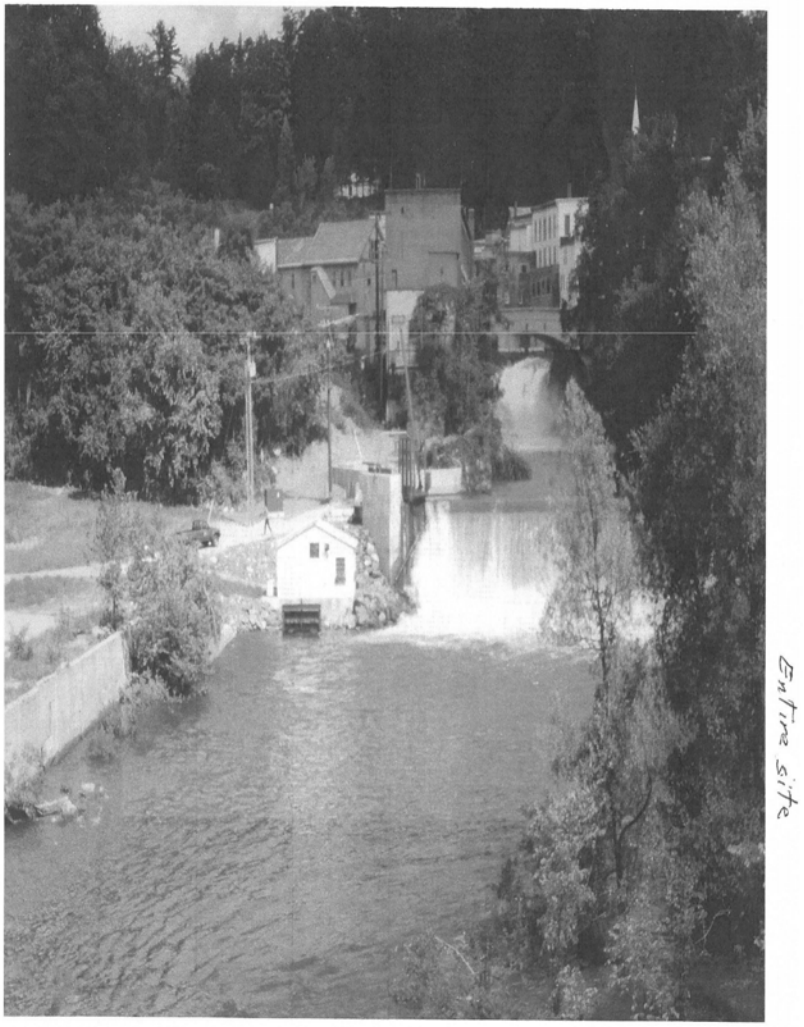
Slack Dam LIHI Recertification Application



Prepared for:

Springfield Hydroelectric Co.

Prepared by
Mathew Rubin

1/16/17

Slack Dam LIHI Recertification Application 1/16/17

Contents

1. Introduction

This is an application to the Low Impact Hydropower Institute (LIHI) for recertification of Slack Dam, presently holder of LIHI Certificate No. 78, effective Feb 28, 2011.
There have been no material changes in the facility design or operation since the most recent LIHI review that was completed on 10/3/2011, included in this application as Appendix A. The facility continues to be operated in run-of-river mode.
There also have been no material changes in the environmental conditions in the project vicinity since that most recent LIHI review. The only material changes that have occurred recently are in the revised LIHI certification criteria described in the 2016 version of LIHI's certification handbook.
The information provided in this recertification application provides an update to support a new LIHI certification.

2. Facility Description

The Winooski 8 hydroelectric project was reconstructed in 1986. The project is the same as was described in the LIHI Certification Report of October, 2011.The project is operated in strict run-of-river mode.

There are no migratory fish in either of the project Zones.

Facility Description Information for Slack Dam (LIHI Certification # 78)

Information Type	*Variable Description*	*Response(and reference to further details)*
Name of the Facility	Facility name (use FERC project name if possible)	Slack Dam
Location	River name (USGS proper name)	Black River
	River basin name	Black River
	Nearest town, county, and state	Springfield, Windsor, VT
	River mile of dam above next major river	4.2 Miles above CT River
	Geographic latitude	43.297566
	Geographic longitude	-72.481284
Facility Owner	Application contact names (IMPORTANT: you must also complete the Facilities Contact Form):	Mathew Rubin
	- Facility owner (individual and company names)	Springfield Hydroelectric Co.
	- Operating affiliate (if different from owner)	
	- Representative in LIHI certification	Mathew Rubin
Regulatory Status	FERC Project Number (e.g., P-xxxxx), issuance and expiration dates	8014-VT Issued Sept, 30, 1985
	FERC license type or special classification (e.g., "qualified conduit")	Exemption
	Water Quality Certificate identifier and issuance date, plus source agency name	401 Water Quality Certificate issued Jan, 1985 Amended Mar, 1986
	Hyperlinks to key electronic records on FERC e-library website (e.g., most recent Commission Orders, WQC, ESA documents, etc.)	DNA
	Date of initial operation (past or future for operational applications)	1986
	Total name-plate capacity (MW)	0.4 MW
	Average annual generation (MWh)	2,000 MWh

Power Plant Characteristics	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	1 Full Kaplan, 1200 MM Qmax: 296 cfs Qmin:30 cfs
	Modes of operation (run-of-river, peaking, pulsing, seasonal storage, etc.)	Strict Run-of-River
	Dates and types of major equipment upgrades	None
	Dates, purpose, and type of any recent operational changes	None
	Plans, authorization, and regulatory activities for any facility upgrades	None
Characteristics of Dam, Diversion, or Conduit	Date of construction	1986
	Dam height	20′
	Spillway elevation and hydraulic capacity	364.5 MSL
	Tailwater elevation	343.6 MSL
	Length and type of all penstocks and water conveyance structures between reservoir and powerhouse	80’ long x 8’ diameter steel penstock
	Dates and types of major, generation-related infrastructure improvements	1986
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power generation
	Water source	Black River
	Water discharge location or facility	Slack Dam Tailrace
Characteristics of Reservoir and Watershed	Gross volume and surface area at full pool	10 acre- Ft Volume 1 acre surface area
	Maximum water surface elevation (ft. MSL)	364.55
	Maximum and minimum volume and water surface elevations for designated power pool, if available	364.55 MSL Operating Set Point
	Upstream dam(s) by name, ownership, FERC number (if applicable), and river mile	Comtu Falls Gravity Renewables, P-7888 Rivermile 4.4
	Downstream dam(s) by name, ownership, FERC number (if applicable), and river mile	Lovejoy Tool, Todd Priestly River mile 4.0
	Operating agreements with upstream or downstream reservoirs that affect water availability, if any, and facility operation	None
	Area inside FERC project boundary, where appropriate	1.06 Acres
	Average annual flow at the dam	355 cfs mean daily flow
	Average monthly flows	Refer to Appendix J

Hydrologic Setting	Location and name of relevant stream gauging stations above and below the facility	Above: USGS #01153000 DA 158 sq. mi Below: none relevant
	Watershed area at the dam	190 sq. mi
Designated Zones of Effect	Number of zones of effect	Two
	Upstream and downstream locations by river miles	Zone 1 4.2 to 0.0 river miles Zone 2 4.2 to 4.36 river miles
	Type of waterbody (river, impoundment, by-passed reach, etc.)	Zone 1 Regulated riverine reach Zone 2 Impoundment
	Delimiting structures	Dam Crest at river mile 4.2
	Designated uses by state water quality agency	Hydropower generation
Additional Contact Information	Names, addresses, phone numbers, and e-mail for local state and federal resource agencies	Refer to Appendix K
	Names, addresses, phone numbers, and e-mail for local non-governmental stakeholders	Refer to Appendix L
Photographs and Maps	Photographs of key features of the facility and each of the designated zones of effect	Refer to Appendices H1, H2, H3 and H4
	Maps, aerial photos, and/or plan view diagrams of facility area and river basin	Refer to Appendices I1 and I2

3. **Matrix of Alternative Standards Templates:**

Facility Name: Slack Dam **Zone of Effect: Zone 1 Regulated Riverine Reach**

Criterion		*Alternative Standards*				
		1	*2*	*3*	*4*	*Plus*
A	Ecological Flow Regimes	X				
B	Water Quality	X				
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection	X				
G	Cultural and Historic Resources Protection	X				
H	Recreational Resources	X				

Facility Name: Slack Dam **Zone of Effect: Zone 2 Impoundment**

Criterion		*Alternative Standards*				
		1	*2*	*3*	*4*	*Plus*
A	Ecological Flow Regimes	X				
B	Water Quality	X				
C	Upstream Fish Passage		X			
D	Downstream Fish Passage		X			
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection	X				
G	Cultural and Historic Resources Protection	X				
H	Recreational Resources	X				

4. Supporting Information

A. Ecological Flow Regimes:

Zone 1

Criterion	*Standard*	*Instructions*
A	1	<u>Not Applicable / De Minimis Effect:</u> • Confirm the location of the powerhouse relative to other dam/ diversion structures to establish that there are no bypassed reaches at the facility. • If Run-of-River operation, provide details on how flows, water levels, and operation are monitored to ensure such an operational mode is maintained • In a conduit project, identify the water source and discharge points for the conduit system within which the hydropower plant is located. • For impoundment zones only, explain how fish and wildlife habitat within the zone is evaluated and managed – NOTE: this is required information, but it will not be used to determine whether the Ecological Flows criterion has been satisfied. All impoundment zones can apply Criterion A-1 to pass this criterion.

Refer to Appendices H1, H2 and H4

- The project is operated in a strict Run-of-River mode. The required 0.5" minimum flow is passed over the dam. The turbine is a full Kaplan, which allows the machine to closely follow variations in flow to maintain the impoundment at 354.55' MSL. Out of tolerance operation results in automatic callout with an alarm to the operator(s). The project operates in compliance with its Water Quality Certification. Refer to Appendices E and F.
- There is no conduit
- There is no impoundment in Zone 1. The Black River is narrow until it passes over the Lovejoy Dam 0.2 miles downstream.

Refer to Appendix I1.

Zone 2

Criterion	*Standard*	*Instructions*
A	1	Not Applicable / De Minimis Effect: • Confirm the location of the powerhouse relative to other dam/ diversion structures to establish that there are no bypassed reaches at the facility. • If Run-of-River operation, provide details on how flows, water levels, and operation are monitored to ensure such an operational mode is maintained • In a conduit project, identify the water source and discharge points for the conduit system within which the hydropower plant is located. • For impoundment zones only, explain how fish and wildlife habitat within the zone is evaluated and managed – NOTE: this is required information, but it will not be used to determine whether the Ecological Flows criterion has been satisfied. All impoundment zones can apply Criterion A-1 to pass this criterion.

Refer to Appendix H1 and H2.

- The project is operated in a strict Run-of-River mode. The required 0.5" minimum flow is passed over the dam. The turbine is a full Kaplan, which allows the machine to closely follow variations in flow to maintain the impoundment at 354.55' MSL. Out of tolerance operation results in automatic callout with an alarm to the operator(s). The project operates in compliance with its Water Quality Certification. Refer to Appendices E and F.
- There is no conduit.
- The impoundment Zone (the head pond) is less than 1 acre and is the tailwater of the Comtu Falls hydroelectric project 0.16 miles (approximately 800') upstream. There is no management of fish and wildlife habitat in the impoundment zone.

B. Water Quality:

Zone 1

Criterion	*Standard*	*Instructions*
B	1	Not Applicable/De Minimis Effect: • The facility does not alter the physical, chemical, or biotic water characteristics necessary to support fish and wildlife resources or human water uses (e.g., water supply or recreation)

Refer to Appendix A, Appendix D and Appendix E.

Zone 2

Criterion	*Standard*	*Instructions*
B	1	Not Applicable/De Minimis Effect: The facility does not alter the physical, chemical, or biotic water characteristics necessary to support fish and wildlife resources or human water uses (e.g., water supply or recreation)

Refer to Appendix A, Appendix D and Appendix E.

C. Upstream Fish Passage:

Zone 1

Criterion	*Standard*	*Instructions*
C	2	Agency Recommendation: • The facility is in compliance with science-based fish passage recommendations from appropriate resource agency(ies) which have been issued for the facility and which include provision for appropriate monitoring and effectiveness determinations.

Refer to Appendix G3

Zone 2

Criterion C	*Standard*	*Instructions*
C	2	Agency Recommendation: The facility is in compliance with science-based fish passage recommendations from appropriate resource agency(ies) which have been issued for the facility and which include provision for appropriate monitoring and effectiveness determinations.

Refer to Appendix G3

D. Downstream Fish Passage:

Zone 1

Criterion	*Standard*	*Instructions*
D	2	<u>Agency Recommendation:</u> • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). • Explain the scientific and technical basis for the agency recommendation including methods and data used. This is required regardless of whether the recommendation is part of a Settlement Agreement or not. • Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

Refer to Appendix A, pages 2-4. Refer also to Appendices G1-G5.

Refer to Appendix G, five letters from Dec, 2011, to July, 2014.

Refer to Appendix G5 letters from John Warshow to Dana Hall in July, 2014.

- "...The USF&WS has announced that the Connecticut River Salmon Restoration Project is being terminated. We have been advised VF&W that after the fall 2016 run there will no longer be any salmon migrating downstream...From our perspective, absent any communication or documentation to the contrary, the passage facility currently in place appropriately protective."

Subsequent to July, 2014, there has been no correspondence with any State or Federal agency indicating that the downstream fish way is in any way not adequately protective.

Also, subsequent to the letter from Rod Wentworth, VT Dept. of Fish and Wildlife (Refer to Appendix G3), Slack Dam has continued to operate the fish way as requested in Spring and Fall by the VT Dept of Fish and Wildlife.

Zone 2

Criterion	*Standard*	*Instructions*
D	2	<u>Agency Recommendation:</u> • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). • Explain the scientific and technical basis for the agency recommendation including methods and data used. This is required regardless of whether the recommendation is part of a Settlement Agreement or not. • Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

Refer to Appendix A, pages 2-4. Refer also Appendices G1-G5.

Refer to Appendix G, five letters from Dec, 2011 to July 2014.

Refer to Appendix G5 letters from John Warshow to Dana Hall in July 2014.

- "...The USF&WS has announced that the Connecticut River Salmon Restoration Project is being terminated. We have been advised VF&W that after the fall 2016 run there will no longer be any salmon migrating downstream...From our perspective, absent any communication or documentation to the contrary, the passage facility currently in place appropriately protective."

  Subsequent to July, 2014, there has been no correspondence with any State or Federal agency indicating that the downstream fish way is in any way not adequately protective.

  Also, subsequent to the letter from Rod Wentworth, VT Dept. of Fish and Wildlife (Refer to Appendix G3), Slack Dam has continued to operate the fish way as requested in Spring and Fall by the VT Dept of Fish and Wildlife.

E. Shoreline and Watershed Protection:

Zone 1

Criterion	*Standard*	*Instructions*
E	1	Not Applicable/De Minimis Effect: • There are no lands associated with the facility under ownership and control of the applicant that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation, and there has been no Shoreline Management Plan (SMP) or similar protection required at the facility; or the facility has no direct or indirect project-related land ownership, excluding lands used for power generation and transmission, flowage rights and required developed recreational amenities.

- There are no lands associated with the facility under ownership and control of the applicant that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation.

  There has been no Shoreline Management Plan (SMP) or similar protection required at the facility. The facility has no direct or indirect project-related land ownership, excluding lands used for power generation and transmission, flowage rights and required developed recreational amenities.

Refer to Appendices H1, H2, H3. Refer also to Appendix I1.

Zone 2

Criterion	*Standard*	*Instructions*
E	1	Not Applicable/De Minimis Effect: There are no lands associated with the facility under ownership and control of the applicant that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation, and there has been no Shoreline Management Plan (SMP) or similar protection required at the facility; or the facility has no direct or indirect project-related land ownership, excluding lands used for power generation and transmission, flowage rights and required developed recreational amenities.

- There are no lands associated with the facility under ownership and control of the applicant that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation.

  There has been no Shoreline Management Plan (SMP) or similar protection required at the facility. The facility has no direct or indirect project-related land ownership, excluding lands used for power generation and transmission, flowage rights and required developed recreational amenities.

Refer to Appendices H1, H2, and H3. Refer also to Appendix I1.

F. Threatened and Endangered Species:

Zone 1

Criterion	*Standard*	*Instructions*
F	1	Not Applicable/De Minimis Effect: • There are no listed species present in the facility area or downstream reach, and the facility was not responsible for the extirpation of the listed species if they were previously there.

- There are no listed species present in the facility area or downstream reach, and the facility was not responsible for the extirpation of the listed species if they were previously there. The question has never been raised as an issue by any State or Federal agency.

Zone 2

Criterion	*Standard*	*Instructions*
F	1	Not Applicable/De Minimis Effect: There are no listed species present in the facility area or downstream reach, and the facility was not responsible for the extirpation of the listed species if they were previously there.

- There are no listed species present in the facility area or downstream reach, and the facility was not responsible for the extirpation of the listed species if they were previously there. The question has never been raised as an issue by any State or Federal agency.

G. Cultural and Historic Resources:

Zone 1

Criterion	*Standard*	*Instructions*
G	1	Not Applicable/De Minimis Effect: • There are no cultural or historic resources present on facility lands that can be potentially threatened by construction or operations of the facility, or facility operations have not negatively affected those that are present, either recently or in the past.

- There are no cultural or historic resources present on facility lands that can be potentially threatened by construction or operations of the facility, or facility operations have not negatively affected those that are present, either recently or in the past.

  There has been no mention of this concern since the issuance of the Exemption in Sept. 1985.

Refer to Appendix B, Appendix H1, H2 and H3; Appendix I1 and I2. Refer also to Appendix C re Ferc dam safety inspection June-Sept, 2016.

Zone 2

Criterion	*Standard*	*Instructions*
G	1	Not Applicable/De Minimis Effect: There are no cultural or historic resources present on facility lands that can be potentially threatened by construction or operations of the facility, or facility operations have not negatively affected those that are present, either recently or in the past.

- There are no cultural or historic resources present on facility lands that can be potentially threatened by construction or operations of the facility, or facility operations have not negatively affected those that are present, either recently or in the past.

  There has been no mention of this concern since the issuance of the Exemption in Sept. 1985.

Refer to Appendix B, Appendix H1, H2 and H3; Appendix I1 and I2. Refer also to Appendix C re Ferc dam safety inspection June-Sept, 2016.

H. Recreational Resources:

Zone 1

Criterion	*Standard*	*Instructions*
H	1	Not Applicable/De Minimis Effect: • The facility does not occupy lands or waters to which the public can be granted access and does not otherwise impact recreational opportunities in the vicinity of the facility.

- There is no FERC or VT agency requirements on stakeholder recommendations for public access. Not withstanding the project provides free pedestrian access to the downstream (Zone 1) riverbank for recreation and fishing.

Refer to Appendices H1 and H2.

Zone 2

Criterion	*Standard*	*Instructions*
H	1	Not Applicable/De Minimis Effect: The facility does not occupy lands or waters to which the public can be granted access and does not otherwise impact recreational opportunities in the vicinity of the facility.

- There is no FERC or VT agency requirements on stakeholder recommendations for public access. Not withstanding the project provides free pedestrian access to the downstream (Zone 1) riverbank for recreation and fishing.

Refer to Appendices H1 and H3.

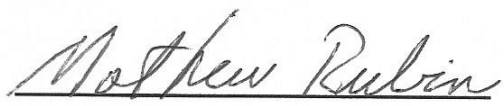
5. Sworn Statement and Waiver

As an Authorized Representative of _Springfield Hydroelectric Co._, the Undersigned attests that the material be presented in the application is true and complete.

The Undersigned acknowledges that the primary goal of the Low Impact Hydropower Institute's Certification Program is public benefit, and the the LIHI Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The undersigned further acknowledges that if certification of the applying facility is issued, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified.

The undersigned Applicant further agrees to hold the Low Impact Hydropower Institute, the Governing Board and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's Certification Program.



Mathew Rubin, General Partner

6. Applicant Contacts Form

1. Facility Contacts

Project Owner	
Name and Title	Mathew Rubin General Partner
Company	Springfield Hydroelectric Co
Phone	802-223-7141
Email Address	m@mrubin.biz
Mailing Address	26 State St, Montpelier, VT 05602
Project Operator (if different from Owner)	
Name and Title	AS ABOVE
Company	
Phone	
Email Address	
Mailing Address	
Consulting Firm/ Agent for LIHI Program (if different from above):	
Name and Title	AS ABOVE
Company	
Phone	
Email Address	
Mailing Address	
Compliance Contact (responsible for LIHI Program requirements):	
Name and Title	AS ABOVE
Company	
Phone	
Email Address	
Mailing Address	
Party responsible for accounts payable:	
Name and Title	AS ABOVE
Company	
Phone	
Email Address	
Mailing Address	

Appendix A LIHI Certification Report and Record of Contacts Oct 27, 2011

Link to email from Brian Fitzgerald to John Warshow:
http://lowimpacthydro.org/wp-content/uploads/2011/10/WQC-jan-2011-update062.pdf

From: "John Warshow" <jwarshow@sover.net>
Subject: **FW: LIHI Certification - Winooski-8 and Slack Dam**
Date: January 10, 2011 10:59:08 AM EST
To: "'Fred Ayer'" <fayer@lowimpacthydro.org>
Cc: "'Mathew Rubin'" <mrubin@sover.net>

John Warshow

From: Fitzgerald, Brian [mailto:Brian.Fitzgerald@state.vt.us]
Sent: Monday, January 10, 2011 10:22 AM
To: John Warshow (jwarshow@smdhydro.com)
Cc: Kirn, Rich; McMenemy, Jay
Subject: LIHI Certification - Winooski-8 and Slack Dam

John,

You called recently and indicated that you are applying for Low Impact Hydropower Institute certification for the Winooski-8 and Slack Dam projects. You requested that the Agency document compliance with the projects' water quality certifications and whether the projects are located on impaired waters, i.e., the state 303(d) list.

Winooski-8: This project is operating under a water quality certification issued on Dec. 29, 1982 and amended on April 5, 1984. Generally, the project operates in compliance with the conditions of the certification. This reach of the Winooski River is not listed on the most recent (2008) list of impaired waters.

Slack Dam: This project is operating under a water quality certification issued on Jan. 31, 1985 and amended on March 10, 1986. Generally, the project operates in compliance with the conditions of the certification. This reach of the Black River is not listed on the most recent (2008) list of impaired waters.

Please let me know if you need additional information.

BT

Brian T. Fitzgerald
Vermont Agency of Natural Resources
Department of Environmental Conservation
Water Quality Division
103 South Main Street, 10 North
Waterbury, VT 05671-0408

802.241.3468
802.793.0454 (cell)
brian.fitzgerald@state.vt.us
http://www.vtwaterquality.org
Conservation is a cause that has no end. There is no point at which we will say our work is finished.
- Rachel Carson

P Please consider the environment before printing this e-mail

Appendix A (continued)

Review of Low Impact Hydropower Institute Application
for Low Impact Hydropower Certification:
Slack Dam Hydroelectric Project

Introduction and Overview

This report reviews the application submitted by Springfield Hydroelectric Company (applicant) to the Low Impact Hydropower Institute (LIHI) for Low Impact Hydropower Certification for the Slack Dam Hydroelectric Project (project or facility) located on the Black River in Springfield, Vermont. The Federal Energy Regulatory Commission (FERC) exempted the project (FERC 8014) from licensing in 1985 for the operation and maintenance of the 400 kilowatt run-of-river project.

Project and site characteristics.

The project is located in Springfield, Vermont on the Black River, which is a tributary to the Connecticut River. The dam, located at River Mile 4.2 upstream of the confluence of the Black and Connecticut Rivers, is one of five existing concrete gravity dams on the Black River in Springfield. (Comtu Falls site is immediately upstream, and the Lovejoy Dam site is just 0.2 river miles downstream.) The project was reconstructed in 1986 and has an installed capacity of 400 KW. Annual energy production has averaged 2,000,000 KWH. The project is a strict run-of-river operation utilizing 21-feet of gross head, between the headwater and tailwater. There is no bypass reach. The project is served by a 190 square mile drainage area on the Black River, 75% of which is controlled by the U.S. Army Corps of Engineers Flood Control Project in North Springfield, 4.5 miles upstream. A steel penstock 8' in diameter and 80' in length conducts water from the intake to the powerhouse.

The power house is 20' x 20' square and houses one horizontal full Kaplan turbine driving a vertical induction generator by means of an internal bevel gear, together with associated hydraulic, mechanical, electrical and electronic equipment. The powerhouse is constructed of reinforced concrete to an elevation greater than the 100 year flood level. A pad mounted transformer connects the station to 3-phase 4,160 V electrical service. A fishway, constructed in 2007, provides for downstream fish passage.

FERC Exemption: On January 30, 1984, Sterling Enterprises, Inc. (the previous owners) filed an application for an exemption from licensing for its proposed Hydropower Project. FERC issued an exemption from licensing on September 30, 1985. The exemption included Standard Article 2, which requires compliance with any terms and conditions that federal and state fish and wildlife agencies have determined appropriate to prevent loss of, or damage to, fish and wildlife resources.

Black River fishery. The Black River is part of the Connecticut River system. Historic records indicate that Atlantic salmon ascended the mainstem Connecticut River to its very headwaters (as far north as Beechers Falls, Vermont) and likely entered all major tributaries not blocked by natural barriers. Precise numbers of salmon that entered the river and its various tributary systems are unknown because early settlers did not enumerate the migrating fish as extirpation predated the development of fishery science.

Appendix A (continued)

The native salmon population disappeared soon after the construction of impassable dams. The first dam to be built across the mainstem Connecticut River was constructed in 1798 near the present site of Turners Falls, Massachusetts. It blocked the access of salmon to spawning habitat in the upper portion of the watershed, and the species disappeared from the river a few years later.[1]

Beginning in 1967, a program to restore anadromous fish to the Connecticut River was initiated and in 1983 Congress passed the Connecticut River Basin Atlantic Salmon Compact, which formalized state and federal agreements for restoring the fishery. This action created the Connecticut River Atlantic Salmon Commission, which guides the restoration of salmon to the basin. Providing upstream fish passage at dams on the river has been an important aspect of migratory fish restoration. Efforts to provide downstream fish passage on both mainstem and tributary projects were initiated in the 1980s and have been ongoing.

The Black River supports populations of Atlantic salmon, brown trout, rainbow trout, and brook trout. At the present time, Atlantic salmon occur in the Black River solely as a result of annual stocking of fry into suitable juvenile nursery habitat. This stocking is being done as part of the multi-state and federal fishery agency program for the restoration of anadromous Atlantic salmon to the Connecticut River basin as noted above. Fry stocking in the Black River makes use of abundant juvenile habitat for producing salmon smolts, which will migrate out to sea and hopefully contribute to increasing adult salmon returns to the Connecticut River.[2]

According to correspondence between the LIHI Reviewer and the State of Vermont fisheries biologist, stocking of Atlantic salmon fry has occurred every year since at least 1995 upstream of Slack Dam. State biologists also confirmed that salmon used the Black River before extensive damming of the Connecticut River Watershed. In addition, they believe that eels were historically present above the Slack Dam project although they are now absent.

Significant Issues. The adequacy of downstream fish passage at the facility is an unresolved issue at Slack Dam. The relevant background is the following.

(1) The basis for the fish passage that is required as part of the federal license is Standard Article 2 in the applicant's license exemption. By letters date December 27, 1983 and March 5, 1985, the USFWS provided FERC with their terms and conditions for the project. Condition 1 states:

> "The Exemptee shall provide fish-passage facilities at this project when prescribed by USFWS or the Vermont Department of Fish and Wildlife (VTDFW). Design, construction and operation of fish-passage facilities will be the responsibility of the Exemptee; however, approval of the design by USFWS will be necessary. Any additional instantaneous flows for operation of these facilities will also be provided by the Exemptee, as prescribed by USFWS"

[1] Strategic Plan for the Restoration of the Atlantic Salmon to the Connecticut River, Revised July 1, 1998.
[2] Basin 10 Black River and Ottauquechee River Watersheds Water Quality and Aquatic Habitat Assessment Report, 1995.

Appendix A (continued)

Further, Condition 8 states:

"USFWS is (sic) reserved the right to add and alter terms and conditions as appropriate to carry out its responsibilities during the life of the project with respect to fish and wildlife resources...."

Finally, Condition 9 states:

"The Exemptee shall incorporate the aforementioned fish and wildlife conditions in any conveyance - by lease, sale or otherwise - of his interests so as to legally assure compliance with said conditions for as long as the project operates under an exemption from licensing."

(2) Based on the initiation of upstream stocking of Atlantic salmon smolts some years after the FERC exemption was issued, the USFWS wrote to the applicant (September 22, 2006) and stated:

"While we knew that the facilities you installed were not sufficient to provide effective, safe passage for downstream migrants, there was no need to make modifications at that point in time because no salmon fry were being stocked upstream of the dam and no adult pre-spawned fish were able to pass upstream either. However, fry stocking of the Black River was initiated in 1993 and the applicant was notified that passage likely would be needed by the spring of 1995. "

(3) In conducting research for the LIHI Certification, the Reviewer contacted the State and Federal fishery agencies to determine if the downstream fish passage issues raised in 2006 by USFWS had been adequately resolved. Per an email dated, 9/22/ 2011, USFWS notified the LIHI reviewer that there were outstanding issues with the downstream fish bypass facility at Slack Dam and that it does not conform to USFWS design criteria. USFWS forwarded a memorandum from their fishway engineer that outlined their concerns with the hydraulics at the entrance. At the same time, the USFWS acknowledged to the Reviewer that it had not followed up with the applicant as it intended in 2008 after contact with the applicant, to work on the kinds of changes in downstream passage that it believed might be necessary, and that given this situation it would support certification so long as the downstream fish passage issues were resolved by early 2013.

Public comment and agency letters. The public comment period closed on April 18, 2011. LIHI did not receive any public comment or agency letters on this project.

General conclusions. The challenge presented by the application of the Slack Dam Project is that there are outstanding issues regarding downstream fish passage that need to be addressed. Correspondence with the State and Federal fishery agencies revealed that not all issues pertaining to downstream fish passage had been adequately resolved. Although the State believes the downstream measures are "appropriately protective" of the salmon resource, the USFWS is not certain based on an inspection conducted three years ago, but acknowledges that it has been remiss in not following up with the applicant. The applicant has stated a willingness to

Appendix A (continued)

work with USFWS to either demonstrate the current passage is "adequately protective" or to make needed changes. USFWS suggested that certification be conditioned requiring the applicant to address the downstream bypass design deficiencies by April 1, 2013 and that any modifications must be approved by the USFWS prior to their implementation.

Under these circumstances, I recommend that LIHI conditionally certify the project, with a condition that directs Springfield Hydroelectric Company ("Springfield," the applicant) to initiate consultation with USFWS and the Vermont Department of Fish and Wildlife immediately upon receipt of certification, to determine whether the current downstream passage at the project is appropriately protective, and to report to LIHI within four months -- by March 1, 2012 -- as to whether agreement has been reached, if it not deemed appropriately protective, on either changes that Springfield will make at the project, or on downstream passage effectiveness testing by Springfield in 2012. If downstream effectiveness testing is required, Springfield shall report to LIHI by November 1, 2012 on results of testing unless a different date is mutually agreed upon by certificate holder, the USFWS and Vermont Department of Fish and Wildlife. If results do not show adequate effectiveness, Springfield shall also report to LIHI as to whether agreement has been reached on changes in downstream passage that will be implemented and operational by April 1, 2013.

Recommendation. Based on my review of information submitted by the applicant, my review of additional documentation, and my consultations with resource agency staff, I believe the Slack Dam Project CONDITIONALLY MEETS all of the criteria, and I therefore RECOMMEND that the project be certified subject to the following CONDITION:

- Upon receipt of certification, Springfield Hydroelectric Company ("Springfield") must initiate a new round of consultations with the USFWS and the Vermont Department of Fish and Wildlife Department (collectively, the agencies) to determine whether the current downstream passage at its project is appropriately protective, and to report to LIHI by **March 1, 2012** as to whether the agencies have deemed it appropriately protective. If the agencies determine that it is not appropriately protective, Springfield shall provide an agreement has been reached with the agencies providing for either fishway modifications or downstream passage effectiveness testing by Springfield in 2012.

- If downstream effectiveness testing is required, Springfield shall report to LIHI by **November 1, 2012** on the results of the testing unless a different date is mutually agreed upon by Springfield and the agencies.

- If results do not show adequate effectiveness to be appropriately protective, Springfield shall also report to LIHI as to whether agreement has been reached on fishway modifications that will be implemented and operational by **April 1, 2013**.

- LIHI reserves right to suspend certification if the above steps are not completed, if no agreement is reached with the agencies; or if required measures to ensure

Appendix A (continued)

downstream passage is appropriately protective of the Atlantic salmon resource are not made by April 1, 2013.

Low Impact Certification Criteria

A. Flows

1) Is the Facility in *Compliance* with *Resource Agency Recommendations* issued after December 31, 1986 regarding flow conditions for fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations) for both the reach below the tailrace and all bypassed reaches?

NA. The recommendation was issued prior to January 1, 1987.

If YES, go to B.
If NOT APPLICABLE, go to A2.
If NO, project fails.

2) If there is no flow condition recommended by any Resource Agency for the Facility, or if the recommendation was issued prior to January 1, 1987, is the Facility in Compliance with a flow release schedule, both below the tailrace and in all bypassed reaches, that at a minimum meets Aquatic Base Flow standards or "good" habitat flow standards calculated using the Montana-Tennant method?

Yes. The Facility is operated in an instantaneous run-of-river mode, as required by the project water quality certification, which also requires 0.5 inch of spillage. Run-of-river operations mode meets the minimum LIHI standard as there is no bypass reach. According to an email from a State of Vermont Water Quality Specialist at the Dept. of Environmental Conservation dated 6/13/2011, the project is in compliance with WQ Certification flow requirements.

If YES, go to B
If NO, go to A3.

PASS.

B. Water Quality

Appendix A (continued)

1) **Is the Facility either:**
a) **In Compliance with all conditions issued pursuant to a Clean Water Act Section 401 water quality certification issued for the Facility after December 31, 1986? Or**
b) **In Compliance with the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act in the Facility area and in the downstream reach?**

Yes for 1b). Email correspondence dated 8/26/2011 from Brian Fitzgerald, State of Vermont Water Quality Specialist at the Department of Environmental Conservation, stated that "there is reasonable assurance that the waters at these facilities and in the downstream reaches are in compliance with Vermont's quantitative water quality standards for this project."

If YES, go to B2.
If NO, project fails.

2) **Is the Facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and designated uses) pursuant to Section 303(d) of the Clean Water Act?**

No. Email correspondence dated 1/10/2011 from the Vermont Agency of Natural Resources, Department of Environmental Conservation, states that this reach of the Black River is not listed on the most recent (2010) list of impaired waters.

If YES, go to B3.
If NO, go to C.

PASS.

C. Fish Passage and Protection

1) **Is the Facility in Compliance with *Mandatory Fish Passage Prescriptions* for upstream and downstream passage of anadromous and catadromous fish issued by Resource Agencies after December 31, 1986?**

NA.

If YES, go to C5.
If NOT APPLICABLE, go to C2.
If NO, project fails.

Appendix A (continued)

2) Are there historic records of anadromous and/or catadromous fish movement through the Facility area, but anadromous and/or catadromous fish do not presently move through the Facility area (e.g., because passage is blocked at a downstream dam or the fish run is extinct)?

State biologists stated that it is highly likely that salmon used the Black River before extensive damming of the Connecticut River mainstem. Salmon fry are stocked upstream, and, therefore, salmon now pass downstream through the Facility area. In addition, eels were historically present above the Slack Dam project although they are now absent; no restoration plans are in place at this time.

Yes to salmon upstream passage, go to C.2.a.

No to salmon downstream passage, go to C.3.

Yes to eels, go to C.2.a.

a) If the fish are extinct or extirpated from the Facility area or downstream reach, has the Applicant demonstrated that the extinction or extirpation was not due in whole or part to the Facility?

Salmon are present below the dam as a result of upstream passage facilities in place at the Connecticut River, but do not have access above Lovejoy Dam, which is in Springfield village downstream of Slack Dam. Eel passage is not provided at the many downstream dams; there is no restoration plan in place.
Yes to salmon upstream passage, go to C.2.b.
Yes to eels, go to C.2.b.

b) If a Resource Agency Recommended adoption of upstream and/or downstream fish passage measures at a specific future date, or when a triggering event occurs (such as completion of passage through a downstream obstruction or the completion of a specified process), has the Facility owner/operator made a legally enforceable commitment to provide such passage?

No resource agency has Recommended upstream passage of salmon or eel passage at this dam.

N/A for salmon upstream passage, go to C.3.
N/A for eels, go to C.3.

3) If, since December 31, 1986:

a) Resource Agencies have had the opportunity to issue, and considered issuing, a Mandatory Fish Passage Prescription for upstream and/or downstream passage of anadromous or catadromous fish (including delayed installation as described in

Appendix A (continued)

C2a above), and

b) The Resource Agencies declined to issue a Mandatory Fish Passage Prescription,

c) Was a reason for the Resource Agencies' declining to issue a Mandatory Fish Passage Prescription one of the following: (1) the technological infeasibility of passage, (2) the absence of habitat upstream of the Facility due at least in part to inundation by the Facility impoundment, or (3) the anadromous or catadromous fish are no longer present in the Facility area and/or downstream reach due in whole or part to the presence of the Facility?

There is no record of consideration of upstream passage facilities for salmon nor for eel passage facilities. Regardless none of the limiting reasons would apply.

N/A for both salmon upstream passage and eels, to C.4.

4) If C3 was not applicable:

a) Are upstream and downstream fish passage survival rates for anadromous and catadromous fish at the dam each documented at greater than 95% over 80% of the run using a generally accepted monitoring methodology?

With respect to downstream passage of salmon smolts, the applicant does not know the answer to this; there is no current testing. There is no upstream passage of adult salmon.

Or

b) If the Facility is unable to meet the fish passage standards in 4.a, has the Applicant either i) demonstrated, and obtained a letter from the U.S. Fish and Wildlife Service or National Marine Fisheries Service confirming that demonstration, that the upstream and downstream fish passage measures (if any) at the Facility are appropriately protective of the fishery resource, or ii) committed to the provision of fish passage measures in the future and obtained a letter from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service indicating that passage measures are not currently warranted?

Although the State believes the downstream measures are "appropriately protective" of the salmon resource, the USFWS is not certain based on an inspection conducted three years ago, but acknowledges that it has been remiss in not following up with the applicant. The applicant has stated a willingness to work with USFWS to either demonstrate the current passage is "adequately protective" or to make needed changes.

Under these circumstances, I recommend that LIHI conditionally certify, with a condition that directs the applicant to immediately upon receipt of certification initiate consultation with USFWS to determine whether downstream passage is appropriately protective, and to report to LIHI within four months -- by March 1, 2012 -- as to whether agreement has been reached on changes or on a testing protocol for 2012. If a testing protocol,

Appendix A (continued)

certificate holder will report to LIHI by November 1, 2012 on results of testing unless different date mutually agreed upon by certificate holder and USFWS. If results don't show effective, report will also contain information on whether agreement has been reached on changes in downstream passage that will be implemented and operational by April 1, 2013. LIHI reserves right to suspend certification if steps are not completed, or if no agreement with resource agency and implementation to ensure downstream passage is appropriately protective of salmon resource.

There are no plans for eel restoration at this time.

YES, go to C5.

5) Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and/or downstream passage of *Riverine* fish?

NA. No prescription has been issued.

If YES, go to C6.
If NOT APPLICABLE, go to C6.
If NO, project fails.

6) Is the Facility in Compliance with Resource Agency Recommendations for Riverine, anadromous and catadromous fish entrainment protection, such as tailrace barriers?

The agencies did not request any special measures to prevent fish entrainment.

If YES or NOT APPLICABLE, go to D
If NO, project fails.

CONDITIONALLY PASS.

D. Watershed Protection

1) Is there a buffer zone dedicated for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low-impact recreation) extending 200 feet from the high water mark in an average water year around 50 - 100% of the impoundment, and for all of the undeveloped shoreline

NA. No buffer zone was required as part of the FERC exemption process.

If YES = Pass, go to E and receive 3 extra years of certification
If NO = go to D2

Appendix A (continued)

2) Has the facility owner/operator established an approved watershed enhancement fund that: 1) could achieve within the project's watershed the ecological and recreational equivalent of land protection in D.1.,and 2) has the agreement of appropriate stakeholders and state and federal resource agencies?

No.

If YES = Pass, go to E and receive 3 extra years of certification
If NO = go to D3

3) Has the facility owner/operator established through a settlement agreement with appropriate stakeholders and that has state and federal resource agencies agreement an appropriate shoreland buffer or equivalent watershed land protection plan for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low impact recreation)

No.

If YES = Pass, go to E
If NO = go to D4

4) Is the facility in compliance with both state and federal resource agencies recommendations in a license approved shoreland management plan regarding protection, mitigation or enhancement of shorelands surrounding the project.

NA. There is no required shoreland management plan.

If YES = Pass, go to E
If No = Fail

PASS.

E. Threatened and Endangered Species Protection

1) Are threatened or endangered species listed under state or federal Endangered Species Acts present in the Facility area and/or downstream reach?

No.

If YES, go to E2.
If NO, go to F.

Appendix A (continued)

PASS.

F. Cultural Resource Protection

1) If FERC-regulated, is the Facility in Compliance with all requirements regarding Cultural Resource protection, mitigation or enhancement included in the FERC license or exemption?

Yes, a letter dated 7/15/1996 from FERC states that the applicant is in compliance with the cultural provisions of their exemption.

If YES, go to G.
If NOT APPLICABLE, go to F.2

PASS.

G. Recreation

1) If FERC-regulated, is the Facility in Compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license or exemption?

NA. The facility is FERC-regulated, however, there were no requirements listed in the exemption regarding recreational access, accommodation and facilities conditions in its exemption. A letter dated 7/15/1996 from FERC stated that there is no formal recreation at the project since it is located in the industrial center of town. They note that informal bank fishing occurs downstream.

If YES, go to G3.
If NOT APPLICABLE, go to G2.
If NO, project fails.

2) Does the Facility allow access to the reservoir and downstream reaches without fees or charges?

Appendix A (continued)

Yes, the project provides opportunities to the public, at no charge, including kayak races, fishing and public access.

If YES, go to H.
If NO, project fails.

PASS.

H. Facilities Recommended for Removal

1) Is there a Resource Agency Recommendation for removal of the dam associated with the Facility?

No.

If NO, facility is low impact.
If YES, the project fails.

PASS.

FACILITY IS CONDITIONALLY LOW IMPACT

Appendix A (continued)

RECORD OF CONTACTS

Date of Conversation:	6/13/2011
Application Reviewer:	Jackie Dingfelder, Consultant
Person Contacted:	Brian Fitzgerald, Vermont Dept. of Environmental Conservation
Telephone/email:	802.241.3468/brian.fitzgerald@state.vt.us
Areas of Expertise:	Streamflow Protection Coordinator

Jackie,

Thanks for your voicemail and email.

Compliance with water quality certification conditions at both projects includes meeting flow requirements, so both projects are in compliance with respect to flows.

For comments specifically on fisheries impacts, you should contact the appropriate district fisheries biologist in the Vt. Department of Fish and Wildlife:

Slack Dam: Jay McMenemy, jay.mcmenemy@state.vt.us or 802.885.8829
Winooski-8: Rich Kirn, rich.kirn@state.vt.us or 802.485.7566

Please let me know if you need additional information.

BT

Brian T. Fitzgerald
Streamflow Protection Coordinator

Vermont Agency of Natural Resources
Department of Environmental Conservation
Water Quality Division
103 South Main Street, 10 North
Waterbury, VT 05671-0408

802.241.3468
802.793.0454 (cell)

brian.fitzgerald@state.vt.us
http://www.vtwaterquality.org

Appendix A (continued)

Date of Conversation:	8/26/2011
Application Reviewer:	Jackie Dingfelder, Consultant
Person Contacted:	Brian Fitzgerald, Vermont Dept. of Environmental Conservation
Telephone/email:	802.241.3468/brian.fitzgerald@state.vt.us
Areas of Expertise:	Streamflow Protection Coordinator

Jackie:

Fred Ayer requested confirmation of compliance with Vermont's quantitative water quality standards for the Winooski-8 (Winooski River) and Slack Dam (Black River) hydroelectric projects. Based on available information, there is reasonable assurance that the waters at these facilities and in the downstream reaches are in compliance.

Please contact me if you have questions.

BTF

Brian T. Fitzgerald
Streamflow Protection Coordinator

Vermont Agency of Natural Resources
Department of Environmental Conservation
Water Quality Division
103 South Main Street, 10 North
Waterbury, VT 05671-0408

802.241.3468
802.793.0454 (cell)

brian.fitzgerald@state.vt.us
http://www.vtwaterquality.org

Appendix A (continued)

Date of Conversation:	6/12/2011
Application Reviewer:	Jackie Dingfelder, Consultant
Person Contacted:	James McMenemy, Vermont Fish and Wildlife Dept.
Telephone/email:	802-885-8829/jay.mcmenemy@state.vt.us
Areas of Expertise:	Fisheries Biologist

Hi Jackie,

Sorry about not responding to your voice mail sooner.

Slack has downstream passage that VTFW is satisfied with. They also operate as a run of river facility and I am not aware of any compliance issues.

Fifteen Mile Falls and Vernon were LIHI certified despite strong objections from multiple agencies regarding fish passage and flow issues. I don't see how you could not certify Slack, which actually is meeting the criteria.

Jay

James R. McMenemy
Fisheries Biologist
Vermont Fish and Wildlife Department
100 Mineral Street, Suite 302
Springfield, VT 05156-3168
Telephone: (802) 885-8829
Fax: (802) 885-8890
jay.mcmenemy@state.vt.us

Date of Conversation:	9/22/2011
Application Reviewer:	Jackie Dingfelder, Consultant
Person Contacted:	Melissa Grader, USFWS
Telephone/email:	413-548-9138 x124/ Melissa_Grader@fws.gov
Areas of Expertise:	Fisheries Biologist

Hi Jackie,

I've had a chance to review our files, and it looks like where we left off was back in Nov. of 2008 I sent John Warshow an email detailing the issues our fishway engineer had with the way John constructed his downstream bypass. John's response was that his preference was to wait until the d/s bypass facility was complete (meaning, I believe, that all issues had been resolved) before he would move forward with his LIHI certification request. I had said that I would forward John our fishway engineer's memo with the details of the issues, but it looks like I never did that. I have attached that memo, and the Nov. 2008 email exchange, for your information.

Appendix A (continued)

I realize that VT DFW indicated they were satisfied with the d/s fishway at Slack, and I think that some of the design issues may not need modification, but the hydraulics at the entrance are a concern that will need to be addressed.

Based on this review, the FWS recommends that if LIHI certifies the Slack Dam, the certification contain a condition requiring Mr. Warshow to address the d/s bypass design deficiencies by April 1, 2013, and that any modifications must be approved by the FWS prior to their implementation.

Thank you for the opportunity to comment on this LIHI certification process.

Sincerely,
Melissa
(See attached file: SlackVT5Dec08.MEM.doc)(See attached file: Slack fish passage nov 08 emails.pdf)

Melissa Grader
Fish and Wildlife Biologist
US FWS/New England Field Office
c/o CT River Coordinator's Office
103 East Plumtree Road
Sunderland, MA 01375
413-548-8002, x124
413-548-9622 (FAX)
melissa_grader@fws.gov
www.fws.gov/newengland

Date of Conversation:	9/27/2011
Application Reviewer:	Jackie Dingfelder, Consultant
Person Contacted:	Melissa Grader, USFWS
Telephone/email:	413-548-9138 x124/ Melissa_Grader@fws.gov
Areas of Expertise:	Fisheries Biologist

Downstream passage is required to protect outmigrating Atlantic salmon smolts. All other hydro facilities on the Black River have d/s passage also.

Mr. Warshow installed a d/s bypass facility that does not conform to Service design criteria. We visited the site during/after the initial install, and as noted in our fishway engineer's memorandum, there are concerns with the hydraulics at the entrance. I have no idea how much modifying the entrance might cost.

I proposed April 1 of 2013 because the d/s passage season starts April 1st annually, and that

Appendix A (continued)

would give Mr. Warshow about 15 months to consult with us on acceptable ways to solve the hydraulic issue, and to implement any changes.

Regards,
Melissa

Date of Conversation:	9/28/2011
Application Reviewer:	Jackie Dingfelder, Consultant
Person Contacted:	Rod Wentworth, Vermont Fish and Wildlife Dept.
Telephone/email:	802-560-5588/rod.wentworth@state.vt.us
Areas of Expertise:	Fisheries Biologist

The reviewer had an extensive phone interview with Mr. Wentworth. He stated that the Slack Dam project has a 10-year history of working to resolve fish passage issues on the Black River. The State fishery biologists rely on the USFWS engineers regarding effective of the fish passage design and thus defer on the USFWS approval of the design.

Date of Conversation:	9/28/2011
Application Reviewer:	Jackie Dingfelder, Consultant
Person Contacted:	Rod Wentworth, VT Dept. of Fish and Wildlife
Telephone/email:	(802)241-3709/ rod.wentworth@state.vt.us
Areas of Expertise:	Fisheries Biologist

Jackie, I did some looking around. The Black River is planned for non-natal salmon production, which means fry stocking but not trying to get adults to the habitat, possibly because there are so many dams. Stocking has been done every year since at least 1995 upstream of Slack. It is in my opinion highly likely that salmon used the Black River before extensive damming of the CT R watershed. I do not however have documentation available on that. I have read accounts of historical American eel use on the Black River, well upstream of Slack. Access the salmon plan at www.fws.gov/r5crc/pdf/strplan.pdf You can find a list of Black R dams at www.fws.gov/r5crc/Stuff/appg.html

And or Champlain: http://www.dec.ny.gov/docs/regions_pdf/09lcfishplan.pdf

Rod Wentworth
VT Dept. of Fish & Wildlife
103 South Main Street
Waterbury, VT 05671-0501
Phone: (802)241-3709
Fax: (802)241-3295

Appendix A (continued)

Date of Conversation:	9/30/2011
Application Reviewer:	Jackie Dingfelder, Consultant
Person Contacted:	James McMenemy, Vermont Fish and Wildlife Dept.
Telephone/email:	802-885-8829/jay.mcmenemy@state.vt.us
Areas of Expertise:	Fisheries Biologist

Rod is correct. Eels were present above Slack historically although they are absent now. Salmon certainly got at least to Comtu Falls, just above Slack, and likely above and throughout the watershed. However, there is no documentation because they were gone by 1798.

There is downstream passage for salmon in place at all the dams on the Black, including Slack. No upstream passage is planned at this time. Salmon currently have access to the lower Black River below Lovejoy Dam.
Jay

James R. McMenemy
Fisheries Biologist
Vermont Fish and Wildlife Department
100 Mineral Street, Suite 302
Springfield, VT 05156-3168
Telephone: (802) 885-8829
Fax: (802) 885-8890
jay.mcmenemy@state.vt.us

Date of Conversation:	10/3/2011
Application Reviewer:	Jackie Dingfelder, Consultant
Person Contacted:	Rod Wentworth, VT Dept. of Fish and Wildlife
Telephone/email:	(802)241-3709/ rod.wentworth@state.vt.us
Areas of Expertise:	Fisheries Biologist

Jackie, Jay has now retired from VDFW. You will note in the 'salmon plan' that Lovejoy is the first dam (most downstream) in the Black River and concerning upstream passage, is listed as not passable. Eels have been known to go around dams, overland, on rainy nights. While it is possible that they sometimes pass Lovejoy, I am not aware of any documentation of it. There are 5 dams on the Black River within a mile in Springfield, and I'm sure that collectively they do a good job of preventing upstream fish passage. Upstream passage is not planned for salmon; instead the upper Black river is stocked with fry. My Department has not made any plans related to eel recovery and passage, other than to address passage opportunistically at specific dams, such as during relicensing. Eel passage at Slack dam has not been discussed. You may want to check with the USFWS on this matter as they have been more active in eel restoration.

Appendix A (continued)

Rod Wentworth
VT Dept. of Fish & Wildlife
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Phone: (802)241-3709
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Email: rod.wentworth@state.vt.us
***Vermont**: Respect. Protect. Enjoy*

Date of Conversation:	10/4/2011
Application Reviewer:	Jackie Dingfelder, Consultant
Person Contacted:	Melissa Grader, USFWS
Telephone/email:	413-548-9138 x124/ Melissa_Grader@fws.gov
Areas of Expertise:	Fisheries Biologist

Eel passage is not needed at the Slack Dam at this time. Eel passage facilities exist at the Holyoke Dam on the Connecticut River, but not at Cabot (Turners Falls), Vernon or Bellows Falls dams. Once upstream passage is in place at those mainstem dams we likely will start seeking passage at projects on the Black River.

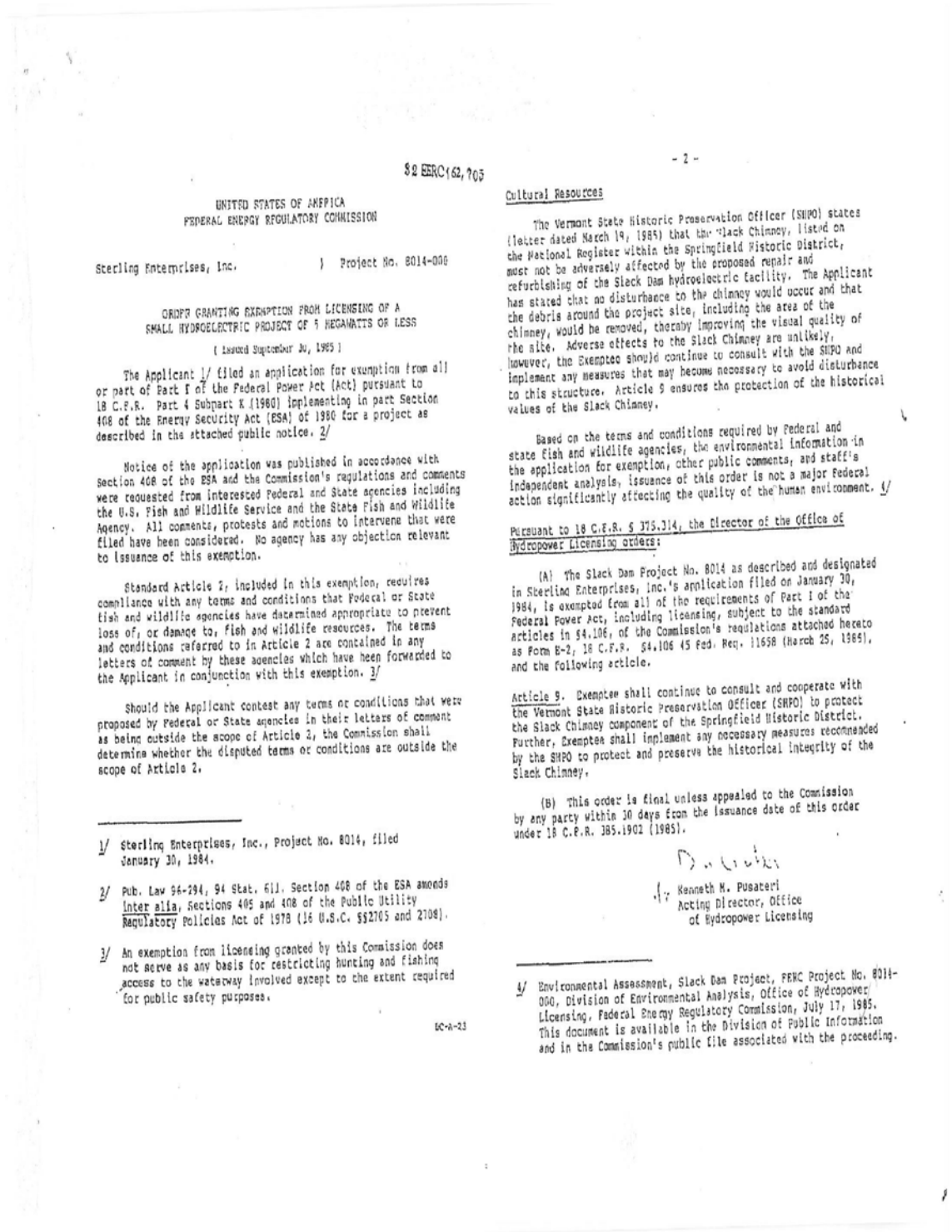
Regards,

Melissa

Melissa Grader
Fish and Wildlife Biologist
US FWS/New England Field Office
c/o CT River Coordinator's Office
103 East Plumtree Road
Sunderland, MA 01375
413-548-8002, x124
413-548-9622 (FAX)
melissa_grader@fws.gov

Appendix B FERC Exemption 8012-VT Sept, 1985

Link to LIHI CERT #78:
http://lowimpacthydro.org/wp-content/uploads/2011/10/doc.Slackexemption053.pdf



32 FERC ¶62,705

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Sterling Enterprises, Inc.) Project No. 8014-000

ORDER GRANTING EXEMPTION FROM LICENSING OF A SMALL HYDROELECTRIC PROJECT OF 5 MEGAWATTS OR LESS

(Issued September 30, 1985)

The Applicant 1/ filed an application for exemption from all or part of Part I of the Federal Power Act (Act) pursuant to 18 C.F.R. Part 4 Subpart K (1980) implementing in part Section 408 of the Energy Security Act (ESA) of 1980 for a project as described in the attached public notice. 2/

Notice of the application was published in accordance with Section 408 of the ESA and the Commission's regulations and comments were requested from interested Federal and State agencies including the U.S. Fish and Wildlife Service and the State Fish and Wildlife Agency. All comments, protests and motions to intervene that were filed have been considered. No agency has any objection relevant to issuance of this exemption.

Standard Article 2, included in this exemption, requires compliance with any terms and conditions that Federal or State fish and wildlife agencies have determined appropriate to prevent loss of, or damage to, fish and wildlife resources. The terms and conditions referred to in Article 2 are contained in any letters of comment by these agencies which have been forwarded to the Applicant in conjunction with this exemption. 3/

Should the Applicant contest any terms or conditions that were proposed by Federal or State agencies in their letters of comment as being outside the scope of Article 2, the Commission shall determine whether the disputed terms or conditions are outside the scope of Article 2.

1/ Sterling Enterprises, Inc., Project No. 8014, filed January 30, 1984.

2/ Pub. Law 96-294, 94 Stat. 611. Section 408 of the ESA amends inter alia, Sections 405 and 408 of the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. §§2705 and 2708).

3/ An exemption from licensing granted by this Commission does not serve as any basis for restricting hunting and fishing access to the waterway involved except to the extent required for public safety purposes.

DC-A-23

- 2 -

Cultural Resources

The Vermont State Historic Preservation Officer (SHPO) states (letter dated March 19, 1985) that the Slack Chimney, listed on the National Register within the Springfield Historic District, must not be adversely affected by the proposed repair and refurbishing of the Slack Dam hydroelectric facility. The Applicant has stated that no disturbance to the chimney would occur and that the debris around the project site, including the area of the chimney, would be removed, thereby improving the visual quality of the site. Adverse effects to the Slack Chimney are unlikely, however, the Exemptee should continue to consult with the SHPO and implement any measures that may become necessary to avoid disturbance to this structure. Article 9 ensures the protection of the historical values of the Slack Chimney.

Based on the terms and conditions required by Federal and state fish and wildlife agencies, the environmental information in the application for exemption, other public comments, and staff's independent analysis, issuance of this order is not a major Federal action significantly affecting the quality of the human environment. 4/

Pursuant to 18 C.F.R. § 375.314, the Director of the Office of Hydropower Licensing orders:

(A) The Slack Dam Project No. 8014 as described and designated in Sterling Enterprises, Inc.'s application filed on January 30, 1984, is exempted from all of the requirements of Part I of the Federal Power Act, including licensing, subject to the standard Articles in §4.106, of the Commission's regulations attached hereto as Form E-2, 18 C.F.R. §4.106 45 Fed. Reg. 11658 (March 25, 1985), and the following article.

Article 9. Exemptee shall continue to consult and cooperate with the Vermont State Historic Preservation Officer (SHPO) to protect the Slack Chimney component of the Springfield Historic District. Further, Exemptee shall implement any necessary measures recommended by the SHPO to protect and preserve the historical integrity of the Slack Chimney.

(B) This order is final unless appealed to the Commission by any party within 30 days from the issuance date of this order under 18 C.F.R. 385.1902 (1985).

Kenneth M. Pusateri
Acting Director, Office
of Hydropower Licensing

4/ Environmental Assessment, Slack Dam Project, FERC Project No. 8014-000, Division of Environmental Analysis, Office of Hydropower Licensing, Federal Energy Regulatory Commission, July 17, 1985. This document is available in the Division of Public Information and in the Commission's public file associated with the proceeding.

Appendix B (continued)

P-[illegible] 14-000

UNITED STATES OF AMERICA

FEDERAL ENERGY REGULATORY COMMISSION

Notice of Application Filed with the Commission

[illegible], 1984

Take notice that the following hydroelectric application has been filed with the Federal Energy Regulatory Commission and is available for public inspection:

a. Type of Application: Exemption (less than 5 MW)

b. Project No: 8014-000

c. Date Filed: January 30, 1984

d. Applicant: Sterling Enterprises, Inc.

e. Name of Project: Slack Dam

f. Location: On the Black River in Windsor County, Vermont

g. Filed Pursuant to: Energy Security Act of 1980, [illegible] 408, 16 U.S.C. §§2705 and 2708 as amended.

h. Contact Person: Mr. [illegible], [illegible], Springfield, Vermont 05156

i. Comment Date: [illegible]

j. Competing Application: Project No. [illegible]
Date Filed: [illegible], 1983
Due Date: [illegible], 198[illegible]

k. Description of Project: The run-of-river project would consist of: (1) the existing [illegible]-high and [illegible] [illegible] gravity, Slack Dam with a crest elevation of [illegible] feet [illegible]; (2) a small impoundment with a surface area of [illegible]; (3) an existing intake and [illegible] structure [illegible] and [illegible] at the [illegible] bank [illegible]; (4) an existing [illegible]-diameter and [illegible] steel penstock; (5) an existing powerhouse with [illegible] generating units with a total installed capacity of [illegible] kW and [illegible] switchyard on top of the powerhouse; (7) a new [illegible] transmission line; (8) an existing [illegible] facilities; and (9) other appurtenances. Applicant estimates an average annual generation of [illegible] kWh. Existing facilities are owned by the Applicant.

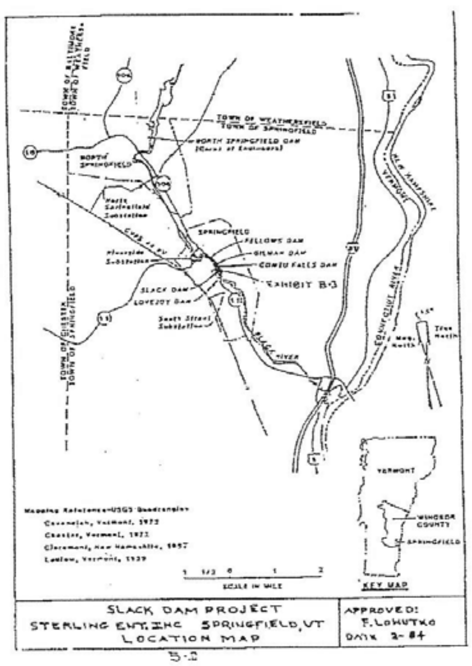
l. Purpose of Project: Project energy would be sold to the Central Vermont Public Corporation.

m. This notice also consists of the following standard paragraphs: A4, B, C, and D1a.

n. Purpose of Exemption: An exemption, if issued, gives the Exemptee priority of control, development, and operation of the project under the terms of the exemption from licensing, and protects the Exemptee from permit or license applicants that would seek to take or develop the project.

D1a. Agency Comments - The U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the State Fish and Game agency(ies) are requested, for the purposes set forth in Section 408 of the Energy Security Act of 1980, to file within 60 days from the date of issuance of this notice appropriate terms and conditions to protect any fish and wildlife resources or to otherwise carry out the provisions of the Fish and Wildlife Coordination Act. General comments concerning the project and its resources are requested; however, specific terms and conditions to be included as a condition of exemption must be clearly identified in the agency letter. If an agency does not file terms and conditions within this time period, that agency will be presumed to have none. Other Federal, State, and local agencies are requested to provide any comments they may have in accordance with their duties and responsibilities. No other formal requests for comments will be made. Comments should be confined to substantive issues relevant to the granting of an exemption. If an agency does not file comments within 60 days from the date of issuance of this notice, it will be presumed to have no comments. One copy of an agency's comments must also be sent to the Applicant's representatives.

Kenneth F. Plumb
Secretary



B-2

Appendix B (continued)

Attachment
B-2 Form

-1-

§ 4.106 Standard terms and conditions of exemption from licensing

Any exemption from licensing granted under this subpart for a small hydroelectric power project is subject to the following standard terms and conditions:

(a) Article 1. The Commission reserves the right to conduct investigations under sections 4(g), 306, 307, and 311 of the Federal Power Act with respect to any acts, complaints, facts, conditions, practices, or other matters related to the construction, operation, or maintenance of the exempt project. If any term or condition of the exemption is violated, the Commission may revoke the exemption, issue a suitable order under section 4(g) of the Federal Power Act, or take appropriate action for enforcement, forfeiture, or penalties under Part III of the Federal Power Act.

(b) Article 2. The construction, operation, and maintenance of the exempt project must comply with any terms and conditions that the United States Fish and Wildlife Service any state fish and wildlife agencies have determined are appropriate to prevent loss of, or damage to, fish or wildlife resources or to otherwise to carry out the purposes of the Fish and Wildlife Coordination Act, as specified in Exhibit E of the application for exemption from licensing or in the comments submitted in response to the notice of the exemption application.

(c) Article 3. The Commission may revoke this exemption if actual construction or any proposed generating facilities has not begun within two years, or has not been completed within four years from the date on which this exemption was granted. If an exemption is revoked under this article, the Commission will not accept from the prior exemption holder a subsequent application for exemption from licensing or a notice of exemption from licensing for the same project within two years of the revocation.

(d) Article 4. This exemption is subject to the navigation servitude of the United States if the project is located on navigable waters of the United States.

(e) Article 5. This exemption does not confer any right to use or occupy any Federal lands that may be necessary for the development or operation of the project. Any right to use or occupy any Federal lands for those purposes must be obtained from the administering Federal land agencies. The Commission may accept a license application by any qualified license applicant and revoke this exemption, if any necessary right to use or occupy Federal lands for those purposes has not been obtained within one year from the date on which this exemption was granted.

Attachment
B-2 Form

-2-

(f) Article 6. In order to best develop, conserve, and utilize in the public interest the water resources of the region, the Commission may require that the exempt facilities be modified in structure or operation or may revoke this exemption.

(g) Article 7. The Commission may revoke this exemption if, in the application process, material discrepancies, inaccuracies, or falsehoods were made by or on behalf of the applicant.

(h) Article 8. Any exempted small hydroelectric power project that utilizes a dam that is more than 33 feet in height above streambed, as defined in 18 CFR 12.31(c) of this chapter, impounds more than 2,000 acre-feet of water, or has a significant or high hazard potential, as defined in 33 CFR Part 222, is subject to the following provisions of 18 CFR Part 12, as it may be amended:

(1) Section 12.4(b)(1)(i) and (ii), (b)(2)(i) and (iii), (b)(iv), and (b)(v);

(2) Section 12.4(c);

(3) Section 12.5;

(4) Subpart C; and

(5) Subpart D.

For the purposes of applying these provisions of 18 CFR Part 12, the exempted project is deemed to be a licensed project development and the owner of the exempted project is deemed to be a licensee.

(i) Before transferring any property interests in the exempt project, the exemption holder must inform the transferee of the terms and conditions of the exemption. Within 30 days of transferring the property interests, the exemption holder must inform the Commission of the identity and address of the transferee.

Appendix C FERC Dam Safety Inspection and Correspondence June-Sept. 2016

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF ENERGY PROJECTS
DIVISION OF DAM SAFETY AND INSPECTIONS
NEW YORK REGIONAL OFFICE
19 West 34th Street - Suite 400
New York, New York 10001

Office No. (212) 273-5900 FAX No. (212) 631-8124

In reply refer to:
P-8014-VT Slack
NATDAM ID # VT83031

Dam Safety Inspection
Follow-up

June 20, 2016

Mathew Rubin
Partner
Springfield Hydroelectric Company
26 State Street
Montpelier, VT 05602

Dear Mr. Rubin:

This letter is in regards to the Dam Safety inspections of the above referenced Project that was conducted on May 25, 2016 by Katy Adnams of this office. We thank you for the assistance and cooperation provided during this inspection. During the inspection, the project structures were observed to be in satisfactory condition and adequately maintained. We note the following items that need to be addressed.

1. Woody vegetation has grown up along the right retaining wall adjacent to the river, which creates the forebay area. The vegetation should be cut back and maintained in a mowed or weed-whacked condition within 15 feet of all project structures.

2. During the inspection, the pond level was briefly lowered long enough to observe the downstream condition of the dam. Two penetrations were observed, which appear to be an old low level outlet and a silt gate. The concrete appeared deteriorated around the low level outlet. Please perform a close up inspection of these two penetrations and document the condition of the bedrock contact at the low level outlet, and the current condition of any gates or bulkheads sealing these openings.

1

Appendix C (continued)

3. On December 9, 2009, FERC accepted an analysis showing that the project was a low hazard project indicating that failure of the dam would not endanger life, health or property. Low hazard projects such as the Slack Dam are exempt from filing an Emergency Action Plan with the FERC. However, pursuant to 18 CFR 12.21 (c), to maintain this exemption, a Licensee must at a minimum, review the upstream and downstream areas for changes that might result in a change in hazard classification and submit a certification letter each year to FERC by December 31, stating that there have or have not been any changes that would affect the project's impacts to life, health or property. These letters have not been received for several years.

Please provide photo documentation that Item #1 has been completed and photo documentation and a written description of conditions observed regarding Item #2 by September 30, 2016. Resume submitting certification letters by December 31, 2016 and continue with annual letters. Additionally, be advised that we may send additional comments that arise as a result of the preparation of the inspection report. If you have any questions, please contact Katy Adnams at (212) 273-5921 or katherine.adnams@ferc.gov.

Sincerely,

John Spain, P.E.
Regional Engineer

Appendix C (continued)

Mathew Rubin

From:	Mathew Rubin
Sent:	Tuesday, September 06, 2016 3:47 PM
To:	'katherine.adnams@ferc.gov'
Cc:	Joanna Bombadil
Subject:	P-8014-VT Slack NATDAM ID # VT83031
Attachments:	FERC letter re Slack Dam June 20, 2016.pdf; wall, before.jpg; wall, after.jpg; looking toward rake, before.jpg; looking toward rake, after.jpg; looking toward river, before.jpg; looking toward river, after, 2.jpg

Dear Katy,

In response to the letter from FERC of June 20, 2016, re Dam Safety inspection at our Slack Dam project (attached):

1. The woody vegetation on the right retaining wall has been cut and removed.
   Before and After photos from 3 locations (total of six photos attached).
   We shall in future be sure to maintain the area in a cleared condition.

Our response to 2. of your letter will follow in a separate email,
not wishing to overload the email capacity.

Mathew Rubin
Partner, Springfield Hydroelectric Co.

3

Appendix C (continued)

Mathew Rubin

From:	Mathew Rubin
Sent:	Tuesday, September 06, 2016 5:13 PM
To:	katherine.adnams@ferc.gov
Cc:	Joanna Bombadil
Subject:	FW: P-8014-VT Slack NATDAM ID # VT83031
Attachments:	upstream #2.jpg; upper outlet, side.jpg; full upper outlet.jpg

Dear Katy,

In response to the letter from FERC of June 20, 2016, re Dam Safety inspection at our Slack Dam project:

2a. We have performed close up inspections of the upper gate penetrations visible on the downstream face of the dam.
Three photos, taken from downstream, of the upper gate are attached.
The gate, such as it is, has not been opened or even touched for 30 years. We are reluctant to do so, but will have
the divers who will inspect the racks next summer take a close underwater look.
We would not be adverse to sealing the opening if a good way could be found.

Our response to 2b. of your letter will follow in a separate email,
not wishing to overload the email capacity.

Mathew Rubin
Partner, Springfield Hydroelectric Co.

4

Appendix C (continued)

Mathew Rubin

From:	Mathew Rubin
Sent:	Tuesday, September 06, 2016 5:35 PM
To:	katherine.adnams@ferc.gov
Cc:	Joanna Bombadil
Subject:	FW: P-8014-VT Slack NATDAM ID # VT83031
Attachments:	lower passage.jpg; passage.jpg; upper far end.jpg; dam face.jpg; left pocket.jpg; left pocket closeup.jpg; right pocket.jpg; right pocket closeup.jpg

Dear Katy,

In response to the letter from FERC of June 20, 2016, re Dam Safety inspection at our Slack Dam project:

2b. We have performed close up inspections of the lower gate penetration visible on the downstream face of the dam.

Eight photos, taken from downstream, of the lower gate are attached.

There appears to be solid bedrock contact at the bottom of the gate, with no indication of seepage into the tunnel.

The gate, such as it is, has not been opened or even touched for 30 years. Our expectation is that it is covered in silt, but will have

the divers who will inspect the racks next summer take a close underwater look if possible.

We would not be adverse to sealing the opening if a good way could be found.

Similarly, we would patch the pockets at the upper corners of the outlet, but worry that the patch would break off in the next freeze/thaw cycle.

Our response to 3. of your letter will follow in a separate email,
not wishing to overload the email capacity.

Mathew Rubin
Partner, Springfield Hydroelectric Co.

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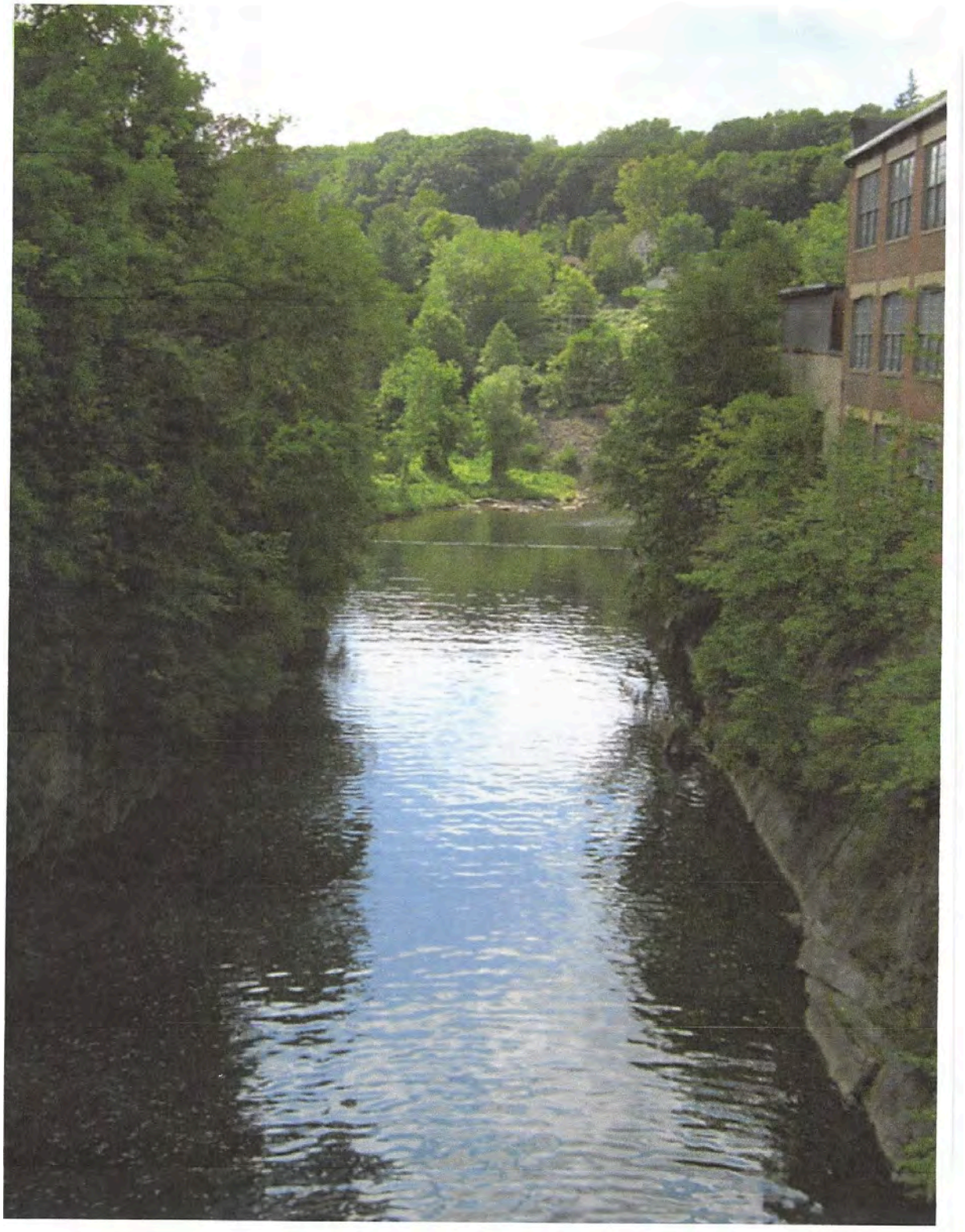
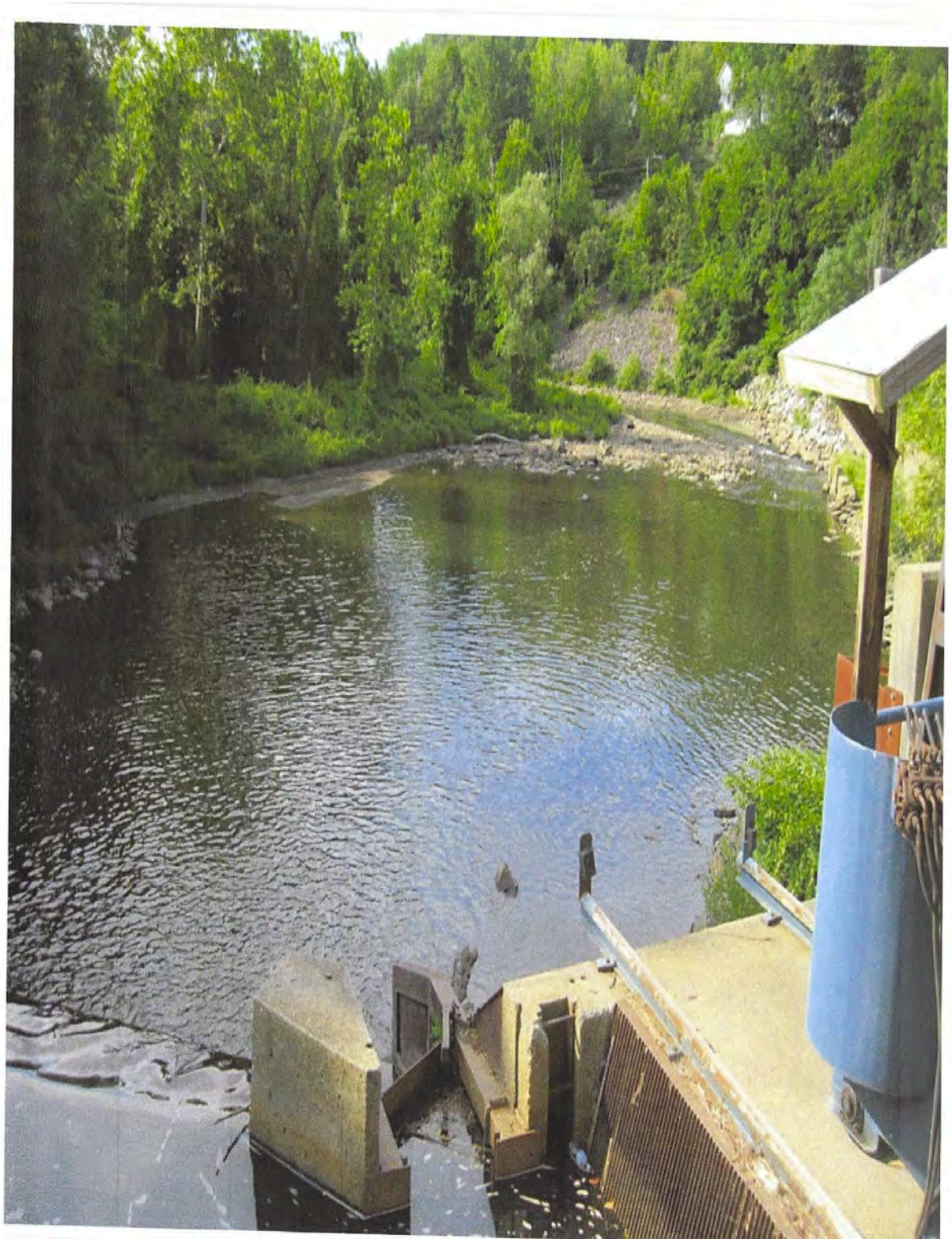
Appendix C (continued)

View of Impoundment



Appendix C (continued)

View to Downstream



Appendix C (continued)

Mathew Rubin

From:	Mathew Rubin
Sent:	Tuesday, September 06, 2016 5:44 PM
To:	katherine.adnams@ferc.gov
Cc:	Joanna Bombadil
Subject:	FW: P-8014-VT Slack NATDAM ID # VT83031
Attachments:	upstream pond from bridge.jpg; downstream .jpg

Dear Katy,

In response to the letter from FERC of June 20, 2016, re Dam Safety inspection at our Slack Dam project:

Kindly consider this letter our certification that there have been no changes either upstream or downstream of the project which
would result in a change of the Low Hazard classification of the project.
Two attached photos taken last month show that there have not been any changes that would affect the project's impacts to life, health or property.

We look forward to submitting annual reports to you hereafter.
Cordially,

Mathew Rubin
Partner, Springfield Hydroelectric Co.

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Appendix C (continued)

Mathew Rubin

From: Mathew Rubin
Sent: Wednesday, September 07, 2016 10:44 AM
To: Katherine Adnams
Cc: Joanna Bombadil
Subject: RE: P-8014-VT Slack NATDAM ID # VT83031

Katy,

Your thoughtful and informative letter is much appreciated.
My recollection is that the upper gate is timber, 2" thick with bolts top to bottom.
After underwater inspection next summer we should know enough to plan for repairs.
Thanks,

Mathew

From: Katherine Adnams [mailto:Katherine.Adnams@ferc.gov]
Sent: Wednesday, September 07, 2016 8:17 AM
To: Mathew Rubin
Cc: Joanna Bombadil
Subject: RE: P-8014-VT Slack NATDAM ID # VT83031

Thanks Mathew!

I would recommend talking to a structural engineer regarding possible sealing options and repair to the pockets. You are right that just patchwork would be subject to further deterioration from freeze/thaw. Typically, the more successful repair work involves chipping away any deteriorated concrete from the area (typically this is 6 to 12 inches in thickness, although it really depends a lot on the quality of concrete originally placed), drilling and epoxying dowels into the sound concrete, and using appropriate rebar in the patch area to tie to the dowels. A coating is placed on the concrete prior to new concrete placement that helps with adhering the new concrete to the old, and then an air entrained concrete suitable for wet environments is used for the patch. A similar process can be used to seal the gate tunnels, with a bulkhead designed to structurally withstand the water pressure (for that future day when the gate no longer does its job) tied into the existing concrete with dowels. A tube is placed through the formwork for injecting grout to complete the filling of the tunnel after the concrete bulkhead has cured. These type of repairs would require a prolonged drawdown (maybe a month or two for this small of a project) so appropriate notifications and permits would be required from the state. We would also want to review plans for sealing of the gates. The pocket repairs are more a maintenance item, similar drawdown may be required, but not something we need to review unless you decide to do the work all at once (which would make sense) then we'd review the plans for all work.

These repairs don't appear to be necessary in the immediate timeframe, but something you might want to consider over the next five years.

Please confirm that the upper gate is a timber gate?

Thanks,
Katy

Katherine E. Adnams, P.E.
Division of Dam Safety Inspections

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Appendix D Water Quality Certification, P.L. 92-500, Section 401 Issued Jan 31, 1985

WATER QUALITY CERTIFICATION
(P.L. 92-500)

In the matter of: Sterling Enterprises, Inc.
24 Mineral Street
Springfield, VT 05156
Application for Slack Dam
Hydroelectric Project

By letter dated May 31, 1984, Mr. Floryan Lohutko, President, Sterling Enterprises, Inc. (the applicant) requested a Water Quality Certification from the Vermont Department of Water Resources and Environmental Engineering (the Department). Because the submission was considered inadequate, and the Department asked for additional information by letter dated June 13, 1984. On June 27, 1984, the applicant forwarded a copy of the Federal Energy Regulatory Commission Exemption Application (December, 1983) and a deficiencies response (June 22, 1984). The Department has reviewed this material and has made the following findings:

1. The applicant proposes to develop Slack Dam located on the Black River in the Village of Springfield. The dam is 4 1/4 miles upstream of the Black River's confluence with the Connecticut River. It is one of a series of five remaining dams on the Black River in the village area:

Dam	River Mile	Crest Elevation
Lovejoy Dam	4.04	343.6' NGVD
Slack Dam	4.26	364.5' NGVD
Comtu Falls Dam	4.36	392.8' NGVD
Gilman Dam (Factory Falls)	4.46	424.2' NGVD
Fellows Dam	4.70	435.5' NGVD

-1-

Appendix D (continued)

The dam was rebuilt in the 1930's and was a portion of the J.T. Slack Company Shoddy Mill complex. The dam is a gravity concrete structure with a crest length of about 92 feet and a height of 30 feet. It forms an impoundment with a surface area of about 0.9 acre and a volume of 10 acre-feet. The pool extends about 420 feet upstream to Comtu Falls, establishing the tailwater condition for the operating hydroelectric plant at Comtu Falls Dam.

2. The existing intake is located on the right (southwest) bank about 72 feet upstream of the dam. The masonry structure would divert water to two new steel penstocks, 112 feet long and three feet and five feet in diameter. A 250 kw and a 150 kw packaged bulb-type turbine/generator unit are to be installed, with the draft tubes discharging into a tailrace located about 80 feet downstream of the dam. The discharge is into the Lovejoy Dam pool, providing a gross head of 19.6 feet (normal pool levels of 364.1' NGVD and 344.5' NGVD).

3. The project will be "run in a semi-automatic mode with sensing devices signaling an automatic cut-off to the gate valve and turbine system..." (June 27, 1984 letter). The hydraulic (flow) capacity of the two units has not been provided. Using the power equation and a net available head of 19 feet, the capacities may be estimated at 184 cfs (250 kw unit) and 110 cfs (150 kw). The low end capacities are 118 cfs and 63 cfs, respectively.

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Appendix D (continued)

4. The drainage area at the site is 190 square miles. A USGS surface water gaging station (#01153000) is located on the Black River 800 feet downstream of the North Springfield Flood Control Reservoir and has been in continuous operation since 1929. The drainage area at the gage is 158 square miles. Based on a simple drainage area proration, the following hydrologic values have been estimated for the site:

Parameter	Value (cfs)
Mean Flow	350 (24.9 inches/year)
50% Exceedance (Median)	165
95% Exceedance	35
7Q10	21

5. The Water Resources Board has designated the Black River from North Springfield Dam to the Connecticut River as Class C waters. Class C waters are suitable for recreational boating; irrigation of crops not used for consumption without cooking; habitat for wildlife and for common food and game fish indigenous to the region; and such industrial uses as are consistent with other Class uses. For the protection and management of aquatic life, the stream has been designated as Water Management Type I or II, setting the absolute minimum dissolved oxygen (D.O.) concentration at 6 mg/l. Type II streams are managed for mixed populations of rainbow trout, brown trout and smallmouth bass.

6. Seasonal high water temperatures limit the quality of the salmonid fishery in this river; however, a private 1978 fish population survey found that brown trout inhabit the Lovejoy Dam

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Appendix D (continued)

pool. Also, the Vermont Department of Fish and Wildlife stocks rainbow and brown trout. Smallmouth bass and several other fish species were also sampled in 1978.

7. The applicant states that the operation will be run-of-the-river and that at least 0.5 inch of water will be spilled over the dam crest at all times. This corresponds to a minimum spillage of about 2-3 cfs. In the June 27, 1984 letter, the applicant states that the Lovejoy Dam backwater extends to Slack Dam; however, the Vermont Department of Fish and Wildlife District Fisheries Biologist indicates that a small riffle separates the plunge pool and the Lovejoy impoundment during low flows.

The U.S. Fish and Wildlife Service has recommended the passage of a minimum flow of 58 cfs based on their Flow Recommendation Policy for the New England Area. This policy prescribes minimum flows necessary for the perpetuation of indigenous aquatic organisms, using historical base flows during critical, seasonal periods. A flow of 58 cfs is the estimated August median flow for the Black River.

8. Limited water quality data is available at this time and no special studies have been conducted to predict, with any reasonably degree of certainty, what the development of the Springfield dam sites will mean in terms of future water quality in the Black River. It is important that the dissolved oxygen content of the river downstream of Springfield be sufficient to assimilate effluent from the municipal sewage treatment plant.

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Appendix D (continued)

Lower D.O. levels caused by loss of reaeration at the dams would further limit the waste discharge and/or cause Water Quality Standards violations.

The applicant has submitted the results of five sets of grab samples collected in July/August, 1983. Unfortunately, the samples were collected well after the critical diurnal period for algae respiration (just before day break). The data does suggest that D.O. levels are influenced by respiration.

Without the completion of a detailed water quality study, the Department cannot accept the proposal to provide aeration for only 2-3 cfs. The Department will, therefore, require an interim minimum spillage of 48 cfs, which is the required minimum flow from the proposed North Springfield Project. This minimum flow shall be in force until such time as the applicant demonstrates to the satisfaction of the Department that the project will not significantly reduce D.O. concentrations.

9. If the project is operated strictly run-of-the-river, the downstream flow regime will be unaffected, minimizing the fishery impact of the project. A spillage of 48 cfs will be adequate to maintain the plunge pool fishery.

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Appendix D (continued)

CONDITIONS

The Department certifies that this project will meet Vermont Quality Standards with the following conditions:

A. The project shall be operated as a strict run-of-the-river facility with instantaneous flows below the tailrace maintained equivalent to instantaneous inflows. No flashboards shall be installed across the dam crest.

B. When the project is not operating, all flows shall be spilled over the dam crest.

C. The project shall spill a continuous minimum flow of 48 cfs, or instantaneous project inflow, if less, over the dam crest. It is noted that the project will not be operational when flows are less than 63 cfs, the low end of the smaller turbine, plus the minimum spillage requirement of 48 cfs. The applicant shall provide the Department with a specific plan, including hydraulic calculations, showing how the 48 cfs will be passed.

D. The pool shall not be drawn down below the dam crest without special written permission from the Department. Any future desilting of the impoundment shall be done in accordance with the Agency of Environmental Conservation Desilting Policy, a copy of which is attached.

E. The applicant shall not discharge petro chemicals, wet concrete, or debris to State waters during construction or operation of the facility. Any debris removed at the intake structure shall be disposed of properly.

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Appendix D (continued)

F. The applicant shall file a comprehensive erosion and sediment control plan with the Department. The plan shall cover temporary and permanent measures to be taken during and following construction to control turbidity and sedimentation in the Black River.

G. Any significant changes to the project must be submitted to the Department for review and approval.

H. No construction may commence until the Department has issued written approval for Conditions C and F. Operational changes made after project completion are subject to Condition G and must be approved prior to effecting the change.

I. The applicant shall provide the Department of Water Resources and Environmental Engineering with an as-built set of plans for the record.

John R. Ponsetto, Commissioner
Department of Water Resources
and Environmental Engineering

Dated at Montpelier, Vermont
this 31st day of January, 1985.

JRC/rh

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Appendix E Water Quality Certification (P.L. 92-500, Section 401) Amendment Issued March, 1985

WATER QUALITY CERTIFICATION AMENDMENT
(P.L. 92-500, Section 401)

ORIGINAL

In the matter of: Sterling Enterprises, Inc.
24 Mineral Street
Springfield, Vermont 05156
Application to Amend Slack Dam
Hydroelectric Project Water
Quality Certification

By letters dated November 15 and November 18, 1985, Sterling Enterprises, Inc. (the applicant) requested that the Department of Water Resources and Environmental Engineering (the Department) amend the Water Quality Certification for Slack Dam Hydroelectric Project to reduce the minimum spillage requirement and change the head and elevation values in the document. The Department finds that:

1. On January 31, 1985, the Department certified the Slack Dam Hydroelectric Project. Subsequently, during July and August, 1985, another firm interested in developing hydroelectric projects in Springfield completed a summer water quality sampling program on the Black River. The Department has reviewed the results of this study in the context of whether or not Water Quality Standards would be met if Slack Dam reduced spillage below the requirements in Condition C of the Certification.

2. The Vermont Water Resources Board has classified the Black River in Springfield as Class C waters. Class C waters are managed to provide habitat suitable for aquatic biota, fish and wildlife and for uses including recreational boating and any recreational or other water uses in which contact with the water is minimal and where ingestion of the water is not probable; irrigation of crops not used for human consumption without cooking; and compatible industrial uses.

Appendix E (continued)

The river in the reach is designated as a coldwater fish habitat. The dissolved oxygen minimum standard is 6 mg/l or 70 percent saturation at all times. Higher standards apply to areas which the Secretary of the Agency of Environmental Conservation determines are salmonid spawning or nursery areas important to the establishment or maintenance of the fishery resources.

3. During July and August, 1985, Westinghouse Electric Corporation conducted a water quality sampling program to determine present river temperature/dissolved oxygen levels during the critical summer low flow periods. Five sampling stations were included in the study, the furthest upstream being above Fellows Dam and the furthest downstream being below Lovejoy Dam. Both midday and early morning samples were collected. Flow data for the site was not collected. Gage records for North Springfield were obtained, and approximate flows for the study are estimated.

On each of the sampling dates, the percent saturation of the early morning sample exceeded 80% at the uppermost station. All samples were at or near saturation leaving the project area. The lowest recorded upstream dissolved oxygen concentration was 7.2 mg/l on July 11 at about 5 A.M. Limited sampling in 1983 included a dissolved oxygen of 6.4 mg/l (77% saturation) on August 4 at 9 A.M.

In order to assure that the development of hydroelectric projects in Springfield does not conflict with the operation of the municipal wastewater treatment plant below the village, it is desirable to maintain dissolved oxygen levels downstream of

Appendix E (continued)

Lovejoy Dam at or near saturation. Based on the data provided to date, it appears that the proposed hydroelectric facilities if operated as proposed will not reduce the river's ability to assimilate sanitary wastes.

4. The four other hydroelectric sites on the Black in Springfield are being certified conditional upon the spillage of a minimum of 0.5 inch of water over the dam; strict run-of-the-river operation; and a follow-up study of project impact on water quality. The Slack Dam Project is certified to operate in a strict run-of-the-river mode. The Department believes that Water Quality Standards for dissolved oxygen will be met if all projects operate strictly run-of-the-river and spill 0.5 inch of water over the full length of the dam crest continuously.

5. The spillage rate at 0.5 inch of depth over the crest is about 3 cfs. The applicant has estimated that the plunge pool bypassed by the project has a volume of about 20,000 cubic feet. The pool would be fully changed about once every two hours with the 0.5 inch spillage. This should be sufficient to keep the pool fresh and preserve the fishery.

6. In order to confirm the project's conformance with standards, a follow up study of the dissolved oxygen levels during project operation will be required as a condition of this certification. If standards for dissolved oxygen are not being met or will not be met when the project is being operated as certified, the Department may order further mitigation including but not limited to additional spillage.

Appendix E (continued)

7. The gross head at the project has increased from 19.6 feet to 20.9 feet. The normal pool level has increased from 364.1' NGVD to 364.5'NGVD, and the tailwater level decreased form 344.5' NGVD to 343.6' NGVD. These changes are based on a better survey and do not represent changes to the project design.

8. The applicant has stated that the Lovejoy Dam pool extends up to Slack Dam. If this is the case, fish will be capable of moving between pools and the 3 cfs of spillage would not prevent fish movement. If the Department finds after start of project operation that the headrace penstock bypass of the plunge pool creates a shallow riffle upstream of the tailrace and prevents fish movement, the Department may order an increase in spillage to accommodate fish movement.

9. No plan has been presented to provide for the safe passage of fish downstream at the dam. This certification is being conditioned to require the development and implementation of a plan which will 1) prevent or minimize the passage of fish through the turbine unit, if significant injury or mortality can result; 2) prevent or minimize impingement of fish on screens, trashracks, or other such devices; and 3) convey fish safely and efficiently downstream past the dam.

Appendix E (continued)

CONDITIONS

Based on its review and findings, the Department hereby amends the Slack Dam Hydroelectric Project Water Quality Certification by rewording Condition C and adding Conditions J, K, and L:

C. The project shall spill a continuous minimum flow equivalent to a minimum of 0.5 inch of water depth over the full length of the dam crest. An automatic level sensor shall be installed to insure that this condition is met.

J. During the first summer of operation, the applicant shall conduct a water quality study to determine the effect the project has on dissolved oxygen levels in the river. Prior to undertaking the sampling, the applicant shall submit a plan of study to the Department for review and approval before June 1 of that year. The study results shall be filed with the Department by the end of that year.

K. The applicant shall submit a plan for downstream fish passage to the Department of Fish and Wildlife for approval prior to project construction. This plan shall include the design of the screens, trashracks or other such devices and the means for providing downstream passage of fish at the dam. The project shall not be operated without the approved passage plan in place. The applicant shall file a copy of the approval letter and approved plan with the Department within two weeks of the Department of Fish and Wildlife's action.

Appendix E (continued)

-6-

L. No construction may commence until after the Department has issued written approval under Condition D.

Jonathan Lash

Jonathan Lash, Commissioner
Department of Water Resources
and Environmental Engineering

JRC/djc
3-86

Appendix F ANR Compliance Letter Jan, 2011 LIHI Correspondence June, 2011

Link to LIHI CERT 78:
http://lowimpacthydro.org/wp-content/uploads/2011/10/WQC-jan-2011-update062.pdf

From: "John Warshow" <jwarshow@sover.net>
Subject: **FW: LIHI Certification - Winooski-8 and Slack Dam**
Date: January 10, 2011 10:59:08 AM EST
To: "'Fred Ayer'" <fayer@lowimpacthydro.org>
Cc: "'Mathew Rubin'" <mrubin@sover.net>

John Warshow

From: Fitzgerald, Brian [mailto:Brian.Fitzgerald@state.vt.us]
Sent: Monday, January 10, 2011 10:22 AM
To: John Warshow (jwarshow@smdhydro.com)
Cc: Kim, Rich; McMenemy, Jay
Subject: LIHI Certification - Winooski-8 and Slack Dam

John,

You called recently and indicated that you are applying for Low Impact Hydropower Institute certification for the Winooski-8 and Slack Dam projects. You requested that the Agency document compliance with the projects' water quality certifications and whether the projects are located on impaired waters, i.e., the state 303(d) list.

Winooski-8: This project is operating under a water quality certification issued on Dec. 29, 1982 and amended on April 5, 1984. Generally, the project operates in compliance with the conditions of the certification. This reach of the Winooski River is not listed on the most recent (2008) list of impaired waters.

Slack Dam: This project is operating under a water quality certification issued on Jan. 31, 1985 and amended on March 10, 1986. Generally, the project operates in compliance with the conditions of the certification. This reach of the Black River is not listed on the most recent (2008) list of impaired waters.

Please let me know if you need additional information.

BT

Brian T. Fitzgerald
Vermont Agency of Natural Resources
Department of Environmental Conservation
Water Quality Division
103 South Main Street, 10 North
Waterbury, VT 05671-0408

802.241.3468
802.793.0454 (cell)
brian.fitzgerald@state.vt.us
http://www.vtwaterquality.org
Conservation is a cause that has no end. There is no point at which we will say our work is finished.
- Rachel Carson

Please consider the environment before printing this e-mail

Appendix F (continued)

RECORD OF CONTACTS

Date of Conversation:	6/13/2011
Application Reviewer:	Jackie Dingfelder, Consultant
Person Contacted:	Brian Fitzgerald, Vermont Dept. of Environmental Conservation
Telephone/email:	802.241.3468/
Areas of Expertise:	Streamflow Protection Coordinator

Jackie,

Thanks for your voicemail and email.

Compliance with water quality certification conditions at both projects includes meeting flow requirements, so both projects are in compliance with respect to flows.

For comments specifically on fisheries impacts, you should contact the appropriate district fisheries biologist in the Vt. Department of Fish and Wildlife:

Slack Dam: Jay McMenemy, or 802.885.8829
Winooski-8: Rich Kirn, or 802.485.7566

Please let me know if you need additional information.

BT

Brian T. Fitzgerald
Streamflow Protection Coordinator

Vermont Agency of Natural Resources
Department of Environmental Conservation
Water Quality Division
103 South Main Street, 10 North
Waterbury, VT 05671-0408

802.241.3468
802.793.0454 (cell)

Date of Conversation:	8/26/2011
Application Reviewer:	Jackie Dingfelder, Consultant
Person Contacted:	Brian Fitzgerald, Vermont Dept. of Environmental Conservation
Telephone/email:	802.241.3468/

Appendix G1 Letter to Melissa Grader Dec, 2011

SPRINGFIELD HYDROELECTRIC COMPANY
26 STATE STREET
MONTPEIER, VERMONT
05602

Mellissa Grader US F&W
Curt Orvis US F&W
Rod Wentworth VT F&W
Fred Ayer LIHI

December 12, 2011

Re: Slack Dam downstream fish passage
FERC Exemption No. 8014

Slack Dam was recently certified as a low-impact facility by LIHI.

A condition of the certification is a requirement to re-engage with you and attempt to resolve the issue of the adequacy of the downstream passage.

While we are of the opinion that the current configuration is appropriately protective, we are currently undertaking a hydrologic analysis of the river in order to determine what percent of the time the fishway is in service each year that the flows are too high or too low to have an impact on the downstream migration. Our expectation is that the study will show that flows are too high for most of the spring and therefore most of the fish go over the dam, and that flows in the fall are mostly too low to cause turbulence at the entrance sufficient to harm the young salmon. We should have this information to you in January for your consideration

Should the hydrologic study results demonstrate that the downstream passage to be inadequately protective, we would propose to proceed with field testing next summer using at least 100 live fish as recommended by Curt in his memo of December 5, 2008.

In case you have not heard, Winooski One had another record run of salmon this fall. I will send you some information on that separately.

John Warshow

Appendix G1

Cc LIHI

Appendix G2 Letter from J.Warshow to M.Grader Feb, 2012

John Warshow

From: John Warshow [jwarshow@sover.net]
Sent: Monday, February 06, 2012 4:47 PM
To: 'Melissa_Grader@fws.gov'; 'Curtis_Orvis@fws.gov'; 'rod.wentworth@state.vt.us'
Cc: 'Fred Ayer'
Subject: FW:
Attachments: SLACK FLOWS.xlsx

RE; Slack Dam, Springfield VT
Downstream Fish Passage

With reference to my emailed letter dated December 12, 2011, attached please find our analysis of flows on the Black River during spring and fall spawning time.
The analysis shows that depending on the month, between 80-96% of the time during the spawning seasons, flows are either too high or too low to have the potential to create circumstances that would damage the gills of the downstream migrants as set forth bellow:

We obtained mean daily flow data for all days of record form the USGS, 1929-1989, 60 years.
The data was then modified to reflect the smaller drainage area at the gauge at N. Springfield, 158 sq miles versus 190 sq miles at Slack Dam.
The data for each month was than sorted and ranked from 100% to 0% exceedance as seen on the attached spread sheet to derive exceedance values.

We made the following assumptions based on observed turbulence at different power levels:

1) Flows below 236 cfs/s do not cause excessive turbulence at the fishway entrance.
2) Flows above 356 cfs/s result in 4" inches or more going over the dam and therefore fish are being swept over the dam as flows increase.

Flows in April are in the 230-356 cfs/s range 5% of the time, 99-94% exceedance.
Flows in May are in the 230-356 cfs/s range 20% of the time, 78-58 % exceedance.

Flows in September are in the 230-356 cfs/s range only 4% of the time, 9-5 % exceedance
Flows in October are in the 230-356 cfs/s range only 9% of the time, 20-11% exceedance.

Not withstanding the foregoing, we have reviewed the correspondence in our files and and believe we can make some modest adjustments to the mouth of the fishway this summer to increase flow and reduce turbulence. Essentially we would cut off the 90 degree angels created by the vertical structural square tubing and stop log slots at the entrance and replace the square tubing with rounded corners in a bell mouth fashion and move the stop log slots slightly down stream and have them recessed instead of restricting flows and causing turbulence as is the current situation. We can prepare a drawing for clarification if you wish.

We look forward to hearing from you.

John Warshow

Appendix G2

Appendix G3 Letter from R. Wentworth to J. Warshow May, 2014

John Warshow

From: John Warshow [jwarshow@sover.net]
Sent: Wednesday, May 14, 2014 4:50 PM
To: 'Wentworth, Rod'
Subject: RE: Atlantic Salmon Restoration Project Black River, VT

Thanks Rod

Yes, Ray Ingram still does it, Will Colgan helps out

We will keep the downstream passage working as long as there are fish migrating downstream

John Warshow

From: Wentworth, Rod [mailto:rod.wentworth@state.vt.us]
Sent: Wednesday, May 14, 2014 4:00 PM
To: 'John Warshow'
Cc: Will, Lael; Crocker, Jeff; Davis, Eric
Subject: RE: Atlantic Salmon Restoration Project Black River, VT

John, I thought the Fiddlehead slalom hadn't been done now for years. Has it continued as an annual event? Is Ray still organizing it?

The USFWS, for a variety of reasons, recently ended its involvement in the salmon program. The last year of fry stocking was in 2013. Since these fish will move downstream after 1-3 years, downstream passage for stocked salmon smolts remains effective through 2016. Please do not assume that fish passage is no longer required as that is not the case.

Although fish passage at hydroelectric facilities has historically and more recently aimed to provide passage for diadromous species such as Atlantic salmon, American shad, American eel and River herring, riverine species have also benefitted. It is likely that maintaining passage from April 1 through June 15 and from September 15 through November 15 each year would accommodate passage needs for fish species such as trout that have the propensity to migrate during the spring and fall for various life cycle purposes. In order to provide, protect, and restore natural upstream and downstream movement of migratory and resident fish past hydroelectric projects to access river reaches and tributaries with suitable areas of habitat for the establishment of healthy fish populations, the Agency is in the process of developing criteria to determine when passage is warranted. Therefore, you must continue to provide downstream fish passage through at least 2016, and expect to hear from us before then about long term fish passage needs.

While the USFWS will no longer culture Atlantic salmon for restoration efforts in the Connecticut River Basin, the Connecticut River Atlantic Salmon Commission (CRASC) partners have recognized the value of returning salmon, including natural reproduction in natural habitat. Based on that, upstream fish passage facilities will continue to operate, in some cases subject to triggers based on the number of fish. Because natural reproduction capabilities and survival to emergence are unknown at this time, CRASC partners have only identified upstream fish passage plans for the 2014 season. Planning is still underway regarding the program's future direction and the need to provide passage in the coming years.

Rod Wentworth • VT Dept. of Fish & Wildlife

Appendix G3

7/21/2014

Appendix G3 (continued)

1 National Life Drive, Davis 2, Montpelier VT 05620-3702
Office/cell: (802) 595-5179 • Email: rod.wentworth@state.vt.us
Vermont: *Respect. Protect. Enjoy*
Visit our website for Family fishing tips • VT fish photos • Aquatic habitat

From: John Warshow [mailto:jwarshow@sover.net]
Sent: Wednesday, May 14, 2014 3:36 PM
To: Wentworth, Rod
Subject: Atlantic Salmon Restoration Project Black River, VT

Hi Rod,

Did you make it to the Fiddlehead Slalom?
Good turn out, 20+ years now.

I was wondering what the status of the Connecticut River Salmon Restoration Program is.
Last we heard the US F&W Service had given up and the White River hatchery was wiped out by Irene.
We likely will need to invest some money in the downstream passage at Slack dam in Springfield this year if the program is continuing.

Let me know, thanks!

John Warshow

7/21/2014

Appendix G4 Letter from D. Hall to J.Warshow July, 2014

LOW IMPACT HYDROPOWER INSTITUTE

PO BOX 194 HARRINGTON PARK, NEW JERSEY 07640

www.lowimpacthydro.org

July 11, 2014

John L. Warshow
Springfield Hydroelectric Company
26 State Street
Montpelier VT 05602

Subject: **Slack Dam Hydroelectric Project - LIHI Certificate No. 00078**
Annual Compliance

Dear Mr. Warshow:

Our records show that the annual compliance statement required to maintain your LIHI certification is now due. Please fill out and sign the enclosed compliance statement and return to me at your earliest convenience by US mail or by a digital scan via email to dhall@lowimpacthydro.org.

Further, please note that as non-standard conditions of certification, outlined in your Certificate Narrative dated October 27, 2011, you are obliged to document adherence to the following, which requires additional enclosures:

· Upon receipt of certification, Springfield Hydroelectric Company ("Springfield") must initiate consultation with the USFWS and the Vermont Department of Fish and Wildlife Department (collectively, the agencies) to determine whether the current downstream passage at its project is appropriately protective, and to report to LIHI by **March 1, 2012** as to whether the agencies have deemed it appropriately protective. If the agencies determine that it is not appropriately protective, Springfield shall provide proof that an agreement has been reached with the agencies providing for either fishway modifications or downstream passage effectiveness testing by Springfield in 2012.

· If downstream effectiveness testing is required, Springfield shall report to LIHI by **November 1, 2012** on the results of the testing unless a different date is mutually agreed upon by Springfield and the agencies.

· If results do not show adequate effectiveness to be appropriately protective, Springfield shall also report to LIHI as to whether agreement has been reached on fishway modifications that will be implemented and operational by **April 1, 2013**.

Appendix G4

Appendix G4 (continued)

· LIHI reserves the right to suspend certification if the above steps are not completed, if no agreement is reached with the agencies, or if required measures to ensure downstream passage is appropriately protective of the Atlantic salmon resource are not made by April 1, 2013.

Since we transitioned our offices from Maine to New Jersey, I cannot find any record that you submitted reports to LIHI pertaining to these conditions. Can you please provide an update on the status of this condition with your compliance statement?

If you are unable to sign the compliance statement because of changed circumstances or other events, please contact me either by telephone or e-mail.

Sincerely,

Dana A. Hall, Deputy Director
Low Impact Hydropower Institute

Appendix G5 Letter from J.Warshow to D.Hall July, 2014.

Springfield Hydroelectric Company
26 State Street
Montpelier, Vermont 05602
(802) 223-7141
FAX (802) 229-4666

Memo

To Dana A Hall, Deputy Director
Low Impact Hydro Institute

From John Warshow

Re: Downstream Fish Passage
Your letter of July 11th
Slack Dam, Black River Springfield, VT

Date July 25,2014

Dana,
Since the project went into operation in 1987 we have had downstream fish passage, beginning with plans drawn up by Ben Rizzo, USF&W January 6, 1987.

Since that time we have made the following changes at the request of the USF&W and VF&W.

Shut off original pipe passage and replaced it with a chute cut into the dam.
Extended the chute.
Closed off the chute.
Installed a new sluice and slide.

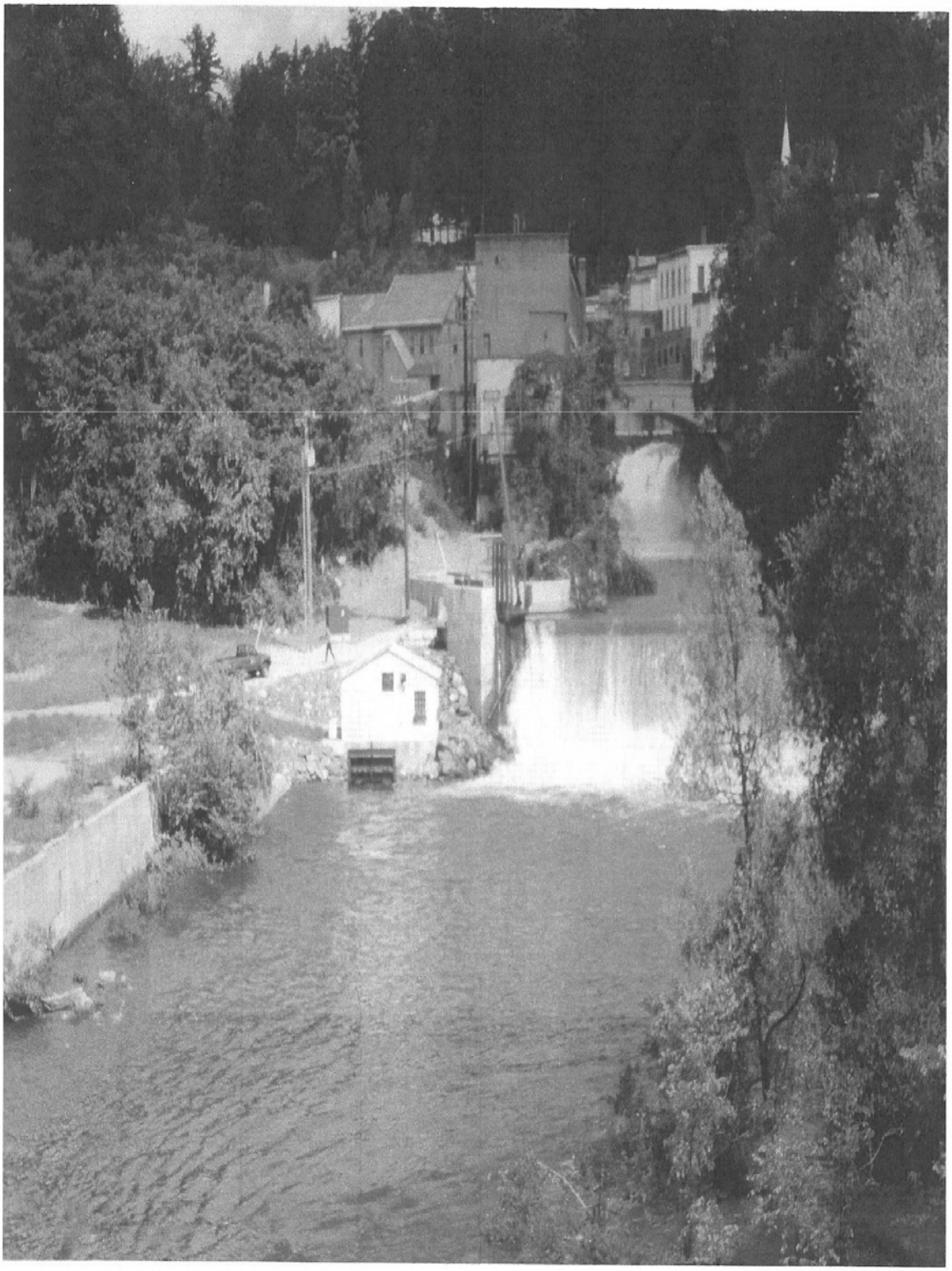
Upon inspection of the sluice and slide in 2011 concerns about turbulence at the sluice entrance under very limited conditions. Photographs of those flow conditions together with the results of a hydraulic study which is attached, demonstrate that the facility as constructed and operated is appropriately protective of this resource. Copies of the study as well as pertinent correspondence is attached (Please note LIHI was cc'd on all of it). There were also several verbal communications with Fred Ayer about the situation at that time.

As you may be aware, the USF&WS has announced that the Connecticut River Salmon Restoration Project is being terminated. We have been advised by VF&W that after the fall 2016 run there will be no longer be any salmon migrating downstream. Also, please be aware that there is no upstream passage on the Black River, there never has been; these fish are purely for the purpose of diluting the number of salmon that go to the ocean to grow so that predators will not kill as many of the returning adults.

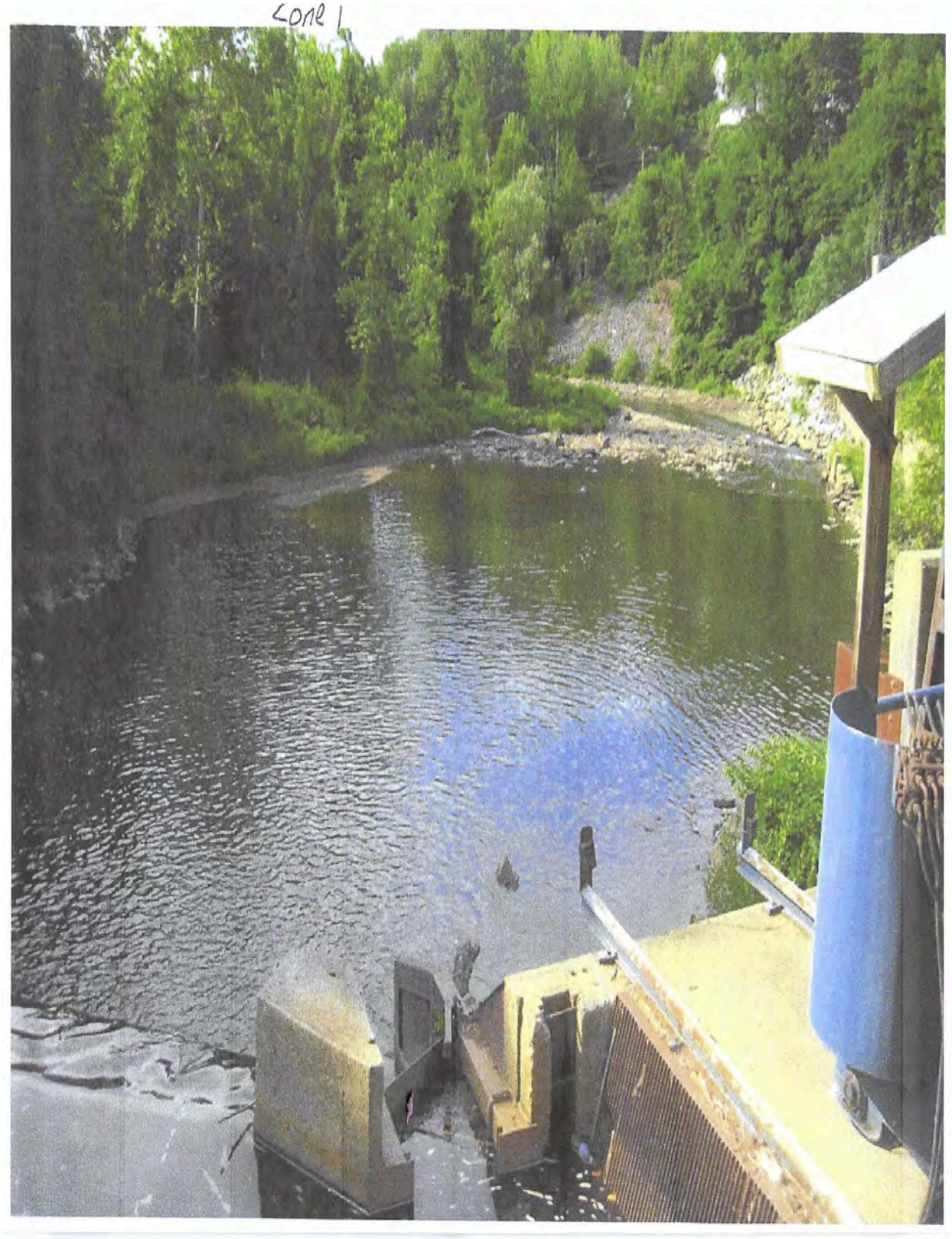
From our perspective, absent any communication or documentation to the contrary, the passage facility currently in place is appropriately protective.

Appendix G5

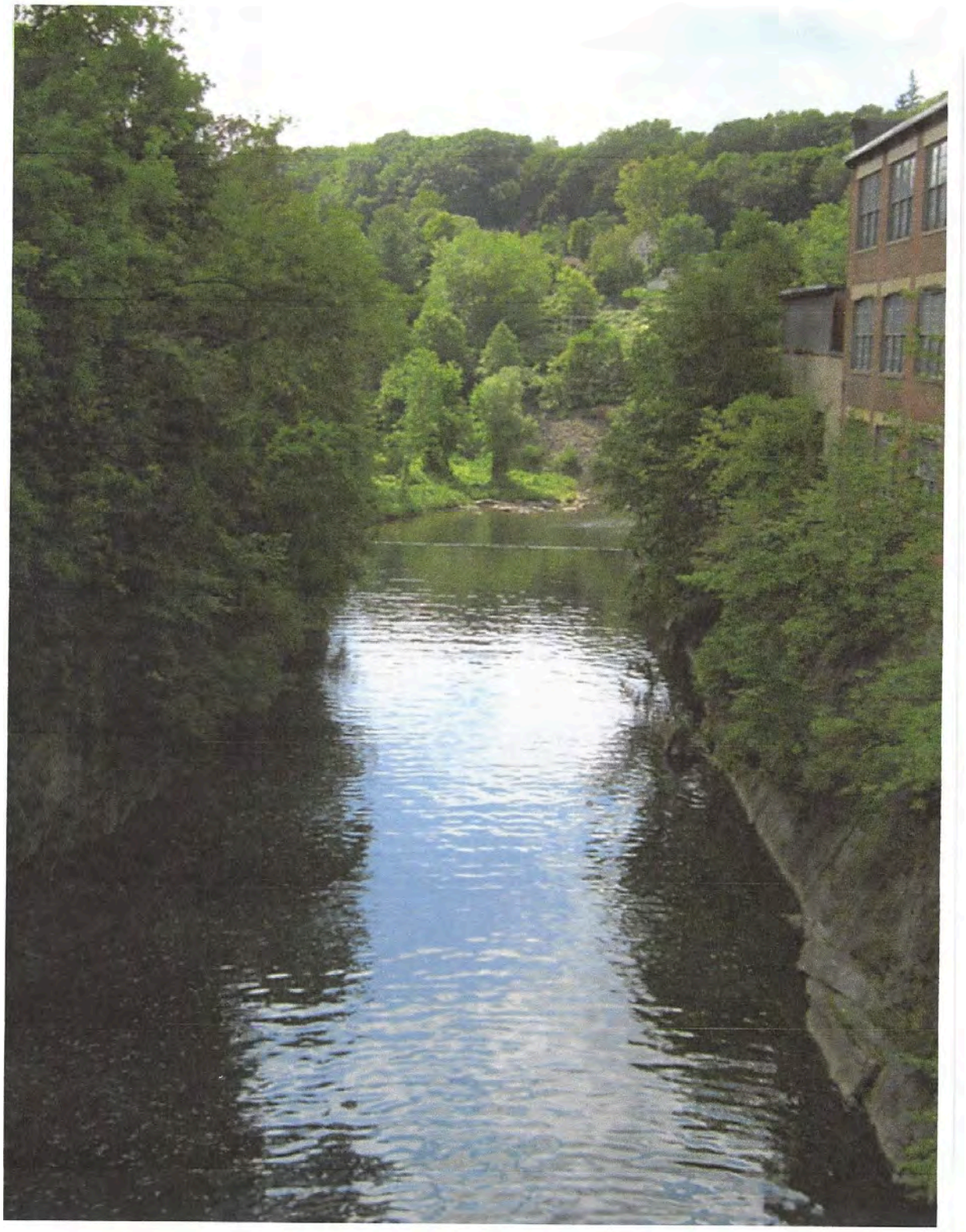
Appendix H1 Slack Dam Powerhouse Photo



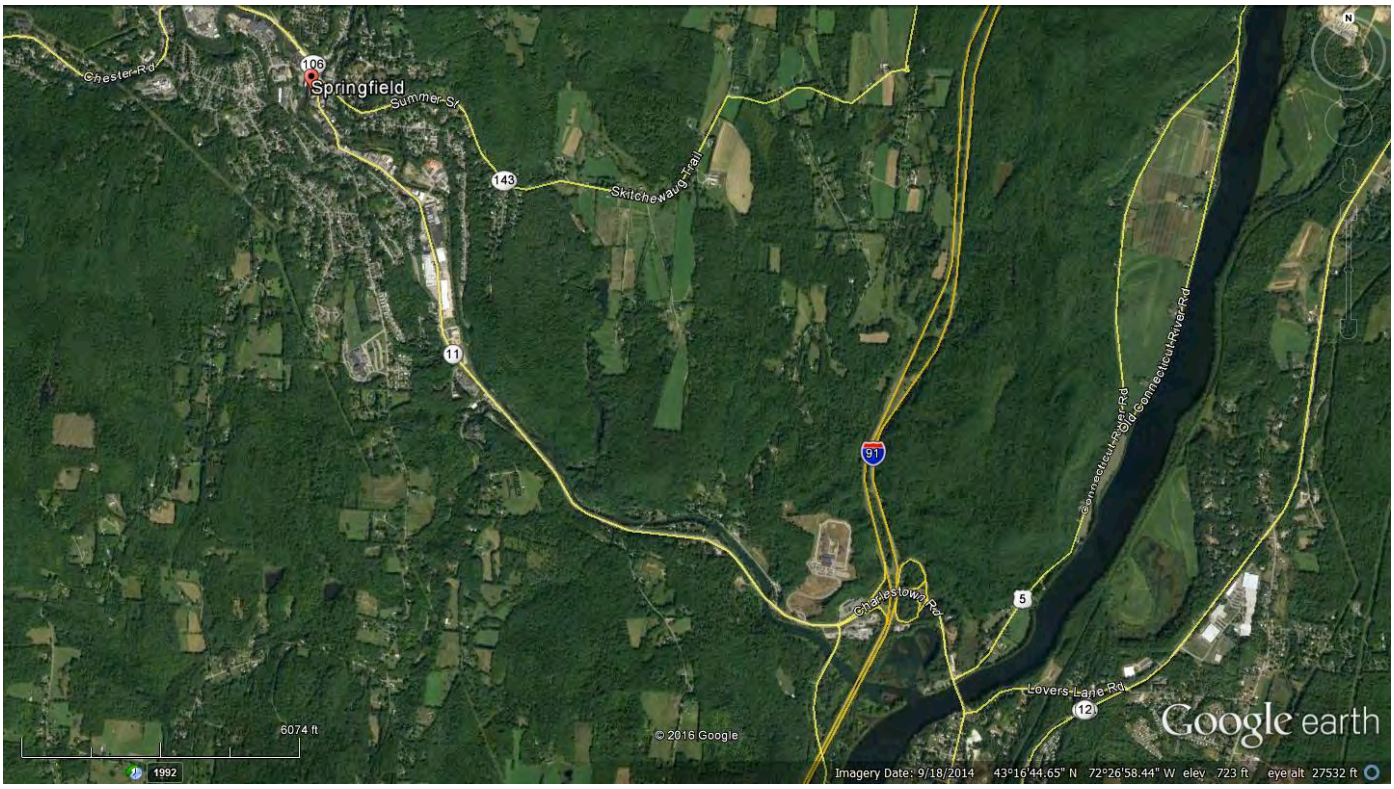
Appendix H2 Slack Dam Zone 1 Photo



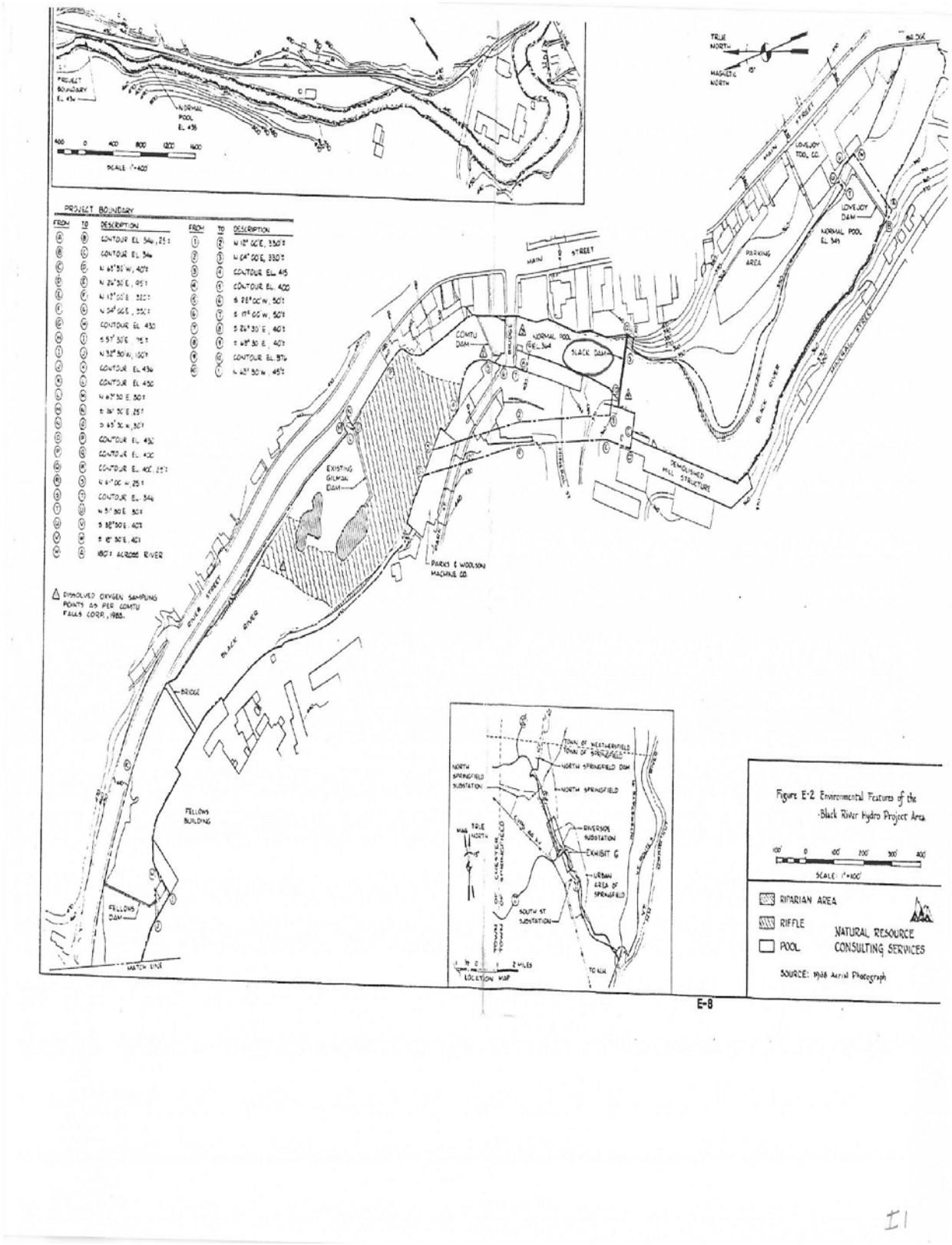
Appendix H3 Slack Dam Zone 2 Impoundment Photo



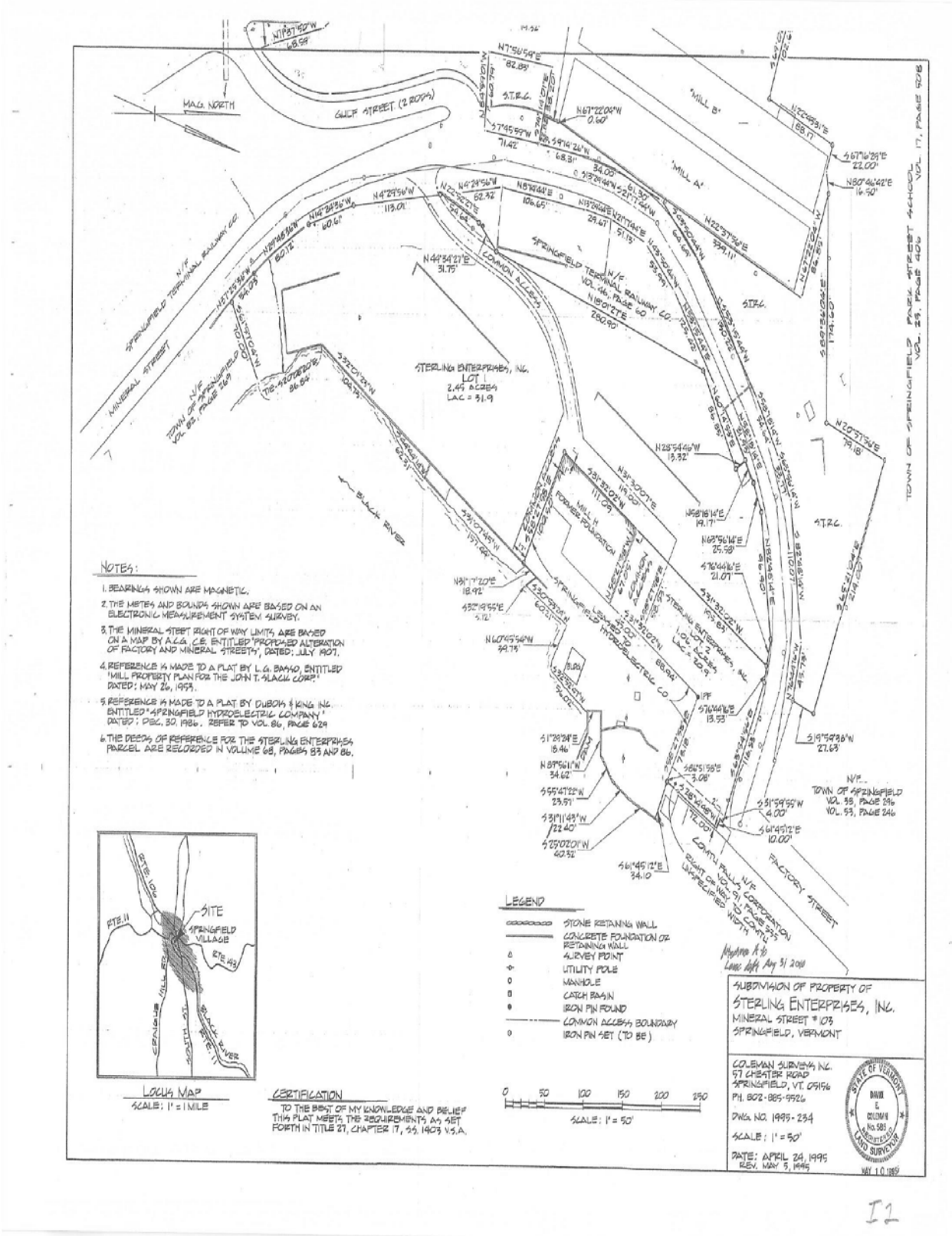
Appendix H4 Slack Dam Zone1 and Zone 2 Photo



Appendix I1 Map of Local Project Areas



Appendix I2 Survey of Zones 1 and 2



I1

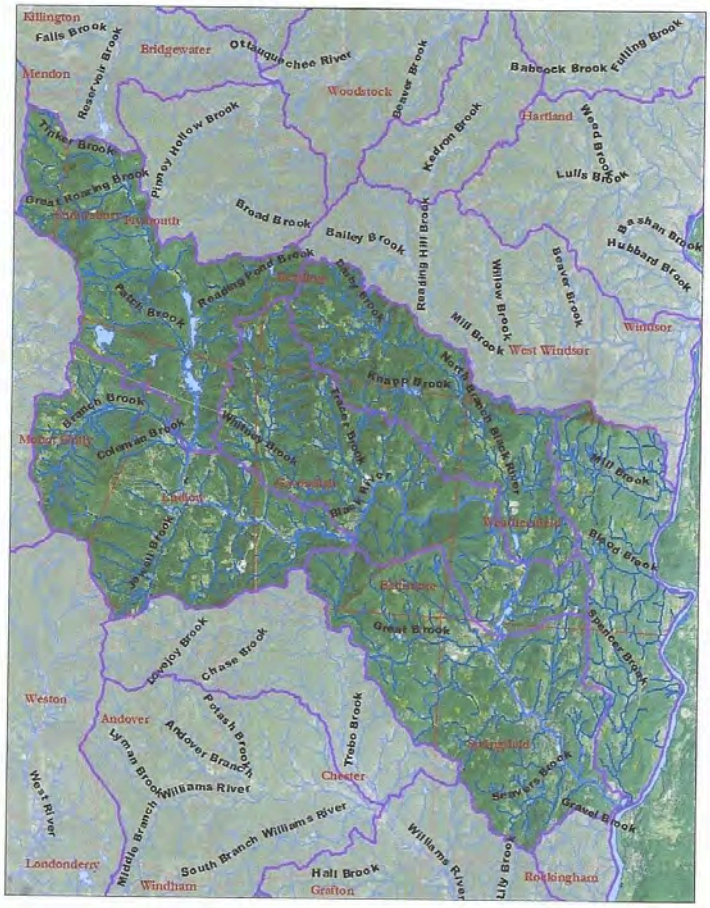
Appendix I3 Map of Black River Drainage Area

Black River Watershed

Updated Water Quality/Aquatic Habitat Assessment Report

Including direct tribs to Connecticut River

Mill Brook, Blood Brook, Spencer Brook



Vermont Agency of Natural Resources
Department of Environmental Conservation
Watershed Management Division
Monitoring, Assessment and Planning Program
June 2016

Appendix J Project Mean daily flows: monthly and yearly averages

Mean Daily Flows at:	Slack Dam
Site Drainage Area:	190 Sq. mi
USGS Gage:	#01153000 N. Springfield, VT
Gage Drainage Area	158 Sq. mi

Month	Qcfs
Jan	392
Feb	339
Mar	485
Apr	547
May	510
Jun	351
Jul	210
Aug	159
Sep	112
Oct	280
Nov	415
Dec	450
Average	355

Appendix K Local, State and Federal Agency Contacts

Agency Contact (check area of concern: Flows_**x**_, Water Quality_**x**_, Fish/Wildlife Resources_**x**_, Watersheds_**x**_, T/E Spp_**x**_, Cultural/Historic Resources_**x**_, Recreation__):	
Agency Name	VT Department of Environmental Conservation
Name and Title	Jeff Crocker
Phone	802-490-6151
Email address	Jeff.crocker@Vt..gov
Mailing Address	1 National Life Drive Main 2 Montpelier, VT 05620

Agency Contact (check area of concern: Flows_**x**_, Water Quality_**x**_, Fish/Wildlife Resources_**x**_, Watersheds_**x**_, T/E Spp_**x**_, Cultural/Historic Resources_**x**_, Recreation__):	
Agency Name	VT Agency of Natural Resources
Name and Title	James McMenemy, District Fisheries Biologist
Phone	802-885-8829
Email address	Jay.Mcmenemy@anrmail.anr.state.vt.us
Mailing Address	100 Mineral St. Springfield, VT 05156

Agency Contact (check area of concern: Flows_**x**_, Water Quality_**x**_, Fish/Wildlife Resources_**x**_, Watersheds_**x**_, T/E Spp__, Cultural/Historic Resources__, Recreation_**x**_):	
Agency Name	VT Dept. of Fish and Wildlife
Name and Title	Rod Wentworth
Phone	802-595-5179
Email address	rod wentworth@state.vt.us
Mailing Address	National Life Drive, Davis 2, Montpelier, VT 05620

Agency Contact (check area of concern: Flows_ _, Water Quality_**x**_, Fish/Wildlife Resources_**x**_, Watersheds_**x**_, T/E Spp__, Cultural/Historic Resources_**x**_, Recreation__):	
Agency Name	VT Dept of Environmental Conservation
Name and Title	Eric Davis, River Ecologist
Phone	802-490-6180
Email address	eric.davis@state.vt.us
Mailing Address	1 National Life Dr. Montpelier, VT 05620

Agency Contact (check area of concern: Flows__, Water Quality__, Fish/Wildlife Resources__, Watersheds__, T/E Spp__, Cultural/Historic Resources_**x**_, Recreation__):	
Agency Name	VT Department of Historic Preservation
Name and Title	Laura Treischmann, VT Historic Preservation Director
Phone	802-828-3222
Email address	Laura.Treischmann@Vt.gov
Mailing Address	One National Life Drive Montpelier, VT 05620

Agency Contact (check area of concern: Flows_**x**_, Water Quality__, Fish/Wildlife Resources_**x**_, Watersheds__, T/E Spp__, Cultural/Historic Resources__, Recreation__):	
Agency Name	US Fish and Wildlife Service-NE Field Office
Name and Title	Melissa Grader, Fish and Wildlife Biologist
Phone	413-548-8002 x8124
Email address	melissagrader@fws.gov
Mailing Address	103 E. Plumtree Rd Sunderland, MA 01375

Agency Contact (check area of concern: Flows_, Water Quality_, Fish/Wildlife Resources_**x**, Watersheds_**x**, T/E Spp_**x**, Cultural/Historic Resources_**x**, Recreation_**x**_):	
Agency Name	Massachusetts Department, Division of Watershed Management
Name and Title	Robert Kubit
Phone	508-767-2854
Email address	robert.kubit@state.ma.us
Mailing Address	627 Main Street Worcester, MA 01608

Agency Contact (check area of concern: Flows**x**_, Water Quality_**x**_, Fish/Wildlife Resources_**x**_, Watersheds__, T/E Spp__, Cultural/Historic Resources__, Recreation__):	
Agency Name	Division of Ecological Restoration, MA Department of Fish and Game
Name and Title	Cindy Delpapa
Phone	617-626-1500
Email address	Cind.delpapa@state.ma.us
Mailing Address	251 Causeway St. Suite 400 Boston, MA 02114

Appendix L Local non-government stakeholder Contacts

Contact (check area of concern: Flows__, Water Quality_x_, Fish/Wildlife Resources_x_, Watersheds_x_, T/E Spp_x_, Cultural/Historic Resources_x_, Recreation_x_):	
Org. Name	VT Public Interest Group
Name and Title	Paul Burns, Executive Director
Phone	802-223-5221
Email address	www.vpirg.org
Mailing Address	141 Main Street Montpelier, VT 05602

Contact (check area of concern: Flows__, Water Quality_x_, Fish/Wildlife Resources_x_, Watersheds_x_, T/E Spp__, Cultural/Historic Resources_x_, Recreation__):	
Org. Name	Renewable Energy VT
Name and Title	Olivia Campbell Anderson, Executive Director
Phone	802-229-0099
Email address	www.revermont.org
Mailing Address	33 Court Street Montpelier, VT 05602