200996112813625DOC17051>

Holyoke Economic Development and Industrial Corporation, , Project No. 10806-000 - Massachusetts [63,510]

[¶62,314]

Holyoke Economic Development and Industrial Corporation, , Project No. 10806-000 - Massachusetts Order Issuing License (Minor Project)

(Issued June 29, 1990)

Fred E. Springer, Director, Office of Hydropower Licensing.

Holyoke Economic Development and Industrial Corporation filed a license application under Part I of the Federal Power Act (Act) to construct, operate and maintain the Station No. 5 Project located on the second level canal on the west bank of the Connecticut River, in Hampden County, Massachusetts. The Connecticut River is a navigable waterway of the United States. ¹

Notice of the application has been published. No protests were filed in this proceeding, and no agency objected to issuance of this license. Comments received from interested agencies and individuals have been fully considered in determining whether to issue this license. A motion to intervene was filed by the Holyoke Water Power Company (HWP) in order to be a party in this proceeding. HWP also requests that any license issued which utilizes HWP's Holyoke Canal System water be conditioned to require cooperation with HWP as the licensee for the Hadley Falls Project No. 2004. Article 202 is included to provide for appropriate cooperation.

Comprehensive Planning

Sections 4(e) and 10(a)(1) of the Act require the Commission to consider and balance in the public interest, all uses of the waterway on which a project is proposed. Neither we nor the resource agencies have identified any conflicts between development and operation of the Station No. 5 Hydroelectric Project, as proposed by EDIC and (a) the environmental values of the project area or (b) other beneficial public uses of the waterway.

The proposed project would generate about 2,009 megawatthours (MWh) of electric energy per year. This power would displace fossil-fueled electric power plant generation, improve air quality, and conserve fossil fuels.

We have evaluated the effects of the proposed project on the resources of the project area and have found that the proposed project would have only minor, short-term adverse impacts as a result of resuspension of sediments during construction activities and project start-up.

No alternative was identified that would better use the project resources in terms of providing power and environmental benefits without significant environmental cost. We considered one alternative to licensing the Station No. 5 Hydroelectric Project -- no action. We concluded that denying the project application is not the recommended alternative for two reasons. (1) The environmental effects of rehabilitating and operating the project would be minor and short-term. (2) The electricity generated from a renewable resource would be used by Holyoke Electric, thus reducing the use of existing fossil-fueled generating plants and thereby conserving nonrenewable primary energy resources and reducing atmospheric pollution.

Section 10(a)(2) of the Act requires the Commission to also consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. Under section 10(a)(2), federal and state agencies filed eight

comprehensive plans that address various resources in Massachusetts. Of these, we identified and reviewed four plans relevant to this project.² No conflicts were found.

[63,511]

Based upon a review of the agency and public comments filed in this proceeding, and on our independent analysis pursuant to Sections 4(e), 10(a)(1), and 10(a)(2) of the Act, we conclude that the Station No. 5 Hydroelectric Project is best adapted to a comprehensive plan for the Connecticut River.

Summary of Findings

An EA was issued for this project. Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the EA attached to this order. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if constructed, operated and maintained in accordance with the requirements of this license. Analysis of related issues is provided in the Safety and Design Assessment attached to this order.

The Director, Office of Hydropower Licensing, concludes that the project would not conflict with any planned or authorized development, and would be best adapted to comprehensive development of the waterway for beneficial public uses.

The Director orders:

(A) This license is issued to Holyoke Economic Development and Industrial Corporation (licensee), for a period of 40 years, effective the first day of the month in which this order is issued, to construct, operate and maintain the Station No. 5 Project. This license is subject to the terms and conditions of the Act, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, enclosed by the project boundary shown by exhibit G:

Exhibit G-	FERC No.	Showing
Sheet 1	10806-4	Project Boundary
Sheet 2	10806-5	Project Boundary

(2) Project works consisting of: (a) a gated intake with trashracks located on the Second Level Canal of the Holyoke Water Power Company; (b) two 75-foot-long, 6.5-foot-diameter, steel penstocks; (c) a refurbished single-runner, vertical Kaplan turbine connected to a 790-kW generator; (d) a 375-foot-long, 16.5-foot-wide by 11-foot-high arched brick-lined tailrace tunnel; (e) a steel gate where the tailwater empties into the Connecticut River; (f) a 4.8-kilovolt, 370-foot-long interconnection with the Holyoke Gas and Electric Department's underground service line, and (g) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of exhibits A and F recommended for approval in the attached Safety and Design Assessment.

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

(C) The exhibit G described above and those sections of exhibits A and F recommended for approval in the attached Safety and Design Assessment are approved and made part of the license.

(D) The following sections of the Act are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates to public notice and to the acceptance and expression in the license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15; 16; 19; 20; and 22.

(E) This license is subject to the articles set forth in Form L-14, (October 1975) [reported at 54 FPC 1876], entitled "Terms and Conditions of License for Unconstructed Minor Project Affecting Navigable Waters of the United States", except article 15, and the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective the first day of the month in which this license is issued:

For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 1,050 horsepower.

Article 202. The licensee shall cooperate with the licensee for Project No. 2004 in order that the conditions of Article 16 of the license for Project No. 2004 can be fulfilled.

Article 203. The licensee shall clear and keep clear to an adequate width all lands along open conduits and shall dispose of all temporary

[63,512]

structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which result from maintenance, operation, or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of lands and disposal of unnecessary material shall be done with due diligence to the satisfaction of the authorized representative of the Commission and in accordance with appropriate federal, state, and local statutes and regulations.

Article 301. The licensee shall commence construction of the project works within 2 years from the issuance date of the license and shall complete construction of the project within 4 years from the issuance date of the license.

Article 302. The licensee, at least 60 days before start of construction, shall submit one copy, to the Commission's Regional Director and two copies to the Director, Division of Dam Safety and Inspections, of the final contract drawings and specifications for pertinent features of the project, such as the power facilities, water conveyance structures, and all necessary transmission facilities. The Director, Division of Dam Safety and Inspections, may require changes in the plans and specifications to ensure a safe and adequate project.

Article 303. The licensee, within 90 days of completion of construction, shall file for Commission approval, revised exhibits A, F, and G, to describe and show the project as built, including all facilities determined by the Commission to be necessary and convenient for transmission of all of the project power to the interconnected system.

Article 304. The licensee shall review and approve the design of contractor-designed cofferdams and deep excavations before the start of construction and shall ensure that construction of the cofferdams and deep excavations is consistent with the approved design. At least 30 days before start of construction of any cofferdam, the licensee shall submit to the Commission's Regional Director, and the Director, Division of Dam Safety and Inspections, one copy each of the approved cofferdam construction drawings and specifications and letter(s) of approval.

Article 401. The licensee, after consulting with the Massachusetts Division of Fisheries and Wildlife (DFW) and the U.S. Fish and Wildlife Service (FWS), but at least 90 days prior to the start of project construction, shall file for Commission approval a schedule for undertaking any in-water rehabilitation construction work and silt cleaning operations that ensures that in-water rehabilitation construction work and silt cleaning operations do not occur during spawning runs of anadromous fish species. The Commission reserves the right to require changes to the schedule.

Article 402. The licensee, after consulting with the Massachusetts Division of Fisheries and Wildlife (DFW) and the U.S. Fish and Wildlife Service (FWS), shall develop a plan for installing, operating, and maintaining

a trashrack structure to reduce entrainment of anadromous fish. The licensee, at least 90 days prior to the start of project construction, shall file for Commission approval functional design drawings of the project trashrack structure and a plan and schedule for installing the trashrack. This filing shall include, but not be limited to: (1) specifications of the size of the openings between the trashrack bars, which are not to exceed 1 inch, and the maximum intake approach velocity; (2) a description of the methods and schedule for installing the trashrack; and (3) documentation of consultation with DFW and FWS and written comments and recommendations from these agencies on the plan and schedule. The Commission reserves the right to require changes to the functional design drawings and the construction schedule. The licensee shall file as-built drawings of the trashrack pursuant to article 303.

Article 403. Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or provide for the construction, operation, and maintenance of such fishways as may be prescribed by the Secretary of the Interior pursuant to section 18 of the Federal Power Act.

Article 404. The licensee, before starting any activities within the project boundaries, other than those specifically authorized in this license, with the potential for affecting properties listed on or eligible for listing on the *National Register of Historic Places* -- in particular the Holyoke canal system and the Valley Paper Company's existing mill works--shall consult with the Massachusetts State Historic Preservation Officer (SHPO).

If the licensee discovers previously unidentified archeological or historic properties during the course of constructing or developing project works or other facilities at the project, the licensee shall stop all land-clearing and land-disturbing activities in the vicinity of the properties and consult with the SHPO.

In either instance, the licensee shall file for Commission approval a cultural resource management plan prepared by a qualified cultural resource specialist after having consulted with the SHPO. The management plan shall include the following items: (1) a description of each discovered property indicating whether it is listed on or eligible to be listed on the *National Register*

[63,513]

of Historic Places; (2) a description of the potential effect on each discovered property; (3) proposed measures for avoiding or mitigating effects; (4) documentation of the nature and extent of consultation; and (5) a schedule for mitigating effects and conducting additional studies. The Commission may require changes to the plan.

The licensee shall not begin land-clearing or land-disturbing activities, other than those specifically authorized in this license, or resume such activities in the vicinity of a property, discovered during construction, until informed that the requirements of this article have been fulfilled.

Article 405. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The types of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) noncommercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible

and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) nonproject overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and

[63,514]

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

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

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

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources

of an exhibit E; or, if the project does not have an approved Exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

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

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

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

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(G) This order is issued under authority delegated to the Director and is final unless appealed to the Commission by any party within 30 days from the issuance date of this order. Filing an appeal does not stay the effective date of this order or any date specified in this order. The licensee's failure to appeal this order shall constitute acceptance of the license.

Environmental Assessment
Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Project Review
June 25, 1990
Station No. 5 Hydroelectric Project
FERC Project No. 10806-000

[63,515]

A. Application

1. Application type: Minor license, existing dam
2. Date filed with the Commission: June 15, 1989
3. Applicant: City of Holyoke, Economic Development and Industrial Corporation (EDIC)
4. Water body: Holyoke canal River basin: Connecticut
5. Nearest city or town: Holyoke (See figure 1.) ¹
6. County: Hampden State: Massachusetts

B. Purpose and Need for Action

1. Purpose.

The Station No. 5 Hydropower Project would generate an estimated 2,009 megawatthours (MWh) of electric energy per year, which would be sold to and used by the City of Holyoke Gas and Electric Department (Holyoke Electric) in its system.

2. Need for power.

A need for the power produced from a proposed project can be defended only when an alternative source capacity and energy equal to that of the proposed project would be needed to meet forecasted future load growth and to maintain adequate reserve margins required for reliability of power supply, in the event the proposed project cannot be developed. In such cases, the need can be that of a reliability council area, an area "islanded" by transmission constraints, an individual electric utility, or an industry with special requirements.

The proposed project, if developed, would have a capacity of only 790 kilowatts (kW). This capacity and the associated energy would be purchased by Holyoke Electric. Holyoke Electric is currently purchasing large amounts of power from sources with high-capacity facilities, such as NEPEX, Northeast Utilities, Central Maine Power, and others; and, as a result could easily purchase additional power equivalent to the output of the proposed project. We cannot, therefore, claim there is a need for the power output of the proposed project to enable any utility to meet its system load or reserve requirements.

We can claim there is always a need for power from new renewable resources, such as the proposed project, to displace fossil-fueled power generation and its related atmospheric pollution, and to provide long-term economic benefits to Holyoke Electric's customers.

C. Proposed Project and Alternatives

1. Description of the proposed action. (See figure 2.)

The existing facilities were installed in the Valley Paper Company Building in 1931 and remained in good working order until 1972. However, the project has not been operated since that time, and now requires some rehabilitating, particularly at the intake structure.

EDIC proposes to remove the gates, penstock opening frames, gate guides and support framework, trashrack support structure, trashrack platform, and the top beams and panels of the ice fender; install new concrete headwalls with guides for new slide gates, to be made of aluminum or steel, with manual operators and mounting frames; install a new steel trashrack in a new mounting structure made of wood or steel; sandblast and waterproof the penstocks; and remove rock debris that has accumulated in the existing tailrace tunnel. The cost of rehabilitating the project is estimated to be \$807,000.

The proposed project would consist of the following new and existing facilities: (1) a new gated intake with new trashracks located on the second level of the Holyoke canal; (2) two existing 75-foot-long, 6.5-foot-diameter, steel penstocks; (3) a refurbished 1931 single-runner, vertical Kaplan turbine directly coupled to a rewound 790-kW generator; (4) an existing 375-foot-long, 16.5-foot-wide by 11-foot-high arched brick-lined tailrace tunnel that terminates at a large concrete outfall structure; (5) an existing steel slide gate operated by threaded stem operators that provide closure of the tailrace tunnel at the Connecticut River; (6) an existing 4.8-kilovolt, 370-foot-long underground cable interconnecting with Holyoke Electric's distribution system; and (7) other necessary facilities. The Holyoke Water Power Company (HWPC) controls flows from the Connecticut River into the canal system under a FERC major license granted to the Hadley Falls Project, Project No. 2004.

2. Applicant's proposed mitigative measures.

EDIC proposes to use a steel, sheet-pile cofferdam to dewater the intake construction site, and to schedule work on the intake structure and silt removal during low-flow periods, if possible, during the annual dewatering of the Holyoke canal. The proposed project's intake opening plans include restoring trashracks with 1-inch slot width spacing between bars.

3. Federal lands affected.

No.

4. Alternatives to the proposed project.

[63,516]

- a. No reasonable action alternatives have been found.
- b. Alternative of no action.

The alternative to the proposed action is denial of a license to redevelop and operate the proposed project. Although that would have little effect on the adequacy of electric power supply for the City of Holyoke or for the surrounding area, it would have effects that are not in the public interest. Approximately 2,000 MWh's of the Connecticut River's renewable and nonpolluting energy would be needlessly foregone every year. Moreover, the equivalent energy would have to come, largely or totally, from fossil-fueled plants -- amounting to a failure to reduce both the consumption of non-renewable energy resources and atmospheric pollution.

D. Consultation and Compliance

1. Fish and wildlife agency consultation (Fish & Wildlife Coordination Act).

- a. U.S. Fish & Wildlife Service: Yes.
- b. State(s): Yes.
- c. National Marine Fisheries Service: Yes.

2. Section 7 consultation (Endangered Species Act).

- a. Listed species: Present.
- b. Consultation: Not required.

Remarks: The federally listed endangered shortnose sturgeon under the jurisdiction of the National Marine Fisheries Service (NMFS) inhabits the lower segment of the Connecticut River from the river's mouth upstream to the Holyoke dam. A small landlocked population is found in the pool above the Holyoke dam (Taubert, 1980). Dadswell *et al.* (1984) estimated that between 800 and 1,000 shortnose sturgeon inhabit the lower portion of the Connecticut River, below Holyoke. By letter dated April 13, 1989, the NMFS states that the project is not likely to adversely affect the shortnose sturgeon. Further, the NMFS reports that due to the proposed 1-inch trashrack spacing, any sturgeon which might enter the canal would be prevented from entrainment into the project (personal communication, Chris Mantzaris, staff, National Marine Fisheries Service, Gloucester, Massachusetts, June 13, 1989).

3. Section 401 certification (Clean Water Act).

Required; applicant requested certification on 05/31/89.

Status: Granted by the certifying agency on 08/16/89.

4. Cultural resource consultation (Historic Preservation Act).

- a. State Historic Preservation Officer: Yes.
- b. National Park Service: Yes.
- c. *National Register* status: Eligible or listed.
- d. Council: Not required.
- e. Further consultation: Not required.

Remarks: The project is adjacent to the Holyoke canal System, a property listed in the *National Register of Historic Places*; and in the Valley Paper Company's existing mill works, an eligible property. The project would not affect the canal system, the mill works, or any other *National Register* or eligible properties. The SHPO concurs with this finding (letter from Valerie A. Talmage, Executive Director, Massachusetts Historical Commission, and State Historic Preservation Officer, Boston, Massachusetts, November 1, 1988).

5. Recreational consultation (Federal Power Act).

- a. U.S. Owners: No.
- b. National Park Service: Yes.
- c. State(s): Yes.

6. Wild and scenic rivers (Wild and Scenic Rivers Act).

Status: None.

7. Land and Water Conservation Fund lands and facilities (Land and Water Conservation Fund Act).

Status: None.

E. *Comments*

1. The following agencies and entities provided comments on the application or filed a motion to intervene in response to the public notice dated 03/20/89.²

Commenting agencies and other entities--Date of letter

Department of the Army, New England Division Corps of Engineers--March 20, 1990

Department of the Interior--March 22, 1990

Motions to intervene--Date filed

Holyoke Water Power Company--03/28/90

2. The applicant did not respond to the comments or motion(s) to intervene.

[63,517]

F. *Affected Environment*

1. General description of the locale. (See figure 3.)

a. Description of the Connecticut River Basin.

The Connecticut River Basin, with a drainage area of 11,765 square miles, is the largest river basin in New England. Extending from the northernmost part of New Hampshire to Long Island Sound, the river basin has a maximum length in a north-south direction of about 280 miles and a maximum width of about 62 miles. The total drainage area of the basin is 11,765 square miles. The principal tributaries to the main stem Connecticut River, by state, are the Passumpsic, White, West, Ottauquechee, and Black Rivers in Vermont; the Ammonoosuc, Mascoma, Ashuelot, and Sugar Rivers in New Hampshire; the Millers, Deerfield, Chicopee, and Westfield Rivers in Massachusetts; and the Farmington River in Connecticut.

This complex of rivers and tributaries constitutes one of the most extensively developed hydropower systems in the U.S. There is now a major effort by federal, state, and private sectors to restore Atlantic salmon to the Connecticut River Basin.

The project is located in a heavily industrialized setting between the second level of the Holyoke canal system and the Connecticut River. The climate is typical of inland Connecticut and Massachusetts with an average temperature of 49.8 degrees Fahrenheit and an average annual precipitation of 44.39 inches.

b. Number of major and minor licensed, and exempted projects in the Connecticut River basin as of June 5, 1990.

Major licensed 37

Minor licensed 46

Exempted 45

c. Number of pending applications for major or minor licenses, and for exemptions in the Connecticut River basin as of June 5, 1990.

Pending major license 2

Pending minor license 3

Pending exemption 2

d. Cumulative impacts.

A target resource is an important resource that may be cumulatively affected by multiple development within a basin.³

We have identified Atlantic salmon and American shad as target resources in the Connecticut River Basin (Federal Energy Regulatory Commission, 1986). These and other anadromous fish species are known to migrate upstream and downstream in both of two yearly periods -- from April through July, and again during September and October.⁴

Atlantic salmon and American shad were selected because of the regional significance and geographic distribution of this species within the river basin. This anadromous fishery resource is described below in section F(2d). We discuss impacts to Atlantic salmon and American shad in section G.

2. Descriptions of the resources in the project impact area⁵

a. *Geology and soils*: Bedrock in the project area is interbedded sandstone, shale, conglomerate, and basaltic lava. The glacial till deposits that lie on the glaciated surface of the bedrock are overlain by varied glacial lake deposits. The original dry, sandy, surface soils in the project area have been highly altered by construction of the project and by fill and construction activities associated with urban development of the area.

b. *Streamflow*: Waterflow in the canal system is controlled at the canal gatehouse to supply necessary water to various hydropower and industrial facilities along the canal. The amount of flow entering the canal system ranges from no flow, when the gatehouse is shut down, to 5,155 cubic feet per second, which is the maximum hydraulic capacity of the canal.

c. *Water quality*: The Connecticut River upstream of Holyoke dam is classified as Class B water by the Massachusetts Division of Water Pollution -- i.e., suitable for primary and secondary contact recreation and fish and wildlife resources. Class B water must have dissolved oxygen (DO) levels greater than 5.0 milligrams per liter (mg/l) and a pH between 6.5 and 8.0. The water in the Holyoke canal

[63,518]

system is classified as Class C -- i.e., suitable for secondary contact recreation and fish and wildlife resources, and must have a DO level greater than 5.0 mg/l and a pH between 6.5 and 9.0 standard units. Water in the project area conforms to the state water quality standards.

d. *Fisheries*:

Anadromous: Present.

Anadromous fish species found in the Connecticut River in the vicinity of the project include American shad, Atlantic salmon, blueback herring, sea lamprey, striped bass, shortnose sturgeon, and American eel (catadromous).

Resident: Present.

Resident fish species found in the Connecticut River in the vicinity of the project include carp, channel catfish, smallmouth bass, largemouth bass, spottail shiner, white perch, bluegill, rainbow trout, and brown trout.

e. *Vegetation*: The project would be located in an urban area. Vegetation in the immediate area of the project consists of weedy grasses and forbs. Near the river is a strip of trees consisting of immature red and sugar maple, box elder, birch, ash, and hickory. Also present are shrubs -- viburnum and poison ivy.

f. *Wildlife*: Available habitat restricts species present to urban tolerant species such as squirrels, mice, raccoons, rats, cardinals, and sparrows.

g. *Cultural*: There are properties listed on, or eligible for listing on, the *National Register of Historic Places* in the project impact area. They are the Holyoke canal system and the Valley Paper Company's existing mill works.

Description: The canal system, a contributing element in the Holyoke Canal Historic District, is listed on the *National Register of Historic Places* and is within the area of the project's potential environmental impact. The portion of the canal in the project area was constructed between 1854 and 1857. The existing mill works are eligible for listing on the *National Register*.

h. *Visual quality*: The project is in an industrial area. Its appearance is consistent with that of the surrounding buildings and structures.

- i. *Recreation*: The immediate project area receives no significant recreational use because of its location in a highly industrialized area. No recreational facilities are located at the project. Recreational facilities are currently available at Riverside Park 2.4 miles downstream, at Jones Park 1.7 miles upstream, and at the Hadley Falls Hydroelectric Project 0.4 miles upstream.
- j. *Land use*: The proposed project is located in an industrial setting consisting of mill buildings, a 3-level canal system providing water for power generation, and access roads and bridges.
- k. *Socioeconomics*: The socioeconomic well-being of the area is influenced by industrial and urban development.

G. *Environmental Issues and Proposed Resolutions*

There are 6 issues addressed below.

1. *Construction-related sedimentation*: Although EDIC reports that no bottom sediments would be excavated or dredged from the tailrace, some minor disturbance of sediments would occur when rock debris is removed from the tailrace. Out of a concern for the effects of resuspended sediments on water quality and migrating anadromous fish, MDFW recommends that EDIC schedule its in-water construction around upstream and downstream anadromous fish migrations (letter from Mark Tisa, Coordinator, Anadromous Fish Program, Commonwealth of Massachusetts, Division of Fisheries and Wildlife, Field Headquarters, Westborough, Massachusetts, October 12, 1988).

EDIC proposes to use a cofferdam for its in-water construction, and to schedule in-water construction to coincide with periods when flows are low, and anadromous fish are not migrating upstream or downstream -- i.e., any time of the year other than mid-April to mid-July and during the months of September and October. The licensee after consulting with the MDFW and the U.S. Fish and Wildlife Service (FWS), should file for Commission approval a schedule for undertaking any in-water rehabilitation construction work and silt cleaning operations that ensures that such work does not conflict with spawning runs of anadromous fish species.

2. *Cumulative impacts on Atlantic salmon and American shad resulting from developing several hydropower projects in the Connecticut River Basin*: Atlantic salmon and American shad are currently a primary target species for a major federal, state, and private sector restoration effort. The goal of the restoration program is to provide and to maintain a sport fishery for Atlantic salmon and American shad in the Connecticut River, and to restore and maintain spawning populations in selected tributaries (Federal Energy Regulatory Commission, 1986).

The basin's seaward-migrating salmon smolts, adult shad, and juvenile shad pass numerous hydropower developments where

[63,519]

they may become entrained and impinged, during the months indicated below. ⁶

Migrating species and life stage--Months when downstream migration occurs

adult Atlantic salmon (post-spawning)--November to mid-April ⁷

Atlantic salmon smolt--April and May

adult American shad--June and July

juvenile American shad--September and October

The more hydropower facilities outmigrating fish have to pass, the greater the risk of fish losses. Among these hydropower facilities are the Holyoke dam and the canal system.

When river discharges are high and water is flowing over the dam, migrating fish pass downstream with little or no delay (Northeast Utilities Service Company, 1984). On the other hand, outmigrating fish would be entrained into the canal system by high flows entering the canal if they arrive at the dam when flashboards, permitting little or no spillage, are in place. Once in the canal, escape is very difficult. Fish can then be entrained in the turbines of hydropower plants operating along the canal.

On February 26, 1988, the Commission ordered the HWPC to spill water over Holyoke dam when salmon smolts are migrating downstream (Federal Energy Regulatory Commission, 1988a). [HWPC is the licensee

for the Hadley Falls Project (FERC Project No. 2004) and the entity that controls the dam and the water going into the canal.] Spilling water over the Holyoke dam allows migrating salmon smolts to pass safely downstream in the spill, instead of entering the canal system.

Canal users and the HWPC have since implemented an economic dispatch agreement, in which the HWPC passes all flow downstream at the Holyoke dam, shuts down the canal, and sells the users electricity, instead of water, when salmon smolts are migrating downstream. EDIC expects to participate in this agreement, if feasible; and if not, EDIC expects to pursue a new agreement with HWPC to embody an identical arrangement. Since the proposed project would not operate during the period the canal is shut down, the project would not affect the outmigrating salmon smolt during the period the canal is shutdown.

3. Project-related fish mortality and the use of trashracks: Operation of the proposed project could cause impingement and entrainment-related mortalities to anadromous fish -- American shad, blue back herring, and possibly the endangered short-nose sturgeon. As fish pass through the turbines, mortality or injury would occur as a result of being struck by turbine blades, pressure changes, shear forces in turbulent flows, and water velocity accelerations (Knapp *et al.*, 1982). The design of the project intake structure would reduce project-induced fish injury or mortality. Trashracks have been used at hydropower plants to discourage fish from entering project intakes. The size of bar spacing of the trashracks can influence entrainment rates (Bell, 1984).

The MDFW (letter from Mark Tisa, Coordinator, Anadromous Fish Program, Commonwealth of Massachusetts, Division of Fisheries and Wildlife, Field Headquarters, Westborough, Massachusetts, October 12, 1988) recommended that for the protection of anadromous fish -- Atlantic salmon and American shad -- trashrack bar spacing should not exceed 1 inch.

To protect anadromous fish, EDIC has proposed to replace the existing trashrack at the facility with a new trashrack with 1-inch bar spacing. We conclude that the trashrack design, as proposed, would protect anadromous fish resources in the project area and would minimize entrainment-related mortality and injury to anadromous fish. Therefore, a trashrack with a maximum bar spacing of 1-inch should be installed at the project intake. The licensee, after consultation with the MDFW and the FWS, should file for Commission approval functional design drawings for the proposed trashrack, including a schedule for construction.

4. Reservation of authority to prescribe fishways: The Department of the Interior (Interior) requests that its authority to prescribe the construction, operation and maintenance of fishways, pursuant to section 18 of the Act, be reserved for any project licensed at Station No. 5 Hydroelectric Project.

Section 18 of the Act provides the Secretary of the Interior the authority to prescribe

[63,520]

fishways.⁸ Although fish passage facilities may not be recommended by Interior at the time of project licensing as is the case for the Station No. 5 Hydroelectric Project, the Commission should include license articles which reserve Interior's prescription authority.⁹ We recognize that future fish passage needs and management objectives cannot always be predicted when the license is issued. Therefore, any license issued for the project should be conditioned to reserve Interior's authority to prescribe fishways.

5. Screening the tailrace: Interior states that, should the tailrace discharge pose an attraction problem for anadromous fish in the future, section 18 of the Federal Power Act (Act) will allow the Secretary of the Interior to prescribe tailrace screening should it be necessary.

Although few salmon have been reported in the project area the potential for project-related impacts to this resource could increase as Atlantic salmon returns improve. The success of Atlantic salmon returns reported downstream of the proposed project demonstrate the potential for improved salmon returns at the proposed project area in the near future.

We conclude that screens should only be considered an appropriate fishway component if they were prescribed by Interior in the future to reduce the attraction of migrating fish to the tailrace and to direct these fish to upstream passage facilities. In this instance, the purpose of tailrace screens at the Station No. 5 Hydroelectric Project would be to enhance Atlantic salmon movement upstream in the Connecticut River to the existing Holyoke fish lift facilities located at the Holyoke dam, upstream of the project.

First, there could be significant undiscovered properties in the project area that could be adversely affected by the proposed rehabilitation. If such properties are found during project development or during project operation, the licensee should take the following actions: (a) consult with the SHPO; (b) based on consultations with the SHPO, prepare a plan describing the appropriate course of action and a schedule for carrying it out; (c) file the plan for Commission approval; and (d) take the necessary steps to protect the discovered properties from further impact until notified by the Commission that all of these requirements have been satisfied.

H. Environmental Impacts

0 = None; 1 = Minor;
2 = Moderate; 3 = Major;
A =
Adverse; B = Beneficial;
L = Long-term; S = Short term.

Resource	Impact		
	P	Ps	A
a. Geology-Soils	0		
b. Streamflow	0		
c. Water quality:			
Temperature	0		
Dissolved oxygen	0		

[63,521]

Turbidity and sedimentation 1AS

d. Fisheries:

Anadromous 1AL

Resident 1AL

e. Vegetation 0

f. Wildlife 0

g. Cultural:

Archeological 0

Historical 0

h. Visual quality 0

i. Recreation 0

j. Land use 0

k. Socioeconomics 0

Explanation of item c. Project construction would cause some minor short-term sedimentation and turbidity. There would be some minor short-term resuspension of silt after project start-up.

Explanation of item d. There would be some minor entrainment of fish in the project area.

2. Impacts of the no-action alternative.

Under the no-action alternative, there would be no rehabilitation of project facilities or changes to the existing physical components of the area. Electrical power that would be generated by the proposed hydroelectric project would have to be generated from other available sources or offset by conservation measures.

1. Recommended Alternative

Proposed project (including proposed, required, and recommended mitigative measures).

1. Comprehensive Development -- Reason(s) for selecting the recommended alternative.

We recommend the proposed project (including proposed, required, and recommended mitigative measures) because it would develop the hydroelectric potential of the site and would produce electrical energy without significantly affecting the existing environmental conditions.

Sections 4(e) and 10(a)(1) of the Federal Power Act (Act) require the Commission to consider and balance in the public interest, all uses of the waterway on which a project is proposed. Neither we nor the resource agencies have identified any conflicts between development and operation of the Station No. 5 Hydroelectric Project, as proposed by EDIC and (a) the environmental values of the project area or (b) other beneficial public uses of the waterway.

The proposed project would generate about 2,009 MWh of electric energy per year. This power would displace fossil-fueled electric power plant generation, improve air quality, and conserve fossil fuels.

We have evaluated the effects of the proposed project on the resources of the project area and have found that the proposed project would have only minor, short-term adverse impacts as a result of resuspension of sediments during construction activities and project start-up.

No alternative was identified that would better use the project resources in terms of providing power and environmental benefits without significant environmental cost. We considered one alternative to licensing the Station No. 5 Hydroelectric Project -- no action. We concluded that denying the project application is not the recommended alternative for two reasons. (1) The environmental effects of rehabilitating and operating the project would be minor and short-term. (2) The electricity generated from a renewable resource would be used by Holyoke Electric, thus reducing the use of existing fossil-fueled generating plants and thereby conserving nonrenewable primary energy resources and reducing atmospheric pollution.

Section 10(a)(2) of the Act requires the Commission to also consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. Under section 10(a)(2), federal and state agencies filed eight comprehensive plans that address various resources in Massachusetts. Of these, we identified and reviewed four plans relevant to this project.¹⁰ No conflicts were found.

Based upon a review of the agency and public comments filed in this proceeding, and on our independent analysis pursuant to sections 4(e), 10(a)(1), and 10(a)(2) of the Act, we conclude that the Station No. 5 Hydroelectric Project is best adapted to a comprehensive plan for the Connecticut River.

2. Unavoidable Adverse Impacts of the Recommended Alternative

A minor amount of short-term resuspension of silt would be unavoidable during removal of

[63,522]

rock debris from the tailrace and during project start-up.

J. Conclusion

Finding of No Significant Impact. Approval of the recommended alternative [H(2)] would not constitute a major federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement (EIS) will not be prepared.

K. Literature Cited

Bell, M.C. 1984. Fisheries handbook of engineering requirements and biological criteria. Department of the Army, North Pacific Division, Portland District and Walla Walla District, Corps of Engineers, January 1984. 290 pp.

Dadswell, M.J., B.D. Taubert, T.S. Squires, D. Marchette, and J.L. Buckley. 1984. Synopsis of biological data on shortnose sturgeon (*Acipenser brevirostrum*) Lesueur 1818. National Oceanic and Atmospheric Administration Technical Report NMFS 14, National Oceanic and Atmospheric Administration, Washington, D.C., 45 pp.

Economic Development and Industrial Corporation. 1989. Application for a new license for a minor water project, Station No. 5 Hydroelectric Project, FERC Project No. 10806. Holyoke, Massachusetts. June 1989.

Federal Energy Regulatory Commission. 1983. Planning status report for the Connecticut River Basin. Washington, DC. August 1983.

(,48,. 1986. Environmental assessment for the Connecticut River Basin. Washington, DC. November 7, 1986.

(,48,. 1988a. Order amending license for the Hadley Falls Project, FERC Project No. 2004, Massachusetts. February 26, 1988.

(,48,. 1989. Environmental assessment for the Crocker Mill, A and B Wheels, Hydroelectric Project, FERC Project No. 2758, Holyoke, Massachusetts. June 16, 1989.

Knapp, W.E., B. Kynard, and S.P. Gloss (editors). 1982. Potential effects of Kaplan, Osseberger, and bulb turbines on anadromous fishes of the northeast United States. FWS/OBS-82/62. U.S. Fish and Wildlife Service, Newton Corner, Massachusetts. September 1982. 132 pp.

Linweave, Inc. 1988. Application for minor license for the Crocker Mill, A and B Wheels, Hydroelectric Project, FERC Project No. 2758, Massachusetts. November 28, 1988.

Northeast Utilities Service Company. 1984. Review of cancelled Atlantic salmon smolt (*Salmo salar*), radiotelemetry study at the Holyoke dam, Massachusetts. Hartford, Connecticut. September 1984.

Taubert, B.D. 1980. Biology of shortnose sturgeon (*Acipenser brevirostrum*) in the Holyoke pool, Connecticut River, Massachusetts. Ph.D. Thesis. University of Massachusetts, Amherst, 136 pp.

L. List of Preparers

(Name--Position title)

James T. Griffin--Archeologist (Coordinator)

Rainer Feller--Ecologist

Peter Leitzke--Geologist

Patrick Lynch--Environmental Protection Specialist

Mary Golato--Editor

Marc Zimmerman--Ecologist

K. Akhtar--Engineer

Safety and Design Assessment Station No. 5 Hydroelectric Project FERC Project No. 10806-000, MA

June 12, 1990

Project Design

Holyoke Economic Development and Industrial Corporation (Holyoke Corporation) proposes to develop the project on the second level of a three-level canal system, owned and operated by the Holyoke Water Power Company (HWPC), licensee for Hadley Falls Project No. 2004, on the west bank of the Connecticut River. The generating equipment would be installed in a building belonging to the Valley Paper Company.

The project works would consist of: (1) a gated intake with new trashracks located on the Second Level Canal of the HWPC project; (2) two 75-foot-long, 6.5-foot-diameter steel penstocks; (3) a refurbished single-runner, vertical Kaplan turbine connected to a 790-kilowatt (kW) generator; (4) a 375-foot-long, 16.5-foot-wide by 11-foot-high arched, brick-lined tailrace tunnel; (5) a steel gate where the tailwater empties into the Connecticut River; (6) a 4.8-kilovolt (kV), 370-foot-long underground cable interconnecting with the Holyoke Gas and Electric Department's distribution system; (7) certain underground portions of the Valley Paper Company building that would accommodate the generating and other equipment; and (8) other necessary facilities.

Holyoke Corporation acquired the project property along with deeded water rights to the former hydropower site in order to redevelop the project.

[63,523]

Project Safety

The proposed project would not include a dam or other water-impounding structures. All flows to the project site would be delivered by the Holyoke Second Level Canal, owned and operated by HWPC.

Our New York Regional Office (NYRO), in a Preliminary Inspection Report dated September 21, 1989, cited no deficiencies in the proposed operation and stated that the proposed project would have no downstream hazard potential. Since there are no water-impounding structures, we conclude there are no safety related problems.

We conclude the project would be safe and adequate if built and operated according to the terms and conditions of a license.

Water Resource Planning

The power plant would contain a single generating unit. The gross head at the site ranges from 15 to 34 feet, depending upon the tailwater elevation, resulting in a weighted average head of 28 feet. The turbine design head is 26 feet and its hydraulic capacity is estimated to be 299 cubic feet per second (cfs). The project would be operated remotely in a run-of-river mode, and would generate about 2,009 megawatthours (MWh) of energy annually at a plant factor of about 29 percent.

The proposed project is located on the second level of a three-level canal system owned and operated by the HWPC, on the west bank of the Connecticut River. Flows from the Connecticut River are impounded by Holyoke Dam (licensed to HWPC as part of Hadley Falls Project No. 2004) and diverted through an intake structure into the first-level canal. Flows in the first-level canal are diverted through various industrial plants and gate structures into the second-level canal from which the project would get its flows to operate. HWPC operates its own hydropower projects at the Holyoke dam and elsewhere in the canal system.

Flows to the proposed project would be available by deeded purchase rights for specific amounts from HWPC. Deeded entitlements to water from HWPC's canal system are measured in millpowers (a millpower is the flow calculated from an equation based on gross head). For a gross head of 28 feet at this project, 1 millpower equals 26.7 cfs.

The proposed project is entitled to four 16-hour permanent millpowers and three 8-hour permanent millpowers for Connecticut River flows in the range of 3,100 cfs to 3,600 cfs. For river flows less than 3,100 cfs, the permanent millpower allocation is reduced linearly depending on flow. For flows between 3,600 cfs and 15,000 cfs, an additional entitlement equal to half the permanent millpower allocation is permitted. For flows greater than 15,000 cfs, the project is entitled to surplus millpowers up to a maximum of 10 millpowers.

The proposed project under the millpower entitlement is authorized two types of water allocations: 16-hour per day and 8-hour per day. For river flows up to 3,100 cfs, the 16-hour allocation is 0 to 107 cfs and the 8-hour allocation 0 to 80.2 cfs; for flows of 3,100 to 3,600 cfs, the 16-hour allocation is 107 cfs and the 8-hour allocation is 80.2 cfs; for flows of 3,600 to 15,000 cfs, the 16-hour allocation is 160.4 cfs and the 8-hour allocation is 120.3 cfs; and for flows of 15,000 to 82,880 cfs both the 16-hour and 8-hour allocations are 267.4 cfs.

We estimate the project would, on the average, operate at its entitled surplus allocation flow of 267.4 cfs for 24 hours per day (close to the plant hydraulic capacity of 299 cfs), about 29 percent of the time; at 160.4 cfs for 16 hours per day and 120.3 cfs for 8 hours per day, about 57 percent of the time; and at 107 cfs for 16 hours per day and 80.2 cfs for 8 hours per day, for about 3 percent of the time. The project would be shut down about 11 percent of the time.

The NYRO Prelicense Inspection Report states that the canal system is dewatered 3 times a year for maintenance: there are two, 1-day canal drawdowns in the spring and fall and a 4-day shutdown period in July. During these periods, the canal system is drained, inspected, and repaired, if needed. Repairs are generally scheduled for the July shutdown.

There are certain periods of the year when the project cannot operate and the applicant would be directed by the HWPC to discontinue drawing flows from the canal system.

Our studies show that Holyoke Corporation would make reasonable use of its allocated flows. Because of the water allocation limits of the HWPC, Holyoke Corporation could not develop additional generating capacity at the site. Hence, we conclude the proposed project would adequately develop the head and hydraulic potential of the site.

The August 1983 Planning Status Report for Connecticut River Basin lists 19 existing hydroelectric projects on HWPC's canal system. The report also lists the Holyoke Project on the canal system as a potential project with an installed capacity of 1,222 kW and an annual generation of 13,165 MWh. However, the report states no basis for the capacity or energy generation estimate. The report did not indicate any proposed project on the canal system that would be in conflict with the proposed project.

[63,524]

Sections

Preparers

Khawaja A. Akhtar, Civil Engineer

C. Frank Miller, Electrical Engineer

Mary Golato, Editor

-- Footnotes --

[63,510]

Footnotes

1 See 33 FPC 593, 594 (1965).

2 For a list of the plans, see the attached Environmental Assessment.

[63,515]

1 Due to reproduction requirements, referenced figures have been omitted.

[63,516]

2 The Commonwealth of Massachusetts, Division of Fisheries and Wildlife (MDFW), provided no comments on the application in response to the public notice. There was no need to provide public notice comments since EDIC had adequately addressed all the Commonwealth's concerns by the time the application was filed (personal communication, Mark Tisa, Coordinator, Anadromous Fish Program, Commonwealth of Massachusetts, Division of Fisheries and Wildlife, Field Headquarters, Westborough, Massachusetts June 12, 1990).

[63,517]

3 The Council on Environmental Quality defines cumulative impacts as impacts on the environment that result from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time (40 C.F.R., Part 1508.7).

4 Personal communication, Mark Tisa, Coordinator, Anadromous Fish Program, Commonwealth of Massachusetts, Division of Fisheries and Wildlife, Field Headquarters, Westborough, Massachusetts, June 19, 1990; and Order Amending License to Require downstream fish Passage Facilities, *Holyoke Water Power Company*, [Project No. 2004-012](#), issued February 26, 1988, [42 FERC ¶62,166](#).

5 Source: Federal Energy Regulatory Commission, Environmental Assessment for *Crocker Mill, A and B Wheels*, Hydroelectric Project, [Project No. 2758-003](#), Washington, D.C., June 16, 1989, [47 FERC ¶62,305](#); and City of Holyoke, Economic Development and Industrial Corporation, application, exhibit E, unless otherwise indicated.

[63,519]

6 Source: Order Amending License to Require Downstream Fish Passage Facilities, *Holyoke Water Power Company*, [Project No. 2004-012](#), issued February 26, 1988, [42 FERC ¶62,166](#); and personal communication, Steve Gephard, Connecticut Department of Environmental Protection -- Marine Fisheries, Waterford, Connecticut, June 21, 1990.

7 Information on post-spawning adult Atlantic salmon (kelts) in the Connecticut River is sparse. Therefore, the downstream migration period was estimated, with the assistance of Steve Gephard,

Connecticut Department of Environmental Protection, from information on Atlantic salmon in other northeastern river basins.

[63,520]

- 8 Section 18 of the Act provides: "The Commission shall require construction, maintenance, and operation by a licensee at its own expense of ... such fishways as may be prescribed by the Secretary of Commerce or the Secretary of the Interior as appropriate."
- 9 *Lynchburg Hydro Associates*, [39 FERC ¶61,076](#) (1987).

[63,521]

- 10 Massachusetts outdoors for our common good: open space and outdoor recreation in Massachusetts, 1988, Massachusetts Department of Environmental Management, Division of Planning and Development; Connecticut River Basin water quality management plan, 1983, Massachusetts Department of Environmental Quality Engineering, Division of Water Pollution Control; A strategic plan for the restoration of Atlantic salmon to the Connecticut River Basin, 1982, Policy Committee for Fisheries Management of the Connecticut River; Connecticut River Basin fish passage, flow, and habitat alteration considerations in relation to anadromous fish restoration, 1981, Technical Committee for Fisheries Management of the Connecticut River.



gas | electric | steam | telecom

Commissioners:
Neil J. Moriarty, Jr.
Francis J. Hoey, III
Robert H. Griffin

Manager:
James M. Lavelle

April 6, 2004

Ms. Magalie Roman Salas, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Re: Holyoke Project (FERC No. 2004)
Supplement to Offer of Settlement

Dear Ms. Salas:

On March 12, 2004, the City of Holyoke Gas & Electric Department ("HG&E") filed the Settlement Agreement and supporting Appendices A through H and Figures ("Settlement") on behalf of itself and the U.S. Fish and Wildlife Service; the National Oceanic and Atmospheric Administration, National Marine Fisheries Service; the Commonwealth of Massachusetts Department of Environmental Protection ("MADEP"); the Commonwealth of Massachusetts Department of Fish and Wildlife; Trout Unlimited; the Connecticut River Watershed Council; and the Town of South Hadley (referred to herein as "Settling Parties"). As indicated in the cover letter for that Settlement filing, HG&E had not yet received the signature page to the Settlement Agreement from the MADEP and would file it when received. The MADEP delayed sending its signature page in order to complete the execution of an Administrative Consent Order ("ACO") by HG&E and the MADEP relative to the Settlement and MADEP's Water Quality Certification issued in 2001. That ACO has now been executed by HG&E and MADEP.

Therefore, attached hereto for filing are an original and eight copies of the MADEP signature page and a supplement to Appendix B to the Settlement inserting the ACO. These documents do not modify the Settlement Agreement as previously filed; therefore, HG&E requests that the Commission find that no notice of this supplement is required, or grant a waiver of such a notice if required.

Ms. Magalie Roman Salas, Secretary
Holyoke Project, No. 2004

April 6, 2004
Page 2

HG&E has served a copy of this letter and the enclosed documents on all parties on the official service list in these proceedings, including all Settling Parties. If there are any questions concerning this matter, please contact the undersigned.

Respectfully submitted,



Paul S. Ducheneay
Superintendent of Hydro Operations

Enclosures

cc: R. Fletcher (FERC) (w/ encls.)

D. Desmond (MADEP) (w/ encls.)
R. Kubit (MADEP) (w/ encls.)
C. Slater (MADFW) (w/ encls.)
J. Warner (USFWS) (w/ encls.)
J. Crocker (NOAA Fisheries) (w/ encls.)
C. Lynch (NOAA) (w/ encls.)
J. Williams (NOAA) (w/ encls.)
P. Scida (NOAA Fisheries) (w/ encls.)
D. Pugh (TU) (w/ encls.)
T. Miner (CRWC) (w/ encls.)

N. Skancke (GKRSE) (w/ encls.)
F. Szufnarowski (Kleinschmidt) (w/ encls.)
K. Schaeffer (Kleinschmidt) (w/ encls.)

Agreed and accepted to by U.S. Department of the Interior,
through the U.S. Fish and Wildlife Service

By _____

Dated: _____

Agreed and accepted to by U.S. Department of Commerce,
National Oceanic and Atmospheric Administration,
National Marine Fisheries Service,

By _____

Dated: _____

Agreed and accepted to by Commonwealth of Massachusetts,
Department of Environmental Protection,

By Cynthia Giles, Asst. Commissioner

Dated: 03/10/04

Agreed and accepted to by Commonwealth of Massachusetts,
Department of Fisheries and Wildlife,

By _____

Dated: _____

***Holyoke Project, FERC No. 2004
Supplemented Appendix B to Settlement Agreement
2001 Water Quality Certification
(and related documents)***

2001 Water Quality Certification:

Commonwealth of Massachusetts, Department of Environmental Protection,
Final Water Quality Certification, issued February 14, 2001 (pursuant to settlement of state
administrative appeal of the 1999 Water Quality Certification).

Letters from MADEP:

Letter dated January 10, 2003, from Brian D. Harrington, Acting Deputy Regional Director,
Bureau of Resource Protection, Massachusetts, Department of Environmental Protection, to
Paul S. Duchenev, City of Holyoke Gas & Electric Department.

Letter dated October 6, 2003, from Brian D. Harrington, Acting Deputy Regional Director,
Bureau of Resource Protection, Massachusetts, Department of Environmental Protection, to
Paul S. Duchenev, City of Holyoke Gas & Electric Department.

Letter dated January 21, 2004, from Brian D. Harrington, Acting Deputy Regional Director,
Bureau of Resource Protection, Massachusetts, Department of Environmental Protection, to
Paul S. Duchenev, City of Holyoke Gas & Electric Department.

Letters from HG&E:

Letter dated December 18, 2003, from Paul S. Duchenev, City of Holyoke Gas & Electric
Department, to Brian D. Harrington, Acting Deputy Regional Director, Bureau of Resource
Protection, Massachusetts, Department of Environmental Protection.

Letter dated December 26, 2003, from Paul S. Duchenev, City of Holyoke Gas & Electric
Department, to Brian D. Harrington, Acting Deputy Regional Director, Bureau of Resource
Protection, Massachusetts, Department of Environmental Protection.

Administrative Consent Order:

In the Matter of The City of Holyoke Gas & Electric Department,
File No. ACO-WE-04-6W003.



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WESTERN REGIONAL OFFICE

436 Dwight Street • Springfield, Massachusetts 01103 • (413) 784-1100 • FAX (413) 784-1149

MITT ROMNEY
Governor

KERRY HEALEY
Lieutenant Governor

ELLEN ROY HERZFELDER
Secretary

ROBERT W. GOLLEDGE, Jr.
Commissioner

APR 02 2004

James M. Lavelle, Manager
City of Holyoke Gas & Electric Department
99 Suffolk Street
Holyoke, MA 01040-5082

Re: Holyoke, Holyoke Dam,
FERC Settlement Agreement
& ACO-WE-04-6W003,
Holyoke Gas & Electric
Department

Dear Mr. Lavelle:

Please find enclosed the Department's Final Administrative Consent Order, ACO-WE-04-6W003, ("the Order") as issued relative to the above referenced project, and the § 401 Water Quality Certification issued by this office on February 14, 2001. Please review carefully the terms of the Order, specifically Section III Disposition, and Order, and comply with the requirements stated therein.

If you have any questions, please do not hesitate to contact Robert Kubit at 508-767-2854, or Robert J. McCollum at 413-755-2138.

Enclosures

Sincerely,

A handwritten signature in black ink, appearing to read "BH" followed by a stylized flourish.

Brian Harrington
Deputy Regional Director
Bureau of Resource Protection

CERTIFIED MAIL # 7003 0500 0005 5444 2333, return receipt requested

CC:

**Paul Ducheney, HG&E
Nancy Skancke, GKRSE
Paul Hogan, DEP, DWM
Robert Kubit, DEP, DWM
Deirdre Desmond, DEP, OGC
Caleb Slater, MDF&G
John Warner, USF&WS
Donald Pugh, TU
Tom Miner, CRWC
Patricia Vinchesi, South Hadley**

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the Matter of:)

The City of Holyoke Gas &)
Electric Department)

ADMINISTRATIVE CONSENT ORDER
File No. ACO-WE-04-6W003

I. The Parties

1. The Department of Environmental Protection (Department or DEP) is a duly constituted agency of the Commonwealth of Massachusetts. The Department maintains its headquarters office at One Winter Street, Boston, Massachusetts 02108, and maintains a regional office at 436 Dwight Street, Springfield, Massachusetts, 01103.
2. The City of Holyoke Gas & Electric Department (HG&E) is a duly formed municipal light plant under Chapter 164 of the General Laws of Massachusetts with its offices located at 99 Suffolk Street, Holyoke, MA 01040.
3. The Department and HG&E have agreed to enter into this Administrative Consent Order because they agree that it is in their interests, and in the public interest, to proceed promptly with the actions called for herein rather than expend additional time and resources litigating the allegations set forth below. HG&E enters into this Administrative Consent Order without admitting liability or agreeing with the allegations set forth herein. However, HG&E agrees not to contest the allegations set forth herein for the purposes of the issuance and enforcement of this Administrative Consent Order.

II. Statement of Law and Facts

4. The Department is responsible for implementing and enforcing the provisions of the Massachusetts Clean Waters Act, G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 4.00 (the Massachusetts Surface Water Quality Standards) and 314 CMR 9.00 (the 401 Water Quality Certification Regulations). The Department is authorized to assess civil administrative penalties by G.L. c. 21A, § 16 and the regulations promulgated thereunder at 310 CMR 5.00.
5. The Massachusetts Clean Waters Act, G.L. c. 21, § 27, places the duty and responsibility on the Department to enhance the quality and value of water resources and further requires the Department to:
 - (1)"Take all action necessary or appropriate to secure to the commonwealth the benefits of the Federal Water Pollution Control Act..."
 - (5)"Adopt standards of minimum water quality which shall be applicable to the various waters or portions of waters of the commonwealth."

Holyoke Gas & Electric Department
Administrative Consent Order

(6)"Prescribe effluent limitations, permit programs, and procedures applicable to the management and disposal of pollutants, including, where appropriate, prohibition of discharges."

6. The Federal Clean Water Act, 33 U.S.C. § 1341 provides:

"Any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate..., that any such discharge will comply with the applicable provisions sections 1311, 1312, 1313, 1316, and 1317 of this title."

7. The 401 Water Quality Certification Regulations at 314 CMR 9.09 provide in relevant part:

"The Department will certify in writing to the appropriate federal agency and to the applicant whether or not the proposed project will meet applicable water quality standards and minimize environmental impacts through compliance with 314 C.M.R. 4.00 as implemented and supplemented by 314 C.M.R. 9.00 ... The certification or denial will contain: ... any conditions deemed necessary by the Department to insure maintenance or attainment of water quality, minimization of any damage to the environment which may result from the project, or compliance with any applicable provisions of Massachusetts law which the Department is authorized administer ..."

8. The 401 Water Quality Certification Regulations at 314 CMR 9.11 provide that failure to comply with 314 CMR 9.00 or a 401 Water Quality Certification shall be enforced as provided in G.L. c. 21, §§ 42 and 44, G.L. c. 21, § 16A and 310 CMR 5.00.

9. The Department issued a combined 401 Water Quality Certification (WQC) to competing applicants for a FERC new license for the Holyoke Dam Hydroelectric Power Project No. 2004 (Project) to Northeast Utilities Service Co. as agent for Holyoke Water Power (HWP) and HG&E, among other entities, on July 28, 1999.

10. On August 18, 1999, HWP filed a Request for An Adjudicatory Hearing on the WQC.

11. On August 20, 1999 FERC issued a new license to HWP incorporating the July 28, 1999 WQC. In September of 1999 several requests for rehearing of the new FERC license were filed.

12. On February 14, 2001, the Department issued a final WQC (2001 WQC) for the Holyoke Project based on settlement reached by all parties involved in the state administrative appeal. The 2001 WQC for the Project was filed at FERC on March 19, 2001.

13. On September 20, 2001, FERC issued an order approving transfer of the license for the Project from HWP to HG&E. To date, requests for rehearing on the new license are pending at FERC (note that certain requests were withdrawn as part of the transfer of the license for the Project from HWP to HG&E) and FERC has not yet acted on the Department's 2001 WQC.

14. The Department has participated in settlement negotiations with HG&E and the parties on the pending requests for rehearing (hereinafter the parties involved in the settlement

Holyoke Gas & Electric Department
Administrative Consent Order

negotiations, including the Department, collectively referred to as the "Settlement Parties"). In addition, the Department has issued letters granting extensions of time to HG&E under the 2001 WQC dated January 10, 2003; October 6, 2003; and January 21, 2004.

15. The Settlement Parties executed a Settlement Agreement for the Project that HG&E filed with FERC on March 12, 2004 (Settlement Agreement). The Settlement Agreement resolves all issues presented in the requests for rehearing of the FERC license and addresses many requirements contained in the 2001 WQC.

16. The Department alleges that HG&E has not completed the following requirements within timeframes established by the relevant 2001 WQC conditions, but HG&E's December 26, 2003 written request to extend the stated due dates is pending at the Department: (i) submission of a Permanent Bypass Flow Plan to the Department on or before September 15, 2003 (Condition 11(d)(2)); (ii) modification of both fishlift facilities for operation to 40,000 cfs on or before November 30, 2003 (Condition 14(a)(1)); (iii) submission of a Louver Effectiveness Study Report to the Department on or before January 31, 2003 (Condition 14(c)(1)); and (iv) submission of a plan for downstream passage of Shortnose Sturgeon to the Department before December 31, 2003 (Condition 14(k)).

17. The Department alleges that HG&E's failure to complete the actions listed above as required by the 2001 WQC is a violation of the Massachusetts Clean Waters Act, G.L. c. 21, §§ 26-53 and the 401 Water Quality Certification Regulations, 314 CMR 9.09 and 314 CMR 9.11.

III. Disposition and Order

18. Based upon the foregoing Statement of Facts and Law, and pursuant to its authority under G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 4.00, 314 CMR 9.00, and G.L. c. 21A, § 16 and the regulations promulgated thereunder at 310 CMR 5.00, the Department hereby issues, and HG&E hereby consents to the following order:

19. As stated in HG&E's pending request for extension of time and consistent with the Settlement Agreement, HG&E shall submit: (i) the Permanent Bypass Flow Plan to the Department on or before December 31, 2004 (Condition 11(d)(2)); (ii) complete modification of both fishlift facilities for operation 40,000 cfs on or before April 5, 2005 (Condition 14(a)(1)); (iii) submit the Louver Effectiveness Study Report to the Department on or before July 1, 2004 (Condition 14(c)(1)); and (iv) submit plans for downstream passage of Shortnose Sturgeon as required by Section 4.7 and Appendix F of the Settlement Agreement.

20. HG&E shall comply with all of the terms and conditions of the Settlement Agreement (that refer to, relate to or otherwise implement requirements contained in the 2001 WQC) and shall comply with all of the terms and conditions of the 2001 WQC that have not been extended or otherwise addressed by the Department in writing on January 10, 2003; October 6, 2003 and January 21, 2004, or through this Administrative Consent Order. Attached is a copy of Appendix B to the Settlement Agreement which illustrates the correlation between the Conditions in the 2001 WQC and the provisions of the Settlement Agreement.

21. In addition to being an Administrative Consent Order, this Order is also a Notice of Noncompliance issued pursuant to G.L. c. 21A, § 16 for HG&E's noncompliance with the Massachusetts Clean Waters Act, G.L. c. 21, §§ 26-53 and the 401 Water Quality Certification Regulations, as identified in Article II above. However, the Department agrees not to pursue civil

Holyoke Gas & Electric Department
Administrative Consent Order

administrative or any other penalties for any such noncompliance listed in Article II above or for any past noncompliance with respect to requirements in the 2001 WQC to the extent such requirements are specifically addressed in the Settlement Agreement provided HG&E fully complies with this Administrative Consent Order. Future violations of the 2001 WQC or the Settlement Agreement (to the extent that any such violation of the Settlement Agreement refers to, relates to or otherwise implements requirements contained in the 2001 WQC), including any subsequent modifications of the 2001 WQC and/or the Settlement Agreement (that refer to, relate to or otherwise implement requirements contained in the 2001 WQC) agreed to in writing by the Department, or of this Administrative Consent Order may result, without limitation, in the assessment of civil administrative penalties for each day, or portion thereof, each such violation occurs or continues.

22. Submittals required by this Administrative Consent Order shall be considered delivered upon receipt by the Department. All submissions required by this Administrative Consent order shall be submitted to:

Robert Kubit
FERC Coordinator
Division of Watershed Management
Department of Environmental Protection
Central Regional Office
627 Main Street
Worcester, Massachusetts 01608
&
Robert J. McCollum
Wetland Program Chief
Department of Environmental Protection
Western Regional Office
436 Dwight Street
Springfield, Massachusetts 01103

23. HG&E admits to the jurisdiction and authority of the Department to issue this Administrative Consent Order. HG&E understands and hereby waives its right to an adjudicatory hearing before the Department on, and judicial review of, the issuance and/or terms of this Administrative Consent Order and to notice of any such rights of review.

24. Except as expressly provided in this Order, nothing in this Administrative Consent Order shall be construed or operate as barring, diminishing, adjudicating, or in any way affecting: (1) any legal or equitable right of the Department to issue any future order with respect to the subject matter covered by this Administrative Consent Order, or (2) any other legal or equitable right of the Department to pursue any claim, action, suit, cause of action, demand or right to relief that the Department may have with respect to the subject matter covered by this Administrative Consent Order. This Administrative Consent Order shall not be construed as or operate as barring, diminishing, or adjudicating or in any way affecting any legal or equitable right of the Department with respect to any subject matter not covered by this Administrative Consent Order.

25. This Administrative Consent Order shall apply to and be binding upon HG&E, its officers, employees, agents, consultants, contractors, successors, and assigns. HG&E shall not violate this Administrative Consent Order and shall not allow or suffer its officers, employees, agents, consultants, contractors, successors, or assigns to violate this Administrative Consent

Holyoke Gas & Electric Department
Administrative Consent Order

Order. A violation of this Administrative Consent Order by any of the foregoing shall constitute a violation of this Administrative Consent Order by HG&E.

26. Except as provided herein, this Administrative Consent Order does not relieve HG&E or any other person of the necessity of complying with all applicable federal, state, and local statutes, regulations and approvals while performing activities pursuant to this Administrative Consent Order. Except as provided herein, any noncompliance with the foregoing shall constitute a violation of this Administrative Consent Order.

27. Failure on the part of the Department to complain of action or inaction on the part of HG&E shall not constitute a waiver by the Department of any rights under this Administrative Consent Order, nor shall a waiver by the Department of any provision of this Administrative Consent Order be construed as a waiver of any other provision of this Administrative Consent Order.

28. This Administrative Consent Order may be modified only by the written agreement of the parties. This Administrative Consent Order and the obligations hereunder may not be assigned by HG&E, except with the written consent of the Department.

29. In addition to all other inspection rights of the Department, HG&E shall allow Department personnel to enter and inspect the area where it is performing any work under this Administrative Consent Order and/or any work required by the 2001 WQC for the Project at reasonable times and with reasonable notice for the purpose of assessing HG&E compliance with this Administrative Consent Order, the Massachusetts Clean Waters Act, the Massachusetts Surface Water Quality Standards, and the 401 Water Quality Certification Regulations. In addition the Department shall have the right to inspect and copy documents related to work required by the Administrative Consent Order and/or the 2001 WQC at reasonable times, during normal business hours, and without notice for the purpose of assessing HG&E compliance with this Administrative Consent Order, the Massachusetts Clean Waters Act, the Massachusetts Surface Water Quality Standards, and the 401 Water Quality Certification Regulations. Whether any documents which are copied by the Department would be exempt from the requirements of M.G.L. Chapter 66, Section 10 (the "Public Records Law") shall be determined in accordance with the provisions of the Public Records Law, 310 CMR 3.00 and all other applicable laws and regulations.

30. The provisions of this Administrative Consent Order are severable and if any provision of this Administrative Consent Order or the application thereof is held invalid or unenforceable, such invalidity or unenforceability shall not affect the validity or enforceability of any other provision of this Consent Order which shall be given full effect without the invalid or unenforceable provision provided, however, that the Department may, in its sole discretion, elect to void the entire Administrative Consent Order in the event of such invalidity or unenforceability.

31. This Administrative Consent Order constitutes the entire understanding and agreement between the Department and HG&E with regard to HG&E obligations arising out of the subject matter of this Administrative Consent Order.

32. The undersigned represent that he/she has the authority to sign this Administrative Consent Order and to legally bind himself/herself and/or the party on whose behalf such

Holyoke Gas & Electric Department
Administrative Consent Order

representative is signing. This Administrative Consent Order shall take effect on the date that it is signed by the Department.

33. This Administrative Consent Order may be executed in one or more counterparts, all of which shall be considered one and the same Administrative Consent Order.

CONSENTED TO:

City of Holyoke Gas & Electric Department

By: James M. Lavelle
Typed Name: James M. Lavelle
Title: Manager

Date: 4/2/04

HG&E Federal Employer Identification

Number: EO4-600-1393

SO ORDERED:

Department of Environmental Protection

By: Michael J. Gorski
Typed Name: Michael J. Gorski
Title: Regional Director

Date: 4/2/04

Holyoke Gas & Electric Department
 Administrative Consent Order
 Attachment

Holyoke Project, FERC No. 2004
Appendix B to Settlement Agreement
Illustrating the Correlation Between the Conditions in 2001 Water
Quality Certification and Provisions of the Settlement Agreement

2001 WQC Condition No.	2001 WQC Provision	Parallel Provision in the Settlement Agreement
WQC 1-8	Compliance	No change in Settlement
WQC 9	Run-of-River	Section 4.1
WQC 10	Rubber Dam	Installed 11/01; no change in Settlement
WQC 11	Bypass Reach Flows	Section 4.2
WQC 12	Project Flows	Section 4.4
WQC 13	Canal Operations	Sections 4.3 and 4.6
WQC 14	Fish Passage Facilities	Sections 4.5 and 4.6 [upstream fish passage]; Section 4.7 [downstream fish passage]; Section 4.8 [eel passage]; Section 4.9 [construction plans]; Sections 4.3(f)-(g) [full depth louvers and exclusion racks]
WQC 15	Holyoke Fishway Monitoring Scope of Work	Section 4.6(e)
WQC 16	Access to the Project	Not to be addressed in Settlement
WQC 17	Cooperative Research/Management Activities	Not to be addressed in Settlement
WQC 18	Moratorium	See Sections 4.6 and 4.7, otherwise not to be addressed in Settlement
WQC 19	Riparian Management Plan	Section 4.11(h).
WQC 20	Sale of Land Within Riparian Zone	Not to be addressed in Settlement
WQC 21	Additional Plans	Section 4.11(c) [Threatened and Endangered Species Plan]; Section 4.11(d) [Invasive Species Monitoring Plan]
WQC 22	Water Sampling Standard Operating Procedures	Section 4.11(b) [Water Quality Monitoring Plan]
WQC 23	Force Majeure	See Section 9.1, otherwise not to be addressed in Settlement

Submission Contents

Supplement to Offer of Settlement of City of Holyoke Gas & Electric Department
under P-2004
supplement.pdf..... 1-13

LAW OFFICES OF
GKRSE

1500 K STREET, NW ♦ SUITE 330 ♦ WASHINGTON, DC 20005

202.408.5400 ♦ FAX: 202.408.5406 ♦ WEBSITE: www.gkrse-law.com

April 19, 2006

Ms. Magalie Roman Salas
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Filed Electronically

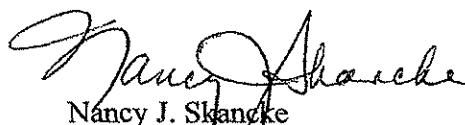
Re: The City of Holyoke Gas & Electric Department
No. 4 Project, FERC No. 7758
Application for License -- Supplement

Dear Ms. Salas:

On February 25, 2005, the City of Holyoke Gas & Electric Department ("HG&E") filed its Application for License for the Holyoke No. 4 Project (Project No. 7758). By letter dated April 10, 2006, the Massachusetts Department of Environmental Protection ("MADEP") granted a waiver of the requirement to obtain a Section 401 Water Quality Certification for that Project. A copy of the MADEP's April 10th letter is attached hereto for filing as a supplement to the Application for License for the Holyoke No. 4 Project.

If there are any questions concerning this matter, please contact the undersigned.

Respectfully submitted,



Nancy J. Skancke
Counsel for the City of Holyoke Gas
& Electric Department

Enclosure

cc: All parties on FERC's official service list for Project No. 7758 (w/ encl.)
J. Hannula, FERC (w/ encl.)

P. Ducheney, HG&E (w/o encl.)
J. Lavelle, HG&E (w/o encl.)



**COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WESTERN REGIONAL OFFICE**

436 Dwight Street • Springfield, Massachusetts 01103 • (413) 784-1100 • FAX (413) 784-1149

MITT ROMNEY
Governor

KERRY HEALEY
Lieutenant Governor

STEPHEN R. PRITCHARD
Secretary

ROBERT W. GOLLEDGE, Jr.
Commissioner

Paul Ducheny
City of Holyoke Gas & Electric Department
99 Suffolk Street
Holyoke MA 01040-5082

April 10, 2006

Re: Holyoke No. 4 Project (FERC Project No. 7758)
Request for Waiver of Water Quality Certification

Dear Mr. Ducheny,

The Massachusetts Department of Environmental Protection (the Department) is in receipt of your February 24, 2006 letter requesting a waiver of State 401 Water Quality Certification requirements for the Holyoke No. 4 Project (FERC Project No. 7758). This project is located within the Holyoke Canal System.

After consultation with the Massachusetts Division of Fisheries and Wildlife and Department staff it is the Department's opinion that the requirement for State 401 Water Quality Certification for this project be waived, contingent upon project execution in a manner consistent with the State 401 Water Quality Certification as issued for the Holyoke Dam Project (FERC No. 2004) and subsequent Settlement Agreement. This decision is based upon the fact that the Water Quality Certificate issued and subsequent Settlement Agreement for the Holyoke Dam Project (FERC No. 2004) specify all the conditions necessary to meet State water quality standards for the Holyoke No. 4 Project (FERC Project No. 7758).

This information is available in alternate format. Call Donald M. Gomes, ADA Coordinator at 617-556-1057. TDD Service - 1-800-298-2207.

MassDEP on the World Wide Web: <http://www.state.ma.us/dep>



Printed on Recycled Paper

If you have any questions, please contact Robert J. McCollum at 413-755-2138.

Sincerely,



Steven Ellis
Acting Regional Director

CERTIFIED MAIL 7005 1160 0003 7959 8339, return receipt requested

Cc:

Nancy Skancke/GKRSE
Deirdre Desmond/DEP/OGC
Lisa Jones/DEP/BWSC
Janice Stone/South Hadley Con Com
Pasquale Scida/NMFS
Robert Kubit/DWM
Paul Hogan/DWM
Caleb Slater/MDF&G
John Warner/USF&WS
Donald Pugh/Trout Unlimited
Chelsea Gwyther/CRWC
Andrea F. Donlon/CRWC
Patricia Vinchesi



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Watershed Management, 627 Main Street 2nd Floor, Worcester, MA 01608

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

May 14, 2009

Richard Murray
City of Holyoke Gas & Electric Department
99 Suffolk Street
Holyoke MA 01040-5082

RE: FERC Project No. 2772, 2775, 2771, 2487, 2768, 2766, 2758, 2770

Dear Mr. Murray,

The Massachusetts Department of Environmental Protection has received your request for water quality certifications for FERC Project No. 2772, Gillmill A; FERC Project No. 2775, Gillmill D; FERC Project No. 2771, Nonotuck; FERC Project No. 2497, Mt. Tom Mill; FERC Project No. 2768, Albion Mill A; FERC Project No. 2766, Albion Mill D; FERC Project No. 2758, Crocker Mill and FERC Project No. 2770, Crocker Mill C. A

Please note that within the water quality certification issued for FERC Project No. 2004, are conditions that require compliance for operations and flows within the Holyoke canal system. All eight Projects listed above are located within the Holyoke canal system. We consider the recently issued water quality certification for FERC Project 2004 to apply to these eight Projects.

Please call me at 508/767-2854 if there are any questions.

Sincerely,

Robert Kubit, P.E.
Environmental Engineer





COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Watershed Management, 627 Main Street 2nd Floor, Worcester, MA 01608

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

Richard Murray
City of Holyoke Gas & Electric Department
99 Suffolk Street
Holyoke MA 01040-5082

May 25, 2010

RE: FERC Project No. 2386, 2387, 2388, 10806

Dear Mr. Murray,

The Massachusetts Department of Environmental Protection has received your request for water quality certifications for FERC Project No. 2386, Holyoke 1; FERC Project No. 2387, Holyoke 2; FERC Project No. 2388, Holyoke 3 and FERC Project No. 10806, Valley.

Please note that within the water quality certification issued for FERC Project No. 2004, are conditions that require compliance for operations and flows within the Holyoke canal system. All four Projects listed above are located within the Holyoke canal system. We consider the recently issued water quality certification for FERC Project 2004 to apply to these four Projects.

Please call me at 508/767-2854 if there are any questions.

Sincerely,

Robert Kubit, P.E.
Environmental Engineer



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC UTILITY CONTROL
TEN FRANKLIN SQUARE
NEW BRITAIN, CT 06051

DOCKET NO. 04-01-28RE01

APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF BEEBE
HOLBROOK AS A CLASS II RENEWABLE
ENERGY SOURCE - REOPENER

November 23, 2005

By the following Commissioners:

Anne C. George
Anthony J. Palermino
John W. Betkoski, III

DECISION

I. INTRODUCTION

A. SUMMARY

In this Decision, the Department of Public Utility Control (Department) determines that the Beebe Holbrook generating facility qualifies as a Class II renewable energy source as a run-of-the-river hydroelectric facility and assigns it Connecticut Renewable Portfolio Standard (RPS) Registration Number CT00099-04.

B. BACKGROUND OF THE PROCEEDING

By application dated January 26, 2004, the Holyoke Gas & Electric Department (HG&E) requested that the Department determine that the Beebe Holbrook generation facility qualifies as a Class II renewable energy source. Beebe Holbrook is a run-of-the-river hydroelectric facility located in Holyoke, MA that began commercial operation on January 1, 1948 with a nameplate capacity of .516 MW. Application, pp. 1 and 2.

(2) The “generating capacity of not more than five megawatts” refers to a hydroelectric facility’s nameplate capacity, not its actual or average generation output;

(3) In order to qualify as “run-of-the-river,” a hydroelectric facility must show a current FERC license or exemption that requires the facility to operate in run-of-the-river mode. In addition, a facility can qualify as a Class I or Class II renewable energy facility only to the extent that its FERC license or exemption requires run-of-river operation. Hydroelectric facilities that are not regulated by FERC will be required to show a FERC order or a court decision stating that FERC has no jurisdiction, or has declined to exercise jurisdiction, over such facility. In such cases, the hydroelectric facility must show that its operation allows the river inflow to equal outflow instantaneously and, therefore, does not cause an appreciable change in the river flow; and

(4) “Began operations” means (A) the date an existing facility with existing generation began commercial operation as shown in documentation from FERC; (B) the new date given to an abandoned or destroyed facility that comes back into operation as shown in its documentation from FERC or as determined by the Department; (C) the date upon which a facility changes operation from store and release to run-of-the-river as shown in documentation from FERC; or (D) the new date that incremental generation is in operation at an existing facility as shown in its documentation from FERC.

See Docket No. 04-02-07, DPUC Declaratory Ruling Concerning “Run-of-the-River Hydropower” as That Term is Used in the Definitions of Class I and Class II Renewable Energy Source in C.G.S. §16-1(a)(26) &(27).

As provided in the application, Beebe Holbrook is a hydroelectric facility located at 388 Dwight Street, Holyoke, MA. Beebe Holbrook is currently owned by HG&E. According to HG&E, there are two turbine generators at this facility, with a total nameplate capacity of .516 MW. Application, p. 2; FERC Order p. 44. FERC issued a license to Beebe Holbrook. FERC Order, p. 40 et al. Within the license, FERC ordered that Beebe Holbrook shall operate in a run-of-river mode. Id. Article 405, p. 55. Beebe Holbrook began operations January 1, 1948. Application, p. 2.

Based on the foregoing, the Department determines that Beebe Holbrook qualifies as a Class II renewable energy facility.

III. FINDINGS OF FACT

1. Beebe Holbrook is a hydroelectric facility located in Holyoke, MA.
2. Beebe Holbrook is currently owned by the Holyoke Gas & Electric Department.
3. In FERC Order Issuing New License and Denying Competing License Application dated August 20, 1999, the FERC issued a license to Beebe Holbrook.
4. Within the license, FERC ordered that Beebe Holbrook shall operate in a run-of-river mode.

DOCKET NO. 04-01-28RE01 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF BEEBE
HOLBROOK AS A CLASS II RENEWABLE ENERGY
SOURCE - REOPENER

This Decision is adopted by the following Commissioners:

Anne C. George

Anthony J. Palermino

John W. Betkoski, III

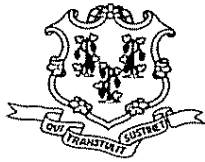
CERTIFICATE OF SERVICE

The foregoing is a true and correct copy of the Decision issued by the Department of Public Utility Control, State of Connecticut, and was forwarded by Certified Mail to all parties of record in this proceeding on the date indicated.

Louise E. Rickard

Louise E. Rickard
Acting Executive Secretary
Department of Public Utility Control

November 23, 2005
Date



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC UTILITY CONTROL
TEN FRANKLIN SQUARE
NEW BRITAIN, CT 06051

DOCKET NO. 04-01-29RE01

APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF
BOATLOCK AS A CLASS II RENEWABLE
ENERGY SOURCE - REOPENER

November 23, 2005

By the following Commissioners:

Anne C. George
Anthony J. Palermino
John W. Betkoski, III

DECISION

I. INTRODUCTION

A. SUMMARY

In this Decision, the Department of Public Utility Control (Department) determines that the Boatlock generating facility qualifies as a Class II renewable energy source as a run-of-the-river hydroelectric facility and assigns it Connecticut Renewable Portfolio Standard (RPS) Registration Number CT00100-04.

B. BACKGROUND OF THE PROCEEDING

By application dated January 26, 2004, the Holyoke Gas & Electric Department (HG&E) requested that the Department determine that the Boatlock generation facility qualifies as a Class II renewable energy source. Boatlock is a run-of-the-river hydroelectric facility located in Holyoke, MA that began commercial operation on January 1, 1924 with a nameplate capacity of 2.9 MW. Application, pp. 1 and 2.

(2) The “generating capacity of not more than five megawatts” refers to a hydroelectric facility’s nameplate capacity, not its actual or average generation output;

(3) In order to qualify as “run-of-the-river,” a hydroelectric facility must show a current FERC license or exemption that requires the facility to operate in run-of-the-river mode. In addition, a facility can qualify as a Class I or Class II renewable energy facility only to the extent that its FERC license or exemption requires run-of-river operation. Hydroelectric facilities that are not regulated by FERC will be required to show a FERC order or a court decision stating that FERC has no jurisdiction, or has declined to exercise jurisdiction, over such facility. In such cases, the hydroelectric facility must show that its operation allows the river inflow to equal outflow instantaneously and, therefore, does not cause an appreciable change in the river flow; and

(4) “Began operations” means (A) the date an existing facility with existing generation began commercial operation as shown in documentation from FERC; (B) the new date given to an abandoned or destroyed facility that comes back into operation as shown in its documentation from FERC or as determined by the Department; (C) the date upon which a facility changes operation from store and release to run-of-the-river as shown in documentation from FERC; or (D) the new date that incremental generation is in operation at an existing facility as shown in its documentation from FERC.

See Docket No. 04-02-07, DPUC Declaratory Ruling Concerning “Run-of-the-River Hydropower” as That Term is Used in the Definitions of Class I and Class II Renewable Energy Source in C.G.S. §16-1(a)(26) &(27).

As provided in the application, Boatlock is a hydroelectric facility located at 28 Gatehouse Road, Holyoke, MA. Boatlock is currently owned by HG&E. According to HG&E, there are three turbine generators at this facility, with a total nameplate capacity of 2.9 MW. Application, p. 2; FERC Order p. 43. FERC issued a license to Boatlock. FERC Order, p. 40 et al. Within the license, FERC ordered that Boatlock shall operate in a run-of-river mode. Id. Article 405, p. 55. Boatlock began operations January 1, 1924. Application, p. 2.

Based on the foregoing, the Department determines that Boatlock qualifies as a Class II renewable energy facility.

III. FINDINGS OF FACT

1. Boatlock is a hydroelectric facility located in Holyoke, MA.
2. Boatlock is currently owned by the Holyoke Gas & Electric Department.
3. In FERC Order Issuing New License and Denying Competing License Application dated August 20, 1999, the FERC issued a license to Boatlock.
4. Within the license, FERC ordered that Boatlock shall operate in a run-of-river mode.

DOCKET NO. 04-01-29RE01 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF
BOATLOCK AS A CLASS II RENEWABLE ENERGY
SOURCE - REOPENER

This Decision is adopted by the following Commissioners:

Anne C. George

Anthony J. Palermino

John W. Betkoski, III

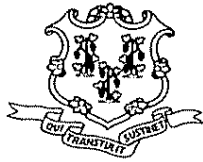
CERTIFICATE OF SERVICE

The foregoing is a true and correct copy of the Decision issued by the Department of Public Utility Control, State of Connecticut, and was forwarded by Certified Mail to all parties of record in this proceeding on the date indicated.

Louise E. Rickard

Louise E. Rickard
Acting Executive Secretary
Department of Public Utility Control

November 23, 2005
Date



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC UTILITY CONTROL
TEN FRANKLIN SQUARE
NEW BRITAIN, CT 06051

DOCKET NO. 04-01-30RE01 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF
CHEMICAL AS A CLASS II RENEWABLE ENERGY
SOURCE - REOPENER

November 23, 2005

By the following Commissioners:

Anne C. George
Anthony J. Palermino
John W. Betkoski, III

DECISION

I. INTRODUCTION

A. SUMMARY

In this Decision, the Department of Public Utility Control (Department) determines that the Chemical generating facility qualifies as a Class II renewable energy source as a run-of-the-river hydroelectric facility and assigns it Connecticut Renewable Portfolio Standard (RPS) Registration Number CT00101-04.

B. BACKGROUND OF THE PROCEEDING

By application dated January 26, 2004, the Holyoke Gas & Electric Department (HG&E) requested that the Department determine that the Chemical generating facility qualifies as a Class II renewable energy source. Chemical is a run-of-the-river

(1) "Facility" refers to an entire hydroelectric plant at a single site rather than a turbine generating unit within a hydroelectric plant;

(2) The "generating capacity of not more than five megawatts" refers to a hydroelectric facility's nameplate capacity, not its actual or average generation output;

(3) In order to qualify as "run-of-the-river," a hydroelectric facility must show a current FERC license or exemption that requires the facility to operate in run-of-the-river mode. In addition, a facility can qualify as a Class I or Class II renewable energy facility only to the extent that its FERC license or exemption requires run-of-river operation. Hydroelectric facilities that are not regulated by FERC will be required to show a FERC order or a court decision stating that FERC has no jurisdiction, or has declined to exercise jurisdiction, over such facility. In such cases, the hydroelectric facility must show that its operation allows the river inflow to equal outflow instantaneously and, therefore, does not cause an appreciable change in the river flow; and

(4) "Began operations" means (A) the date an existing facility with existing generation began commercial operation as shown in documentation from FERC; (B) the new date given to an abandoned or destroyed facility that comes back into operation as shown in its documentation from FERC or as determined by the Department; (C) the date upon which a facility changes operation from store and release to run-of-the-river as shown in documentation from FERC; or (D) the new date that incremental generation is in operation at an existing facility as shown in its documentation from FERC.

See Docket No. 04-02-07, DPUC Declaratory Ruling Concerning "Run-of-the-River Hydropower" as That Term is Used in the Definitions of Class I and Class II Renewable Energy Source in C.G.S. §16-1(a)(26) &(27).

As provided in the application, Chemical is a hydroelectric facility located at 228 South Water Street, Holyoke, MA. Chemical is currently owned by HG&E. According to HG&E, there are two turbine generators at this facility, with a total nameplate capacity of 1.6 MW. Application, p. 2; FERC Order p. 44. FERC issued a license to Chemical. FERC Order, p. 40 et al. Within the license, FERC ordered that Chemical shall operate in a run-of-river mode. Id. Article 405, p. 55. Chemical began operations January 1, 1935. Application, p. 2.

Based on the foregoing, the Department determines that Chemical qualifies as a Class II renewable energy facility.

III. FINDINGS OF FACT

1. Chemical is a hydroelectric facility located in Holyoke, MA.
2. Chemical is currently owned by the Holyoke Gas & Electric Department.
3. In FERC Order Issuing New License and Denying Competing License Application dated August 20, 1999, the FERC issued a license to Chemical.

DOCKET NO. 04-01-30RE01 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF
CHEMICAL AS A CLASS II RENEWABLE ENERGY
SOURCE - REOPENER

This Decision is adopted by the following Commissioners:

Anne C. George

Anthony J. Palermino

John W. Betkoski, III

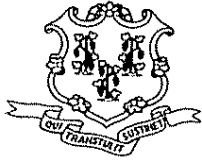
CERTIFICATE OF SERVICE

The foregoing is a true and correct copy of the Decision issued by the Department of Public Utility Control, State of Connecticut, and was forwarded by Certified Mail to all parties of record in this proceeding on the date indicated.

Louise E. Rickard

Louise E. Rickard
Acting Executive Secretary
Department of Public Utility Control

November 23, 2005
Date



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC UTILITY CONTROL
TEN FRANKLIN SQUARE
NEW BRITAIN, CT 06051

DOCKET NO. 04-01-32RE01

APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF
RIVERSIDE 4-7 AS A CLASS II RENEWABLE
ENERGY SOURCE - REOPENER

November 23, 2005

By the following Commissioners:

Anne C. George
Anthony J. Palermino
John W. Betkoski, III

DECISION

I. INTRODUCTION

A. SUMMARY

In this Decision, the Department of Public Utility Control (Department) determines that the Riverside 4-7 generating facility qualifies as a Class II renewable energy source as a run-of-the-river hydroelectric facility and assigns it Connecticut Renewable Portfolio Standard (RPS) Registration Number CT00103-04.

B. BACKGROUND OF THE PROCEEDING

By application dated January 26, 2004, the Holyoke Gas & Electric Department (HG&E) requested that the Department determine that the Riverside 4-7 generating facility qualifies as a Class II renewable energy source. Riverside 4-7 is a run-of-the-river hydroelectric facility located in Holyoke, MA that began commercial operation on January 1, 1921 with a nameplate capacity of 3.04 MW. Application, pp. 1 and 2.

(1) "Facility" refers to an entire hydroelectric plant at a single site rather than a turbine generating unit within a hydroelectric plant;

(2) The "generating capacity of not more than five megawatts" refers to a hydroelectric facility's nameplate capacity, not its actual or average generation output;

(3) In order to qualify as "run-of-the-river," a hydroelectric facility must show a current FERC license or exemption that requires the facility to operate in run-of-the-river mode. In addition, a facility can qualify as a Class I or Class II renewable energy facility only to the extent that its FERC license or exemption requires run-of-river operation. Hydroelectric facilities that are not regulated by FERC will be required to show a FERC order or a court decision stating that FERC has no jurisdiction, or has declined to exercise jurisdiction, over such facility. In such cases, the hydroelectric facility must show that its operation allows the river inflow to equal outflow instantaneously and, therefore, does not cause an appreciable change in the river flow; and

(4) "Began operations" means (A) the date an existing facility with generation began commercial operation as shown in documentation from FERC; (B) the new date given to an abandoned or destroyed facility that comes back into operation as shown in its documentation from FERC or as determined by the Department; (C) the date upon which a facility changes operation from store and release to run-of-the-river as shown in documentation from FERC; or (D) the new date that incremental generation is in operation at an existing facility as shown in its documentation from FERC.

See Docket No. 04-02-07, DPUC Declaratory Ruling Concerning "Run-of-the-River Hydropower" as That Term is Used in the Definitions of Class I and Class II Renewable Energy Source in C.G.S. §16-1(a)(26) &(27).

As provided in the application, Riverside 4-7 is a hydroelectric facility located at 30 Water Street, Holyoke, MA. Riverside 4-7 is currently owned by HG&E. According to HG&E, there are four turbine generators at this facility, with a total nameplate capacity of 3.04 MW. Application, p. 2; FERC Order p. 44. FERC issued a license to Riverside 4-7. FERC Order, p. 40 et al. Within the license, FERC ordered that Riverside 4-7 shall operate in a run-of-river mode. Id. Article 405, p. 55. Riverside 4-7 began operations January 1, 1921. Application, p. 2.

Based on the foregoing, the Department determines that Riverside 4-7 qualifies as a Class II renewable energy facility.

III. FINDINGS OF FACT

1. Riverside 4-7 is a hydroelectric facility located in Holyoke, MA.
2. Riverside 4-7 is currently owned by the Holyoke Gas & Electric Department.
3. In FERC Order Issuing New License and Denying Competing License Application dated August 20, 1999, the FERC issued a license to Riverside 4-7.

DOCKET NO. 04-01-32RE01 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF
RIVERSIDE 4-7 AS A CLASS II RENEWABLE
ENERGY SOURCE - REOPENER

This Decision is adopted by the following Commissioners:

Anne C. George

Anthony J. Palermino

John W. Betkoski, III

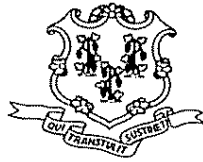
CERTIFICATE OF SERVICE

The foregoing is a true and correct copy of the Decision issued by the Department of Public Utility Control, State of Connecticut, and was forwarded by Certified Mail to all parties of record in this proceeding on the date indicated.

Louise E. Rickard

Louise E. Rickard
Acting Executive Secretary
Department of Public Utility Control

November 23, 2005
Date



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC UTILITY CONTROL
TEN FRANKLIN SQUARE
NEW BRITAIN, CT 06051

DOCKET NO. 04-01-33RE01 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF
RIVERSIDE 8 AS A CLASS II RENEWABLE
ENERGY SOURCE - REOPENER

November 23, 2005

By the following Commissioners:

Anne C. George
Anthony J. Palermino
John W. Betkoski, III

DECISION

I. INTRODUCTION

A. SUMMARY

In this Decision, the Department of Public Utility Control (Department) determines that the Riverside 8 generating facility qualifies as a Class II renewable energy source as a run-of-the-river hydroelectric facility and assigns it Connecticut Renewable Portfolio Standard (RPS) Registration Number CT00104-04.

B. BACKGROUND OF THE PROCEEDING

By application dated January 26, 2004, the Holyoke Gas & Electric Department (HG&E) requested that the Department determine that the Riverside 8 generating facility qualifies as a Class II renewable energy source. Riverside 8 is a run-of-the-river hydroelectric facility located in Holyoke, MA that began commercial operation on January 1, 1931 with a nameplate capacity of 4 MW. Application, pp. 1 and 2.

(1) "Facility" refers to an entire hydroelectric plant at a single site rather than a turbine generating unit within a hydroelectric plant;

(2) The "generating capacity of not more than five megawatts" refers to a hydroelectric facility's nameplate capacity, not its actual or average generation output;

(3) In order to qualify as "run-of-the-river," a hydroelectric facility must show a current FERC license or exemption that requires the facility to operate in run-of-the-river mode. In addition, a facility can qualify as a Class I or Class II renewable energy facility only to the extent that its FERC license or exemption requires run-of-river operation. Hydroelectric facilities that are not regulated by FERC will be required to show a FERC order or a court decision stating that FERC has no jurisdiction, or has declined to exercise jurisdiction, over such facility. In such cases, the hydroelectric facility must show that its operation allows the river inflow to equal outflow instantaneously and, therefore, does not cause an appreciable change in the river flow; and

(4) "Began operations" means (A) the date an existing facility with existing generation began commercial operation as shown in documentation from FERC; (B) the new date given to an abandoned or destroyed facility that comes back into operation as shown in its documentation from FERC or as determined by the Department; (C) the date upon which a facility changes operation from store and release to run-of-the-river as shown in documentation from FERC; or (D) the new date that incremental generation is in operation at an existing facility as shown in its documentation from FERC.

See Docket No. 04-02-07, DPUC Declaratory Ruling Concerning "Run-of-the-River Hydropower" as That Term is Used in the Definitions of Class I and Class II Renewable Energy Source in C.G.S. §16-1(a)(26) &(27).

As provided in the application, Riverside 8 is a hydroelectric facility located at 30 Water Street, Holyoke, MA. Riverside 8 is currently owned by HG&E. According to HG&E, there is one turbine generator at this facility, with a total nameplate capacity of 4 MW. Application, p. 2; FERC Order p. 44. FERC issued a license to Riverside 8. FERC Order, p. 40 et al. Within the license, FERC ordered that Riverside 8 shall operate in a run-of-river mode. *Id.* Article 405, p. 55. Riverside 8 began operations January 1, 1931. Application, p. 2.

Based on the foregoing, the Department determines that Riverside 8 qualifies as a Class II renewable energy facility.

III. FINDINGS OF FACT

1. Riverside 8 is a hydroelectric facility located in Holyoke, MA.
2. Riverside 8 is currently owned by the Holyoke Gas & Electric Department.
3. In FERC Order Issuing New License and Denying Competing License Application dated August 20, 1999, the FERC issued a license to Riverside 8.

DOCKET NO. 04-01-33RE01 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF
RIVERSIDE 8 AS A CLASS II RENEWABLE
ENERGY SOURCE - REOPENER

This Decision is adopted by the following Commissioners:

Anne C. George

Anthony J. Palermino

John W. Betkoski, III

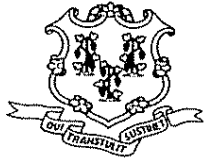
CERTIFICATE OF SERVICE

The foregoing is a true and correct copy of the Decision issued by the Department of Public Utility Control, State of Connecticut, and was forwarded by Certified Mail to all parties of record in this proceeding on the date indicated.

Louise E. Rickard

Louise E. Rickard
Acting Executive Secretary
Department of Public Utility Control

November 23, 2005
Date



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC UTILITY CONTROL
TEN FRANKLIN SQUARE
NEW BRITAIN, CT 06051

DOCKET NO. 04-01-34RE01

APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF
SKINNER AS A CLASS II RENEWABLE ENERGY
SOURCE - REOPENER

November 23, 2005

By the following Commissioners:

Anne C. George
Anthony J. Palermino
John W. Betkoski, III

DECISION

I. INTRODUCTION

A. SUMMARY

In this Decision, the Department of Public Utility Control (Department) determines that the Skinner generating facility qualifies as a Class II renewable energy source as a run-of-the-river hydroelectric facility and assigns it Connecticut Renewable Portfolio Standard (RPS) Registration Number CT00105-04.

B. BACKGROUND OF THE PROCEEDING

By application dated January 26, 2004, the Holyoke Gas & Electric Department (HG&E) requested that the Department determine that the Skinner generating facility qualifies as a Class II renewable energy source. Skinner is a run-of-the-river hydroelectric facility located in Holyoke, MA that began commercial operation on January 1, 1924 with a nameplate capacity of .3 MW. Application, pp. 1 and 2.

(2) The “generating capacity of not more than five megawatts” refers to a hydroelectric facility’s nameplate capacity, not its actual or average generation output;

(3) In order to qualify as “run-of-the-river,” a hydroelectric facility must show a current FERC license or exemption that requires the facility to operate in run-of-the-river mode. In addition, a facility can qualify as a Class I or Class II renewable energy facility only to the extent that its FERC license or exemption requires run-of-river operation. Hydroelectric facilities that are not regulated by FERC will be required to show a FERC order or a court decision stating that FERC has no jurisdiction, or has declined to exercise jurisdiction, over such facility. In such cases, the hydroelectric facility must show that its operation allows the river inflow to equal outflow instantaneously and, therefore, does not cause an appreciable change in the river flow; and

(4) “Began operations” means (A) the date an existing facility with existing generation began commercial operation as shown in documentation from FERC; (B) the new date given to an abandoned or destroyed facility that comes back into operation as shown in its documentation from FERC or as determined by the Department; (C) the date upon which a facility changes operation from store and release to run-of-the-river as shown in documentation from FERC; or (D) the new date that incremental generation is in operation at an existing facility as shown in its documentation from FERC.

See Docket No. 04-02-07, DPUC Declaratory Ruling Concerning “Run-of-the-River Hydropower” as That Term is Used in the Definitions of Class I and Class II Renewable Energy Source in C.G.S. §16-1(a)(26) &(27).

As provided in the application, Skinner is a hydroelectric facility located at 64 Bigelow Street, Holyoke, MA. Skinner is currently owned by HG&E. According to HG&E, there is one turbine generator at this facility, with a total nameplate capacity of .3 MW. Application, p. 2; FERC Order p. 44. FERC issued a license to Skinner. FERC Order, p. 40 et al. Within the license, FERC ordered that Skinner shall operate in a run-of-river mode. Id. Article 405, p. 55. Skinner began operations January 1, 1924. Application, p. 2.

Based on the foregoing, the Department determines that Skinner qualifies as a Class II renewable energy facility.

III. FINDINGS OF FACT

1. Skinner is a hydroelectric facility located in Holyoke, MA.
2. Skinner is currently owned by the Holyoke Gas & Electric Department.
3. In FERC Order Issuing New License and Denying Competing License Application dated August 20, 1999, the FERC issued a license to Skinner.
4. Within the license, FERC ordered that Skinner shall operate in a run-of-river mode.

**DOCKET NO. 04-01-34RE01 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF SKINNER
AS A CLASS II RENEWABLE ENERGY SOURCE -
REOPENER**

This Decision is adopted by the following Commissioners:

Anne C. George

Anthony J. Palermino

John W. Betkoski, III

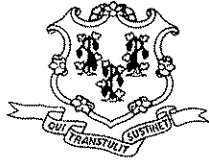
CERTIFICATE OF SERVICE

The foregoing is a true and correct copy of the Decision issued by the Department of Public Utility Control, State of Connecticut, and was forwarded by Certified Mail to all parties of record in this proceeding on the date indicated.

Louise E. Rickard

Louise E. Rickard
Acting Executive Secretary
Department of Public Utility Control

November 23, 2005
Date



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC UTILITY CONTROL
TEN FRANKLIN SQUARE
NEW BRITAIN, CT 06051

DOCKET NO. 08-04-11 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF HARRIS
ENERGY AS A CLASS II RENEWABLE ENERGY
SOURCE

June 11, 2008

By the following Commissioners:

John W. Betkoski, III
Donald W. Downes
Anne C. George

DECISION

I. INTRODUCTION

A. SUMMARY

In this Decision, the Department of Public Utility Control determines that the six Harris Energy generation facilities each qualify as run-of-the river hydropower Class II renewable energy sources and assigns each facility a separate Connecticut Renewable Portfolio Standard (RPS) Number.

B. BACKGROUND OF THE PROCEEDING

By Application (Application) received on April 10, 2008, Holyoke Gas & Electric Department (HG&E) requests, through Brian C. Beauregard, its representative, that the Department of Public Utility Control (Department) determine that six separate run-of-the-river generation facilities qualify as Class II renewable energy sources. The six facilities, Albion A, Albion D, Gill A, Gill D, Mt. Tom and Nonotuck (collectively, the Facilities or Harris Energy), are located in Holyoke, Massachusetts, and comprise Harris Energy. Application, p. 1; HG&E April 9, 2008 Letter, p. 1. The generation facilities commenced commercial operation in 1919. The facilities have the following nameplate facilities: Albion A - .281 MW; Albion D - .395 MW; Gill A - .450; Gill D - .330; Mt. Tom - .473 MW and Nonotuck - .492 MW. Application, pp. 2 and 3. Each of the facilities obtained separate FERC licenses, issued June 29, 1989. Application, Attachments A through F. HG&E requests that the Department issue each facility a separate Connecticut RPS Registration Number. HG&E April 9, 2008 Letter.

The ISO-NE Generation Unit Asset Identification Number is 12168 Harris Energy. Application, p. 2.

C. CONDUCT OF THE PROCEEDING

A hearing in this matter is not required and none was held.

D. PARTIES TO THE PROCEEDING

The Department recognized Holyoke Gas and Electric Department, 99 Sulffock Street, Holyoke, Massachusetts; and the Office of Consumer Counsel, Ten Franklin Square, New Britain, Connecticut 06051 as Participants to this proceeding.

II. DEPARTMENT ANALYSIS

A. STATUTORY REQUIREMENTS

Conn. Gen. Stat. § 16-1(a)(27) defines a class II renewable energy source, in part as: energy derived from . . . a run-of-the-river hydropower facility provide such

facility has a generating capacity of not more than five megawatts, does not cause an appreciable change in the river flow, and began operation prior to July 1, 2003.

In interpreting Conn. Gen. Stat. §16-1(a)(27), the Department has determined that:

(1) "Facility" refers to an entire hydroelectric plant at a single site rather than a turbine generating unit within a hydroelectric plant;

(2) The "generating capacity of not more than five megawatts" refers to a hydroelectric facility's nameplate capacity, not its actual or average generation output;

(3) In order to qualify as "run-of-the-river," a hydroelectric facility must show a current FERC license or exemption that requires the facility to operate in run-of-river mode. In addition, a facility can qualify as a Class I or Class II renewable energy facility only to the extent that its FERC license or exemption requires run-of-river operation. Hydroelectric facilities that are not regulated by FERC will be required to show a FERC order or a court decision stating that FERC has no jurisdiction, or has declined to exercise jurisdiction, over such facility. In such cases, the hydroelectric facility must show that its operation allows the river inflow to equal outflow instantaneously and therefore, does not cause an appreciable change in the river flow; and

(4) "Began operations" means (A) the date an existing facility with existing generation began commercial operation as shown in documentation from FERC; (B) the new date given to an abandoned or destroyed facility that comes back into operation as shown in its documentation from FERC or as determined by the Department; (C) the date upon which a facility changes operation from store and release to run-of-river as shown in documentation from FERC; or (D) the new date that incremental generation is in operation at an existing facility as shown in its documentation from FERC.¹

As provided in the application, the Facilities are hydroelectric and are located in Holyoke, Massachusetts. The Facilities are currently owned Holyoke Gas & Electric Department. According to the application and supporting documentation, the Facilities began operation in 1919 and are licensed to operate by FERC as run-of-river hydroelectric facilities. Application, FERC licenses issued June 29, 1989.

Based on the foregoing, the Department determines that the Harris Energy Facilities qualify as Class II renewable energy facilities.

III. FINDINGS OF FACT

1. Albion A, Albion D, Gill A, Gill D, Mt. Tom and Nonotuck comprise Harris Energy.
2. Albion A, Albion D, Gill A, Gill D, Mt. Tom and Nonotuck are each run-of-the-river facilities and each obtained a FERC license in June 1989.

¹ See the Department's September 10, 2004 Decision in Docket No. 04-02-07, DPUC Declaratory Ruling Concerning "Run-of the River Hydropower" as That Term is Used in the Definitions of Class I and Class II Renewable Energy Source in C.G.S. § 16-1(a)(26) & (27).

3. The total generating capacity of the Facilities is less than 5 MW.
4. Total rated capacity for the Facilities is 2.421 MW.
5. Harris Energy is connected to the ISO-NE grid.
6. The Facilities began operation prior to July 1, 2003.

IV. CONCLUSION AND ORDERS

A. CONCLUSION

Based on the evidence submitted, the Department finds that the Albion A, Albion D, Gill A, Gill D, Mt. Tom and Nonotuck each qualify as Class II renewable energy sources pursuant to Conn. Gen. Stat. 16-1(a)(27).

The Department assigns each renewable generation source a unique Connecticut RPS registration number. The Facilities Connecticut RPS registration number is as follows: Albion A – CT00266-08A ; Albion D – CT00266-08B ,Gill A – CT00266-08C ; Gill D – CT00266-08D ; Mt. Tom – CT00266-08E ; and Nonotuck – CT00266-08F.

The Department's determination in this docket is based on the information submitted by HG&E. The Department may reverse its ruling or revoke the Applicant's registration in any material information provided by the Applicant proves to be false or misleading. The Department reminds HG&E that it is obligated to notify the Department within 10 days of any changes to any of the information it has provided to the Department.

DOCKET NO. 08-04-11 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF HARRIS
ENERGY AS A CLASS II RENEWABLE ENERGY
SOURCE

This Decision is adopted by the following Commissioners:

John W. Betkoski, III

Donald W. Downes

Anne C. George

CERTIFICATE OF SERVICE

The foregoing is a true and correct copy of the Decision issued by the Department of Public Utility Control, State of Connecticut, and was forwarded by Certified Mail to all parties of record in this proceeding on the date indicated.

Louise E. Rickard

June 11, 2008

Louise E. Rickard
Acting Executive Secretary
Department of Public Utility Control

Date

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC UTILITY CONTROL
TEN FRANKLIN SQUARE
NEW BRITAIN, CT 06051

DOCKET NO. 04-01-31RE01 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF CABOT
1-4 AS A CLASS II RENEWABLE ENERGY
SOURCE - REOPENER

November 9, 2005

By the following Commissioners:

Anne C. George
Donald W. Downes
John W. Betkoski, III

DRAFT DECISION

I. INTRODUCTION

A. SUMMARY

In this Decision, the Department of Public Utility Control (Department) determines that the HGE Hydro/Cabot 1, 2, 3 and 4 generating facilities qualify as Class II renewable energy sources as run-of-the-river hydroelectric facilities and assigns them Connecticut Renewable Portfolio Standard (RPS) Registration Numbers: CT00102-04, CT00102-04(B); CT00102-04(C); and CT00102-04(D), respectively.

B. BACKGROUND OF THE PROCEEDING

By application dated January 26, 2004, the Holyoke Gas & Electric Department (HG&E) requested that the Department determine that the HE Hydro/Cabot 1-4 generation facility qualifies as a Class II renewable energy source. Application, p. 1. By letter dated September 23, 2005 (HG&E Letter), HG&E requested that the Department

issue separate registrations for each of the four Projects because each of the facilities is physically and electrically separate, and have been issued four separate Federal Energy Regulatory Commission (FERC) licenses. HG&E Letter, p. 2. The HG&E Letter identified the separate installed capacity for each of Projects 1 through 4 as being 1,056 MW, 800 MW, 450 MW and 750 MW, respectively. Id.

C. CONDUCT OF THE PROCEEDING

Pursuant to a Notice of Technical Meeting dated September 9, 2005, a Technical Meeting was held at the Department's office, Ten Franklin Square, New Britain, CT 06051. No hearing was required and none was held.

D. PARTICIPANTS IN THE PROCEEDING

The Department recognized the Holyoke Gas & Electric Department, 99 Suffolk Street, Holyoke, MA 01040, and the Office of Consumer Counsel, Ten Franklin Square, New Britain, CT 06051, as participants in this proceeding.

II. DEPARTMENT ANALYSIS

Pursuant to § 16-1(a)(27) of the General Statutes of Connecticut (Conn. Gen. Stat.), as amended by Public Act 03-135 (P.A. 03-135), An Act Concerning Revisions to the Electric Restructuring Legislation, "Class II renewable energy source" includes energy derived from a run-of-the-river hydropower facility provided such facility has a generating capacity of not more than five megawatts, does not cause an appreciable change in the river flow, and began operation prior to July 1, 2003.

In interpreting Conn. Gen. Stat. §16-1(a)(27), the Department determined that:

(1) "Facility" refers to an entire hydroelectric plant at a single site rather than a turbine generating unit within a hydroelectric plant;

(2) The "generating capacity of not more than five megawatts" refers to a hydroelectric facility's nameplate capacity, not its actual or average generation output,

(3) In order to qualify as "run-of-the-river," a hydroelectric facility must show a current FERC license or exemption that requires the facility to operate in run-of-the-river mode. In addition, a facility can qualify as a Class I or Class II renewable energy facility only to the extent that its FERC license or exemption requires run-of-river operation. Hydroelectric facilities that are not regulated by FERC will be required to show a FERC order or a court decision stating that FERC has no jurisdiction, or has declined to exercise jurisdiction, over such facility. In such cases, the hydroelectric facility must show that its operation allows the river inflow to equal outflow instantaneously and, therefore, does not cause an appreciable change in the river flow, and

(4) "Began operations" means (A) the date an existing facility with existing generation began commercial operation as shown in documentation from FERC, (B) the new date given to an abandoned or destroyed facility that comes back into operation as shown in its documentation from FERC or as determined by the Department, (C) the

date upon which a facility changes operation from store and release to run-of-the-river as shown in documentation from FERC; or (D) the new date that incremental generation is in operation at an existing facility as shown in its documentation from FERC.

See Docket No. 04-02-07, DPUC Declaratory Ruling Concerning "Run-of-the-River Hydropower" as That Term is Used in the Definitions of Class I and Class II Renewable Energy Source in C.G.S. §16-1(a)(26) &(27)

As provided in the application, Cabot 1-4 contains four hydroelectric facilities located in Holyoke, MA. Cabot 1, 2, 3 and 4 are currently owned by HG&E.

According to HG&E, there are two turbine generators at Cabot 1 with a total nameplate capacity of 1 056 MW. HG&E Letter, p. 2, FERC Order Issuing License (Minor Project) dated February 28, 1989 (FERC Order 1), p. 2. FERC issued a license to Cabot 1. FERC Order 1. Within the license, FERC identified that the project does not include dams or other impounding structures, and that hydraulic head is provided by the elevation difference between two canal levels that are part of FERC Project No. 2004-073. Id., inter alia. In the FERC Order Issuing New License and Denying Competing License Application dated August 20, 1999 (Comprehensive FERC Order) which dictates the operations of the Holyoke Dam and the three canal systems (Canal System) below the dam, FERC ordered the Holyoke Water Power Company (previous owner) to operate the project in a run-of-river mode. Comprehensive FERC Order, p. 55. Cabot 1 began operations prior to July 1, 2003. Application, p. 2.

Within the FERC Order Issuing License (Minor Project) dated September 28, 1988 (FERC Order 2), Cabot 2 was identified as having one turbine generator rated at .800 MW located within the Canal System with the same run-of-river operational characteristics as Cabot 1 aforementioned. FERC Order 2, p. 1 inter alia. Cabot 2 began operations prior to July 1, 2003. Application, p. 2.

Within the FERC Order Issuing License (Minor Project) dated September 28, 1988 (FERC Order 3), Cabot 3 was identified as having one turbine generator rated at 450 MW located within the Canal System with the same run-of-river operational characteristics as Cabot 1 aforementioned. FERC Order 3, p. 1 inter alia. Cabot 3 began operations prior to July 1, 2003. Application, p. 2.

Within the FERC Order Issuing License (Minor Project) dated March 19, 1987 (FERC Order 4), Cabot 4 was identified as having two turbine generators rated at .760 MW¹ located within the Canal System with the same run-of-river operational characteristics as Cabot 1 aforementioned. FERC Order 4, p. 1 inter alia. Cabot 4 began operations prior to July 1, 2003. Application, p. 2.

Based on the foregoing, the Department determines that Cabot 1, 2, 3 and 4 qualify as a Class II renewable energy facilities.

¹ Although the HG&E Letter identified the project as having a rated capacity of .750 MW, the Department finds that this nominal discrepancy has no effect on the Department's determination related to Cabot

III. FINDINGS OF FACT

- 1 Cabot 1, 2, 3 and 4 are four separate hydroelectric facilities located in the canal system below the Holyoke Dam in Holyoke, MA.
- 2 Cabot 1, 2, 3 and 4 are currently owned by the Holyoke Gas & Electric Department
- 3 In FERC Orders 1, 2, 3 and 4, the FERC issued licenses to Cabot 1, 2, 3 and 4.
- 4 Within each license, FERC indicated that Cabot 1, 2, 3 and 4 each operate in a run-of-river mode
- 5 Cabot 1, 2, 3 and 4 has a nameplate capacities of 1.076, .800 MW, .450 MW and .760 MW, respectively.
- 6 Cabot 1, 2, 3 and 4 began operations prior to July 1, 2003.

IV. CONCLUSION

Based on the evidence submitted, the Department finds that Cabot 1, 2, 3 and 4 qualify as Class II renewable generation sources pursuant to Conn. Gen. Stat. § 16-1(a)(27).

The Department assigns each renewable generation source a unique RPS registration number. Cabot 1, 2, 3 and 4's Connecticut RPS registration numbers are: CT00102-04, CT00102-04(B), CT00102-04(C), and CT00102-04(D), respectively

The Department's determination in this docket is based on the information submitted by HG&E. The Department may reverse its ruling or revoke the Applicant's registration if any material information provided by the Applicant proves to be false or misleading. The Department reminds HG&E that it is obligated to notify the Department within 10 days of any changes to any of the information it has provided to the Department.

DOCKET NO. 04-01- APPLICATION OF HOLYOKE GAS & ELECTRIC
31RE01 DEPARTMENT FOR QUALIFICATION OF CABOT 1-4 AS
A CLASS II RENEWABLE ENERGY SOURCE -
REOPENER

This Decision is adopted by the following Commissioners:

Anne C. George

Donald W. Downes

John W. Betkoski, III

CERTIFICATE OF SERVICE

The foregoing is a true and correct copy of the Decision issued by the Department of Public Utility Control, State of Connecticut, and was forwarded by Certified Mail to all parties of record in this proceeding on the date indicated

Louise E. Rickard
Acting Executive Secretary
Department of Public Utility Control

Date



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC UTILITY CONTROL
TEN FRANKLIN SQUARE
NEW BRITAIN, CT 06051

DOCKET NO. 04-01-35RE01 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF VALLEY
HYDRO AS A CLASS II RENEWABLE ENERGY
SOURCE - REOPENER

December 14, 2005
By the following Commissioners:

Anne C. George
Donald W. Downes
John W. Betkoski, III

DECISION

I. INTRODUCTION

A. SUMMARY

In this Decision, the Department of Public Utility Control (Department) determines that the Holyoke Station No. 5/Valley Hydro (Valley) generating facility qualifies as a Class II renewable energy source as a run-of-the-river hydroelectric facility and assigns it Connecticut Renewable Portfolio Standard (RPS) Registration Number CT00100-06.

B. BACKGROUND OF THE PROCEEDING

By application dated January 26, 2004, the Holyoke Gas & Electric Department (HG&E) requested that the Department determine that the Valley generation facility qualifies as a Class II renewable energy source. Valley is a run-of-the-river hydroelectric facility located in Holyoke, MA that began commercial operation on November 1, 1994 with a nameplate capacity of .55 MW. Application, pp. 1 and 2.

See Docket No. 04-02-07, DPUC Declaratory Ruling Concerning "Run-of-the-River Hydropower" as That Term is Used in the Definitions of Class I and Class II Renewable Energy Source in C.G.S. §16-1(a)(26) &(27).

As provided in the application, Valley is a hydroelectric facility located at 4 Valley Mills Road, Holyoke, MA. Valley is currently owned by HG&E. Application, p. 1. According to HG&E, there is one turbine generator at this facility, with a total nameplate capacity of .55 MW. Application, p. 2; FERC Order Issuing License (Minor Project) issued June 29, 1990, p. 3. In its Safety and Design Assessment Station No. 5 Hydroelectric Project issued June 12, 1990 (FERC Assessment), the FERC identified that the Valley project would not include a dam or other water-impounding devices, and that the project would be operated remotely in a run-of-river mode. FERC Assessment, pp 1 and 2. Valley began operations November 1, 1994. Application, p. 2.

Based on the foregoing, the Department determines that Valley qualifies as a Class II renewable energy facility.

III. FINDINGS OF FACT

1. Valley is a hydroelectric facility located in Holyoke, MA.
2. Valley is currently owned by the Holyoke Gas & Electric Department.
3. FERC issued a license to Valley on June 29, 1990.
4. In its Safety and Design Assessment Station No. 5 Hydroelectric Project issued June 12, 1990 (FERC Assessment), FERC identified that the Valley project would be operated remotely in a run-of-river mode.
5. Valley has a nameplate capacity of .55 MW.
6. Valley began operations on November 1, 1994.

IV. CONCLUSION

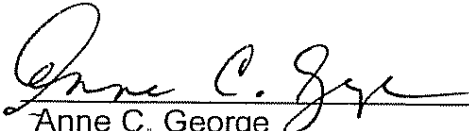
Based on the evidence submitted, the Department finds that Valley qualifies as a Class II renewable generation source pursuant to Conn. Gen. Stat. § 16-1(a)(27).

The Department assigns each renewable generation source a unique RPS registration number. Valley's Connecticut RPS registration number is CT00100-06.


The Department's determination in this docket is based on the information submitted by HG&E. The Department may reverse its ruling or revoke the Applicant's registration if any material information provided by the Applicant proves to be false or misleading. The Department reminds HG&E that it is obligated to notify the Department within 10 days of any changes to any of the information it has provided to the Department.

DOCKET NO. 04-01-35RE01 APPLICATION OF HOLYOKE GAS & ELECTRIC
DEPARTMENT FOR QUALIFICATION OF VALLEY
HYDRO AS A CLASS II RENEWABLE ENERGY
SOURCE - REOPENER

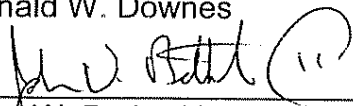
This Decision is adopted by the following Commissioners:



Anne C. George




Donald W. Downes



John W. Betkoski, III

CERTIFICATE OF SERVICE

The foregoing is a true and correct copy of the Decision issued by the Department of Public Utility Control, State of Connecticut, and was forwarded by Certified Mail to all parties of record in this proceeding on the date indicated.



Louise E. Rickard
Acting Executive Secretary
Department of Public Utility Control

DEC 14 2005

Date

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

IN RE: APPLICATION FOR STANDARD CERTIFICATION DOCKET NO. 4126
AS ELIGIBLE RENEWABLE ENERGY RESOURCE
FILED BY HOLYOKE GAS AND ELECTRIC DEPARTMENT – BEEBE
HOLBROOK, EXISTING GENERATION

ORDER

WHEREAS, Effective January 1, 2006, the Rhode Island Public Utilities Commission ("Commission") adopted Rules and Regulations Governing the Implementation of a Renewable Energy Standard (RES Regulations) including requirements for applicants seeking certification as an Eligible Renewable Energy Resource under the RES Regulations¹ pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, On November 30, 2009, Holyoke Gas and Electric Department ("Company", Authorized Representative: James M. Lavelle, Manager, Holyoke Gas & Electric Department, 99 Suffolk St. Holyoke, MA 01040 Phone: (413) 536-9311, Fax: (413) 536-9315, Email:jlavelle@hged.com) filed with the Commission an application seeking certification for its Beebe Holbrook Generation Unit, a 0.516 MW Small Hydro energy Generation Unit located in Holyoke, MA, as an eligible Existing Renewable Energy Resource under the State of Rhode Island RES Regulations; and

WHEREAS, Pursuant to Section 6.0 and other relevant Sections of the RES Regulations, a thirty (30) day period for public comment was provided during which time, no such comments were received, and

¹ State of Rhode Island and Providence Plantations Public Utilities Commission Rules and Regulations Governing the Implementation of a Renewable Energy Standard – Date of Public Notice: September 23, 2005, Date of Public Hearing: October 12, 2005, Effective Date: January 1, 2006.

WHEREAS, After examination, the Commission is of the opinion that the application, is proper, reasonable and in compliance with the RES Regulations, and hereby grants the Company certification as an eligible renewable energy resource pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, The Commission's determination in this docket is based on the information submitted by the Company, and the Commission may reverse its ruling or revoke the Applicant's certification if any material information provided by the Applicant proves to be false or misleading.

Accordingly, it is

(19908) ORDERED:

1) That the Beebe Holbrook Generation Unit, meets the requirements for eligibility as a Existing, Small Hydro Renewable Energy Resource with its 0.516 MW, Grid-Connected Generation Unit having a Commercial Operation Date of January 1, 1948 and located within the NEPOOL Control Area in Holyoke, MA.

2) That the Generation Unit's NEPOOL-GIS Identification Number is MSS812.

3) That the Company's Generation Unit as identified above is hereby assigned unique certification number RI-4126-E10.

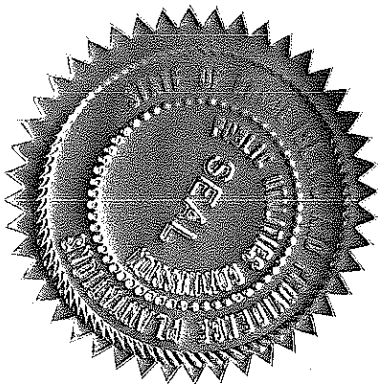
4) That, although the Commission will rely upon the NEPOOL GIS for verification of production of energy from the Company's Generation Unit certified as eligible in this Order, the Company will provide information and access as necessary to the Commission, or persons acting at its behest, to conduct audits or site visits to assist in

verification of continued eligibility for and compliance with RI RES Certification at any time at the Commission's discretion.

5) That the Company shall notify the Commission in the event of a change in the facility's eligibility status.

EFFECTIVE AT WARWICK, RHODE ISLAND ON FEBRUARY 10, 2010
PURSUANT TO AN OPEN MEETING DECISION. WRITTEN ORDER ISSUED
FEBRUARY 11, 2010.

PUBLIC UTILITIES COMMISSION




Elia Germani, Chairman


Mary E. Bray, Commissioner


Paul J. Roberti, Commissioner

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

IN RE: APPLICATION FOR STANDARD CERTIFICATION DOCKET NO. 4124
AS ELIGIBLE RENEWABLE ENERGY RESOURCE
FILED BY HOLYOKE GAS AND ELECTRIC DEPARTMENT – BOATLOCK,
EXISTING GENERATION

ORDER

WHEREAS, Effective January 1, 2006, the Rhode Island Public Utilities Commission ("Commission") adopted Rules and Regulations Governing the Implementation of a Renewable Energy Standard (RES Regulations) including requirements for applicants seeking certification as an Eligible Renewable Energy Resource under the RES Regulations¹ pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, On November 2, 2009, Holyoke Gas and Electric Department ("Company", Authorized Representative: James M. Lavelle, Manager, Holyoke Gas & Electric Department, 99 Suffolk St. Holyoke, MA 01040 Phone: (413) 536-9311, Fax: (413) 536-9315, Email:jlavelle@hged.com) filed with the Commission an application seeking certification for its Boatlock Generation Unit, a 2.90 MW Small Hydro energy Generation Unit located in Holyoke, MA, as an eligible Existing Renewable Energy Resource under the State of Rhode Island RES Regulations; and

WHEREAS, Pursuant to Section 6.0 and other relevant Sections of the RES Regulations, a thirty (30) day period for public comment was provided during which time, no such comments were received, and

¹ State of Rhode Island and Providence Plantations Public Utilities Commission Rules and Regulations Governing the Implementation of a Renewable Energy Standard – Date of Public Notice: September 23, 2005, Date of Public Hearing: October 12, 2005, Effective Date: January 1, 2006.

WHEREAS, After examination, the Commission is of the opinion that the application, is proper, reasonable and in compliance with the RES Regulations, and hereby grants the Company certification as an eligible renewable energy resource pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, The Commission's determination in this docket is based on the information submitted by the Company, and the Commission may reverse its ruling or revoke the Applicant's certification if any material information provided by the Applicant proves to be false or misleading.

Accordingly, it is

(19906) ORDERED:

1) That the Boatlock Generation Unit, meets the requirements for eligibility as a Existing, Small Hydro Renewable Energy Resource with its 2.90 MW, Grid-Connected Generation Unit having a Commercial Operation Date of January 1, 1924 and located within the NEPOOL Control Area in Holyoke, MA.

2) That the Generation Unit's NEPOOL-GIS Identification Number is MSS859.

3) That the Company's Generation Unit as identified above is hereby assigned unique certification number RI-4124-E10.

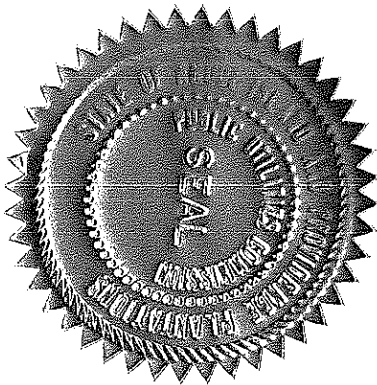
4) That, although the Commission will rely upon the NEPOOL GIS for verification of production of energy from the Company's Generation Unit certified as eligible in this Order, the Company will provide information and access as necessary to the Commission, or persons acting at its behest, to conduct audits or site visits to assist in

verification of continued eligibility for and compliance with RI RES Certification at any time at the Commission's discretion.

5) That the Company shall notify the Commission in the event of a change in the facility's eligibility status.

EFFECTIVE AT WARWICK, RHODE ISLAND ON FEBRUARY 10, 2010
PURSUANT TO AN OPEN MEETING DECISION. WRITTEN ORDER ISSUED
FEBRUARY 11, 2010.

PUBLIC UTILITIES COMMISSION



Elia Germani, Chairman

Mary E. Bray, Commissioner

Paul J. Roberti, Commissioner

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

IN RE: APPLICATION FOR STANDARD CERTIFICATION DOCKET NO. 4120
AS ELIGIBLE RENEWABLE ENERGY RESOURCE
FILED BY HOLYOKE GAS AND ELECTRIC DEPARTMENT – CHEMICAL,
EXISTING GENERATION

ORDER

WHEREAS, Effective January 1, 2006, the Rhode Island Public Utilities Commission ("Commission") adopted Rules and Regulations Governing the Implementation of a Renewable Energy Standard (RES Regulations) including requirements for applicants seeking certification as an Eligible Renewable Energy Resource under the RES Regulations¹ pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, On November 2, 2009, Holyoke Gas and Electric Department ("Company", Authorized Representative: James M. Lavelle, Manager, Holyoke Gas & Electric Department, 99 Suffolk St. Holyoke, MA 01040 Phone: (413) 536-9311, Fax: (413) 536-9315, Email:jlavelle@hged.com) filed with the Commission an application seeking certification for its Chemical Generation Unit, a 1.60 MW Small Hydro energy Generation Unit located in Holyoke, MA, as an eligible Existing Renewable Energy Resource under the State of Rhode Island RES Regulations; and

WHEREAS, Pursuant to Section 6.0 and other relevant Sections of the RES Regulations, a thirty (30) day period for public comment was provided during which time, no such comments were received, and

¹ State of Rhode Island and Providence Plantations Public Utilities Commission Rules and Regulations Governing the Implementation of a Renewable Energy Standard – Date of Public Notice: September 23, 2005, Date of Public Hearing: October 12, 2005, Effective Date: January 1, 2006.

WHEREAS, After examination, the Commission is of the opinion that the application, is proper, reasonable and in compliance with the RES Regulations, and hereby grants the Company certification as an eligible renewable energy resource pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, The Commission's determination in this docket is based on the information submitted by the Company, and the Commission may reverse its ruling or revoke the Applicant's certification if any material information provided by the Applicant proves to be false or misleading.

Accordingly, it is

(19902) ORDERED:

1) That the Chemical Generation Unit, meets the requirements for eligibility as a Existing, Small Hydro Renewable Energy Resource with its 1.60 MW, Grid-Connected Generation Unit having a Commercial Operation Date of January 1, 1935 and located within the NEPOOL Control Area in Holyoke, MA.

2) That the Generation Unit's NEPOOL-GIS Identification Number is MSS862.

3) That the Company's Generation Unit as identified above is hereby assigned unique certification number RI-4120-E10.

4) That, although the Commission will rely upon the NEPOOL GIS for verification of production of energy from the Company's Generation Unit certified as eligible in this Order, the Company will provide information and access as necessary to the Commission, or persons acting at its behest, to conduct audits or site visits to assist in

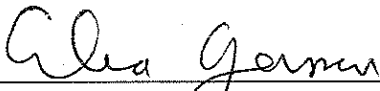
verification of continued eligibility for and compliance with RI RES Certification at any time at the Commission's discretion.

5) That the Company shall notify the Commission in the event of a change in the facility's eligibility status.

EFFECTIVE AT WARWICK, RHODE ISLAND ON FEBRUARY 10, 2010
PURSUANT TO AN OPEN MEETING DECISION. WRITTEN ORDER ISSUED
FEBRUARY 11, 2010.

PUBLIC UTILITIES COMMISSION




Elia Germani, Chairman


Mary E. Bray, Commissioner


Paul J. Roberti, Commissioner

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

IN RE: APPLICATION FOR STANDARD CERTIFICATION DOCKET NO. 4125
AS ELIGIBLE RENEWABLE ENERGY RESOURCE
FILED BY HOLYOKE GAS AND ELECTRIC DEPARTMENT –
RIVERSIDE 4-7, EXISTING GENERATION

ORDER

WHEREAS, Effective January 1, 2006, the Rhode Island Public Utilities Commission ("Commission") adopted Rules and Regulations Governing the Implementation of a Renewable Energy Standard (RES Regulations) including requirements for applicants seeking certification as an Eligible Renewable Energy Resource under the RES Regulations¹ pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, On November 2, 2009, Holyoke Gas and Electric Department ("Company", Authorized Representative: James M. Lavelle, Manager, Holyoke Gas & Electric Department, 99 Suffolk St. Holyoke, MA 01040 Phone: (413) 536-9311, Fax: (413) 536-9315, Email:jlavelle@hged.com) filed with the Commission an application seeking certification for its Riverside 4-7 Generation Unit, a 3.04 MW Small Hydro energy Generation Unit located in Holyoke, MA, as an eligible Existing Renewable Energy Resource under the State of Rhode Island RES Regulations; and

WHEREAS, Pursuant to Section 6.0 and other relevant Sections of the RES Regulations, a thirty (30) day period for public comment was provided during which time, no such comments were received, and

¹ State of Rhode Island and Providence Plantations Public Utilities Commission Rules and Regulations Governing the Implementation of a Renewable Energy Standard – Date of Public Notice: September 23, 2005, Date of Public Hearing: October 12, 2005, Effective Date: January 1, 2006.

WHEREAS, After examination, the Commission is of the opinion that the application, is proper, reasonable and in compliance with the RES Regulations, and hereby grants the Company certification as an eligible renewable energy resource pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, The Commission's determination in this docket is based on the information submitted by the Company, and the Commission may reverse its ruling or revoke the Applicant's certification if any material information provided by the Applicant proves to be false or misleading.

Accordingly, it is

(19907) ORDERED:

1) That the Riverside 4-7 Generation Unit, meets the requirements for eligibility as a Existing, Small Hydro Renewable Energy Resource with its 3.04 MW, Grid-Connected Generation Unit having a Commercial Operation Date of January 1, 1921 and located within the NEPOOL Control Area in Holyoke, MA.

2) That the Generation Unit's NEPOOL-GIS Identification Number is MSS1034.

3) That the Company's Generation Unit as identified above is hereby assigned unique certification number RI-4125-E10.

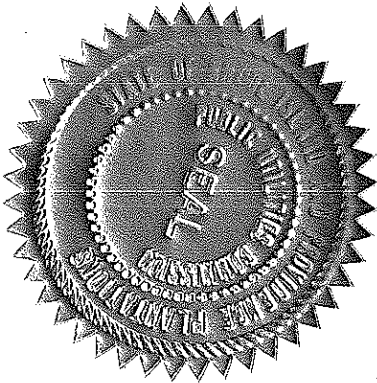
4) That, although the Commission will rely upon the NEPOOL GIS for verification of production of energy from the Company's Generation Unit certified as eligible in this Order, the Company will provide information and access as necessary to the Commission, or persons acting at its behest, to conduct audits or site visits to assist in

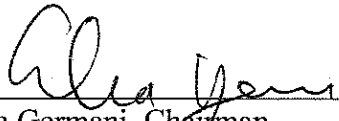
verification of continued eligibility for and compliance with RI RES Certification at any time at the Commission's discretion.

5) That the Company shall notify the Commission in the event of a change in the facility's eligibility status.

EFFECTIVE AT WARWICK, RHODE ISLAND ON FEBRUARY 10, 2010
PURSUANT TO AN OPEN MEETING DECISION. WRITTEN ORDER ISSUED
FEBRUARY 11, 2010.

PUBLIC UTILITIES COMMISSION




Elia Germani, Chairman


Mary E. Bray, Commissioner


Paul J. Roberti, Commissioner

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

IN RE: APPLICATION FOR STANDARD CERTIFICATION DOCKET NO. 4121
AS ELIGIBLE RENEWABLE ENERGY RESOURCE
FILED BY HOLYOKE GAS AND ELECTRIC DEPARTMENT –
RIVERSIDE 8, EXISTING GENERATION

ORDER

WHEREAS, Effective January 1, 2006, the Rhode Island Public Utilities Commission ("Commission") adopted Rules and Regulations Governing the Implementation of a Renewable Energy Standard (RES Regulations) including requirements for applicants seeking certification as an Eligible Renewable Energy Resource under the RES Regulations¹ pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, On November 2, 2009, Holyoke Gas and Electric Department ("Company", Authorized Representative: James M. Lavelle, Manager, Holyoke Gas & Electric Department, 99 Suffolk St. Holyoke, MA 01040 Phone: (413) 536-9311, Fax: (413) 536-9315, Email:jlavelle@hged.com) filed with the Commission an application seeking certification for its Riverside 8 Generation Unit, a 4.00 MW Small Hydro energy Generation Unit located in Holyoke, MA, as an eligible Existing Renewable Energy Resource under the State of Rhode Island RES Regulations; and

WHEREAS, Pursuant to Section 6.0 and other relevant Sections of the RES Regulations, a thirty (30) day period for public comment was provided during which time, no such comments were received, and

¹ State of Rhode Island and Providence Plantations Public Utilities Commission Rules and Regulations Governing the Implementation of a Renewable Energy Standard – Date of Public Notice: September 23, 2005, Date of Public Hearing: October 12, 2005, Effective Date: January 1, 2006.

WHEREAS, After examination, the Commission is of the opinion that the application, is proper, reasonable and in compliance with the RES Regulations, and hereby grants the Company certification as an eligible renewable energy resource pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, The Commission's determination in this docket is based on the information submitted by the Company, and the Commission may reverse its ruling or revoke the Applicant's certification if any material information provided by the Applicant proves to be false or misleading.

Accordingly, it is

(19903) ORDERED:

1) That the Riverside 8 Generation Unit, meets the requirements for eligibility as a Existing, Small Hydro Renewable Energy Resource with its 4.00 MW, Grid-Connected Generation Unit having a Commercial Operation Date of January 1, 1931 and located within the NEPOOL Control Area in Holyoke, MA.

2) That the Generation Unit's NEPOOL-GIS Identification Number is MSS1035.

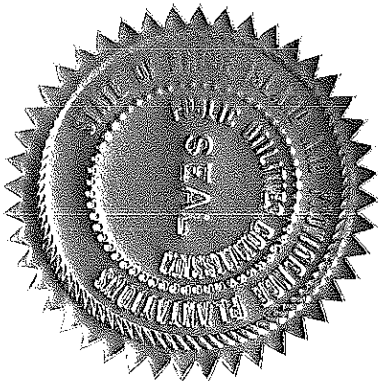
3) That the Company's Generation Unit as identified above is hereby assigned unique certification number RI-4121-E10.

4) That, although the Commission will rely upon the NEPOOL GIS for verification of production of energy from the Company's Generation Unit certified as eligible in this Order, the Company will provide information and access as necessary to the Commission, or persons acting at its behest, to conduct audits or site visits to assist in

verification of continued eligibility for and compliance with RI RES Certification at any time at the Commission's discretion.

5) That the Company shall notify the Commission in the event of a change in the facility's eligibility status.

EFFECTIVE AT WARWICK, RHODE ISLAND ON FEBRUARY 10, 2010
PURSUANT TO AN OPEN MEETING DECISION. WRITTEN ORDER ISSUED
FEBRUARY 11, 2010.



PUBLIC UTILITIES COMMISSION


Elia Germani, Chairman


Mary E. Bray, Commissioner


Paul J. Roberti, Commissioner

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

IN RE: APPLICATION FOR STANDARD CERTIFICATION DOCKET NO. 4123
AS ELIGIBLE RENEWABLE ENERGY RESOURCE
FILED BY HOLYOKE GAS AND ELECTRIC DEPARTMENT – SKINNER,
EXISTING GENERATION

ORDER

WHEREAS, Effective January 1, 2006, the Rhode Island Public Utilities Commission ("Commission") adopted Rules and Regulations Governing the Implementation of a Renewable Energy Standard (RES Regulations) including requirements for applicants seeking certification as an Eligible Renewable Energy Resource under the RES Regulations¹ pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, On November 2, 2009, Holyoke Gas and Electric Department ("Company", Authorized Representative: James M. Lavelle, Manager, Holyoke Gas & Electric Department, 99 Suffolk St. Holyoke, MA 01040 Phone: (413) 536-9311, Fax: (413) 536-9315, Email:jlavelle@hged.com) filed with the Commission an application seeking certification for its Skinner Generation Unit, a 0.30 MW Small Hydro energy Generation Unit located in Holyoke, MA, as an eligible Existing Renewable Energy Resource under the State of Rhode Island RES Regulations; and

WHEREAS, Pursuant to Section 6.0 and other relevant Sections of the RES Regulations, a thirty (30) day period for public comment was provided during which time, no such comments were received, and

¹ State of Rhode Island and Providence Plantations Public Utilities Commission Rules and Regulations Governing the Implementation of a Renewable Energy Standard – Date of Public Notice: September 23, 2005, Date of Public Hearing: October 12, 2005, Effective Date: January 1, 2006.

WHEREAS, After examination, the Commission is of the opinion that the application, is proper, reasonable and in compliance with the RES Regulations, and hereby grants the Company certification as an eligible renewable energy resource pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, The Commission's determination in this docket is based on the information submitted by the Company, and the Commission may reverse its ruling or revoke the Applicant's certification if any material information provided by the Applicant proves to be false or misleading.

Accordingly, it is

(19905) ORDERED:

1) That the Skinner Generation Unit, meets the requirements for eligibility as a Existing, Small Hydro Renewable Energy Resource with its 0.30 MW, Grid-Connected Generation Unit having a Commercial Operation Date of January 1, 1924 and located within the NEPOOL Control Area in Holyoke, MA.

2) That the Generation Unit's NEPOOL-GIS Identification Number is MSS878.

3) That the Company's Generation Unit as identified above is hereby assigned unique certification number RI-4123-E10.

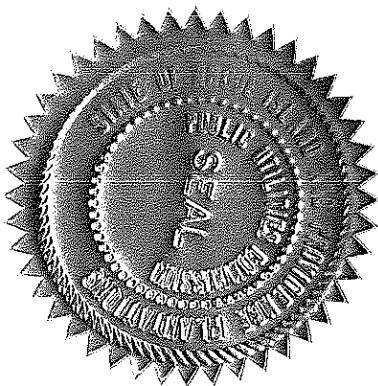
4) That, although the Commission will rely upon the NEPOOL GIS for verification of production of energy from the Company's Generation Unit certified as eligible in this Order, the Company will provide information and access as necessary to the Commission, or persons acting at its behest, to conduct audits or site visits to assist in

verification of continued eligibility for and compliance with RI RES Certification at any time at the Commission's discretion.

5) That the Company shall notify the Commission in the event of a change in the facility's eligibility status.

EFFECTIVE AT WARWICK, RHODE ISLAND ON FEBRUARY 10, 2010
PURSUANT TO AN OPEN MEETING DECISION. WRITTEN ORDER ISSUED
FEBRUARY 11, 2010.

PUBLIC UTILITIES COMMISSION



Elia Germani

Elia Germani, Chairman

Mary E. Bray

Mary E. Bray, Commissioner

Paul J. Roberti

Paul J. Roberti, Commissioner

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

IN RE: APPLICATION FOR STANDARD CERTIFICATION DOCKET NO. 4127
AS ELIGIBLE RENEWABLE ENERGY RESOURCE
FILED BY HOLYOKE GAS AND ELECTRIC DEPARTMENT – HARRIS
ENERGY, EXISTING GENERATION

ORDER

WHEREAS, Effective January 1, 2006, the Rhode Island Public Utilities Commission ("Commission") adopted Rules and Regulations Governing the Implementation of a Renewable Energy Standard (RES Regulations) including requirements for applicants seeking certification as an Eligible Renewable Energy Resource under the RES Regulations¹ pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, On November 2, 2009, Holyoke Gas and Electric Department ("Company", Authorized Representative: James M. Lavelle, Manager, Holyoke Gas & Electric Department, 99 Suffolk St. Holyoke, MA 01040 Phone: (413) 536-9311, Fax: (413) 536-9315, Email:jlavelle@hged.com) filed with the Commission an application seeking certification for its Harris Energy Generation Unit, a 2.421MW Small Hydro energy Generation Unit, comprised of (6) six small run-of-river projects, including: Albion Mill A (0.281 MW), Albion Mill B (0.395 MW), Gill Mill A (0.0450 MW), Gill Mill D (0.330 MW), Mt. Tom Mill (0.473 MW), and Nonotuck Mill (0.492 MW), respectively, located in Holyoke, MA, as an eligible Existing Renewable Energy Resource under the State of Rhode Island RES Regulations; and

¹ State of Rhode Island and Providence Plantations Public Utilities Commission Rules and Regulations Governing the Implementation of a Renewable Energy Standard – Date of Public Notice: September 23, 2005, Date of Public Hearing: October 12, 2005, Effective Date: January 1, 2006.

WHEREAS, Pursuant to Section 6.0 and other relevant Sections of the RES Regulations, a thirty (30) day period for public comment was provided during which time, no such comments were received, and

WHEREAS, On January 21, 2010, supplemental and clarifying information was provided to Commission Staff and their application review consultant in response to the application review consultant's January 20, 2010 request for said information, and

WHEREAS, Said supplemental and clarifying information included: HG&E's request to retract their statement (included in the original application) for the RI PUC to issue separate RI RPS Registration Numbers for each of the above hydro projects and instead request that they receive one registration number for the aggregate of Harris Energy, and

WHEREAS, After examination, the Commission is of the opinion that the application, including said supplemental information is proper, reasonable and in compliance with the RES Regulations, and hereby grants the Company certification as an eligible renewable energy resource pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, The Commission's determination in this docket is based on the information submitted by the Company, and the Commission may reverse its ruling or revoke the Applicant's certification if any material information provided by the Applicant proves to be false or misleading.

Accordingly, it is

(19909) ORDERED:

1) That the Harris Energy Generation Unit, meets the requirements for eligibility as a Existing, Small Hydro Renewable Energy Resource with its aggregated 2.421 MW, Grid-Connected Generation Unit having a Commercial Operation Date of January 1, 1919 and located within the NEPOOL Control Area in Holyoke, MA.

2) That the Generation Unit's NEPOOL-GIS Identification Number is MSS12168.

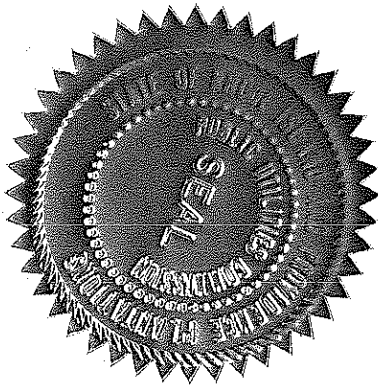
3) That the Company's Generation Unit as identified above is hereby assigned unique certification number RI-4127-E10.

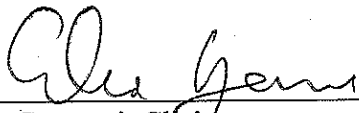
4) That, although the Commission will rely upon the NEPOOL GIS for verification of production of energy from the Company's Generation Unit certified as eligible in this Order, the Company will provide information and access as necessary to the Commission, or persons acting at its behest, to conduct audits or site visits to assist in verification of continued eligibility for and compliance with RI RES Certification at any time at the Commission's discretion.

5) That the Company shall notify the Commission in the event of a change in the facility's eligibility status.


EFFECTIVE AT WARWICK, RHODE ISLAND ON FEBRUARY 10, 2010
PURSUANT TO AN OPEN MEETING DECISION. WRITTEN ORDER ISSUED
FEBRUARY 11, 2010.

PUBLIC UTILITIES COMMISSION




Elia Germani, Chairman


Mary E. Bray, Commissioner


Paul J. Roberti, Commissioner

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

IN RE: APPLICATION FOR STANDARD CERTIFICATION DOCKET NO. 4119
AS ELIGIBLE RENEWABLE ENERGY RESOURCE
FILED BY HOLYOKE GAS AND ELECTRIC DEPARTMENT – HG&E
HYDRO/CABOT 1-4, EXISTING GENERATION

ORDER

WHEREAS, Effective January 1, 2006, the Rhode Island Public Utilities Commission ("Commission") adopted Rules and Regulations Governing the Implementation of a Renewable Energy Standard (RES Regulations) including requirements for applicants seeking certification as an Eligible Renewable Energy Resource under the RES Regulations¹ pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, On November 2, 2009, Holyoke Gas and Electric Department ("Company", Authorized Representative: James M. Lavelle, Manager, Holyoke Gas & Electric Department, 99 Suffolk St. Holyoke, MA 01040 Phone: (413) 536-9311, Fax: (413) 536-9315, Email:jlavelle@hged.com) filed with the Commission an application seeking certification for its HG&E Hydro/Cabot 1-4 Generation Unit, a 3.056 MW Small Hydro energy Generation Unit, comprised of (4) four small run-of-river projects, including: Holyoke No. 1 (1.056 MW), Holyoke No. 2 (0.800 MW), Holyoke No. 3 (0.450 MW), and Holyoke No. 4 (0.750 MW), respectively, located in Holyoke, MA, as an eligible Existing Renewable Energy Resource under the State of Rhode Island RES Regulations; and

¹ State of Rhode Island and Providence Plantations Public Utilities Commission Rules and Regulations Governing the Implementation of a Renewable Energy Standard – Date of Public Notice: September 23, 2005, Date of Public Hearing: October 12, 2005, Effective Date: January 1, 2006.

WHEREAS, Pursuant to Section 6.0 and other relevant Sections of the RES Regulations, a thirty (30) day period for public comment was provided during which time, no such comments were received, and

WHEREAS, On January 21, 2010, supplemental and clarifying information was provided to Commission Staff and their application review consultant in response to the application review consultant's January 20, 2010 request for said information, and

WHEREAS, Said supplemental and clarifying information included: HG&E's request to retract their statement (included in the original application) for the RI PUC to issue separate RI RPS Registration Numbers for each of the above hydro projects and instead request that they receive one registration number for the aggregate of HG&E Hydro/Cabot 1-4, and

WHEREAS, After examination, the Commission is of the opinion that the application, including said supplemental information is proper, reasonable and in compliance with the RES Regulations, and hereby grants the Company certification as an eligible renewable energy resource pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, The Commission's determination in this docket is based on the information submitted by the Company, and the Commission may reverse its ruling or revoke the Applicant's certification if any material information provided by the Applicant proves to be false or misleading.

Accordingly, it is

(19901) ORDERED:

1) That the HG&E Hydro/Cabot 1-4 Generation Unit, meets the requirements for eligibility as a Existing, Small Hydro Renewable Energy Resource with its aggregated

3.056 MW, Grid-Connected Generation Unit having a Commercial Operation Date of January 1, 1923 and located within the NEPOOL Control Area in Holyoke, MA.

2) That the Generation Unit's NEPOOL-GIS Identification Number is MSS957.

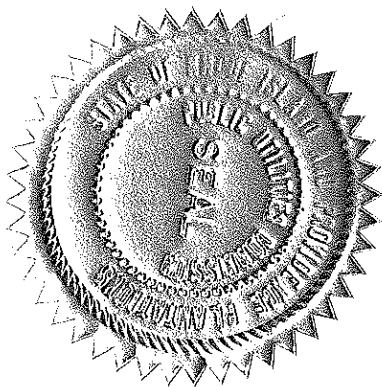
3) That the Company's Generation Unit as identified above is hereby assigned unique certification number RI-4119-E10.

4) That, although the Commission will rely upon the NEPOOL GIS for verification of production of energy from the Company's Generation Unit certified as eligible in this Order, the Company will provide information and access as necessary to the Commission, or persons acting at its behest, to conduct audits or site visits to assist in verification of continued eligibility for and compliance with RI RES Certification at any time at the Commission's discretion.

5) That the Company shall notify the Commission in the event of a change in the facility's eligibility status.

EFFECTIVE AT WARWICK, RHODE ISLAND ON FEBRUARY 10, 2010
PURSUANT TO AN OPEN MEETING DECISION. WRITTEN ORDER ISSUED
FEBRUARY 11, 2010.

PUBLIC UTILITIES COMMISSION



Elia Germani
Elia Germani, Chairman

Mary E. Bray
Mary E. Bray, Commissioner

Paul J. Roberti
Paul J. Roberti, Commissioner

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

IN RE: APPLICATION FOR STANDARD CERTIFICATION DOCKET NO. 4122
AS ELIGIBLE RENEWABLE ENERGY RESOURCE
FILED BY HOLYOKE GAS AND ELECTRIC DEPARTMENT – VALLEY
HYDRO (STATION NO. 5), EXISTING GENERATION

ORDER

WHEREAS, Effective January 1, 2006, the Rhode Island Public Utilities Commission ("Commission") adopted Rules and Regulations Governing the Implementation of a Renewable Energy Standard (RES Regulations) including requirements for applicants seeking certification as an Eligible Renewable Energy Resource under the RES Regulations¹ pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, On November 2, 2009, Holyoke Gas and Electric Department ("Company", Authorized Representative: James M. Lavelle, Manager, Holyoke Gas & Electric Department, 99 Suffolk St. Holyoke, MA 01040 Phone: (413) 536-9311, Fax: (413) 536-9315, Email:jlavelle@hged.com) filed with the Commission an application seeking certification for its Valley Hydro (Station No. 5) Generation Unit, a 0.79 MW Small Hydro energy Generation Unit located in Holyoke, MA, as an eligible Existing Renewable Energy Resource under the State of Rhode Island RES Regulations; and

WHEREAS, Pursuant to Section 6.0 and other relevant Sections of the RES Regulations, a thirty (30) day period for public comment was provided during which time, no such comments were received, and

¹ State of Rhode Island and Providence Plantations Public Utilities Commission Rules and Regulations Governing the Implementation of a Renewable Energy Standard – Date of Public Notice: September 23, 2005, Date of Public Hearing: October 12, 2005, Effective Date: January 1, 2006.

WHEREAS, After examination, the Commission is of the opinion that the application, is proper, reasonable and in compliance with the RES Regulations, and hereby grants the Company certification as an eligible renewable energy resource pursuant to the Renewable Energy Act, Section 39-26-1 et. seq. of the General Laws of Rhode Island; and

WHEREAS, The Commission's determination in this docket is based on the information submitted by the Company, and the Commission may reverse its ruling or revoke the Applicant's certification if any material information provided by the Applicant proves to be false or misleading.

Accordingly, it is

(19904) ORDERED:

1) That the Valley Hydro (Station No. 5) Generation Unit, meets the requirements for eligibility as a Existing, Small Hydro Renewable Energy Resource with its 0.79 MW, Grid-Connected Generation Unit having a Commercial Operation Date of November 1, 1994 and located within the NEPOOL Control Area in Holyoke, MA.

2) That the Generation Unit's NEPOOL-GIS Identification Number is MSS14623.

3) That the Company's Generation Unit as identified above is hereby assigned unique certification number RI-4122-E10.

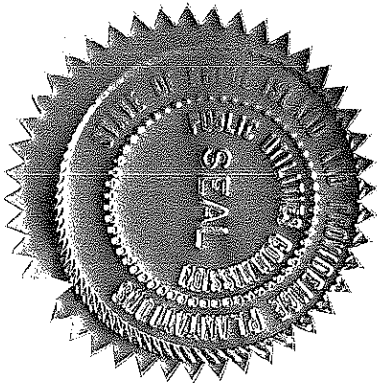
4) That, although the Commission will rely upon the NEPOOL GIS for verification of production of energy from the Company's Generation Unit certified as eligible in this Order, the Company will provide information and access as necessary to the Commission, or persons acting at its behest, to conduct audits or site visits to assist in

verification of continued eligibility for and compliance with RI RES Certification at any time at the Commission's discretion.

5) That the Company shall notify the Commission in the event of a change in the facility's eligibility status.

EFFECTIVE AT WARWICK, RHODE ISLAND ON FEBRUARY 10, 2010
PURSUANT TO AN OPEN MEETING DECISION. WRITTEN ORDER ISSUED
FEBRUARY 11, 2010.

PUBLIC UTILITIES COMMISSION



Elia Germani, Chairman

Mary E. Bray, Commissioner

Paul J. Roberti, Commissioner