

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

AMERICAN WHITEWATER, APPALACHIAN MOUNTAIN CLUB, AND
NEW ENGLAND FLOW COMMENTS ON RELICENSING STUDY 31: WHITEWATER
BOATING FLOW ASSESSMENT FOR THE BELLOWS FALLS AND WILDER
HYDROELECTIC PROJECTS (FERC PROJECT NOS. 1855 & 1892)

American Whitewater (AW), Appalachian Mountain Club (AMC), and New England FLOW (FLOW) submit these comments to FERC in response to *Relicensing Study 31: Whitewater Boating Flow Assessment -Bellows Falls and Sumner Falls*. This study was filed by TransCanada on March 1, 2016 in response to the FERC Study Plan Determination for the relicensing of the Bellows Falls and Wilder hydroelectric projects. The Licensee conducted this study in response to requests filed by FERC, our organizations, and resource agencies requesting that the licensee study the impact of its hydroelectric operations on the recreational boating opportunities available to non-motorized boaters in and below the project areas. The study addresses the impact of the Licensee's operations on whitewater boating opportunities in: (1) the Sumner Falls section of the Connecticut River located approximately 9 miles below the Wilder Dam in Hartland, VT, and, (2) the "bypass reach" located in the natural river channel on the Connecticut River below the Bellows Falls Dam. AW, AMC, and FLOW have reviewed the results of TransCanada's Study Report and submit the following comments to assist FERC in developing appropriate license conditions that are protective of power and non-power values alike.

American Whitewater is a national non-profit 501(c)(3) river conservation and recreation organization founded in 1954 whose mission is to protect and restore our nation's whitewater resources and to enhance opportunities to enjoy them safely. Our members are primarily conservation-oriented kayakers and canoeists, many of whom live and/or engage in recreational boating in Massachusetts. Since 1876, the Appalachian Mountain Club has promoted the protection, enjoyment, and understanding of the mountains, forests, waters, and trails of the Appalachian region. It is the largest conservation and recreation organization in the Northeast with more than 90,000 members. Since 1988 New England FLOW (FLOW) has promoted the protection, enjoyment, and understanding of the mountains, forests, waters, and trails of the New England region. FLOW is the largest coalition of whitewater boaters in the Northeast. Our organizations have been deeply involved with hydropower relicensing for more than 25 years and have participated in the design and implementation of numerous controlled-flow whitewater boating studies throughout the northeast.

General Comments

AW, AMC, and FLOW actively participated in the design and implementation of the Whitewater Boating Flow Assessment through the selection of study participants, development of survey instruments, and coordination of logistics for the study at both the Sumner Falls and Bellows Falls study sites. During the Sumner Falls boating assessment on June 28 & 29 in 2014, 18 experienced whitewater boaters evaluated 5 flows ranging from 3,700 to 13,000 cfs. During the

Bellows Falls assessment on May 30 & 31 of 2015,¹ 13 experienced whitewater boaters evaluated 9 flows ranging from 1,580 to 9,660 cfs. Given the unique safety challenges at the Bellows Falls location, several boaters were assigned as safety either on the water or on the shoreline during the study.

At the conclusion of each boating flow, participants completed a flow evaluation survey. While not every participant evaluated every test flow due to either scheduling or skill level, participants were asked to complete a comparative evaluation form at the conclusion of the study to identify minimum boatable and optimal flow levels. While responses varied by craft and skill level, participants were able to identify minimum acceptable and optimal boating flows.

Our organizations would like to commend TransCanada and their consultant, the Louis Berger Co. for the effort and detail put into developing this report. We commend the Licensee for the manner in which it conducted the on-water evaluation, providing participants with transportation, meals, camping, and assistance with the difficult access challenges at the Bellows Falls location. The whitewater controlled flow studies were physically demanding on both study participants and TransCanada's employees and consultants, requiring long days and often challenging weather conditions and topography to capture an accurate evaluation of river features. The data that was gathered represents what we believe is an accurate assessment of the whitewater recreational features available at each site that does or could provide whitewater recreation on a sustainable basis throughout the paddling season.

- Sumner Falls

The flow operations and management of the Wilder Dam have significant negative recreational impacts and related socio-economic impacts. By changing the operational scenario of the Wilder Dam Project, the potential exists to create new tourism products for a region that is primed to capitalize on it.

Study Participants rated nine characteristics of boating for each flow including: its boatability, difficult rapids, large hydraulics, and the availability of playboating, potential instream hazards and the overall whitewater challenge. All boaters rated the Sumner Falls site and each flow as higher than acceptable across the entire range of flows, and would provide an important regional resource throughout the paddling season if water was available on a regularly scheduled basis.

There are many "catch on the fly" waves and the area is an excellent place for training beginning boaters and for playboaters. At generational and higher flow levels, this site provides excellent surfing and currents for squirt boating. At moderate flows the run provides opportunities to complete a wide array of acrobatic tricks called "freestyle" paddling. All manufacturers of kayaks design boats for this purpose.

If regularly scheduled flows of varying frequency were provided, the recreational use of the resources at this project have the potential to add economic value to the region, given its central

¹ The flow assessment was conducted in the natural river channel in Walpole, NH, below the Bellows Falls Dam.

location and its proximity to Dartmouth College, Norwich University, and the communities of Bellows Falls, Springfield, and White River Jct., Vermont, as well as Lebanon, New Hampshire. Boaters would flock to Sumner Falls when other regional resources dry up after spring runoff if predictable flows were provided at Sumner Falls.

The current operation of the project impacts valuable seasonal paddling opportunities for both whitewater and flatwater boaters downstream from the Wilder project. At low flows, the CT River becomes too shallow to paddle. Some of the economic and recreational opportunities eliminated at Sumner Falls by the project could be restored by the development of a release schedule that could provide flows of varying volume and could be used at Sumner Falls from the late spring through the early fall months. This recreation-flow relationship would need to be substantiated through both operational analyses and the whitewater attributes that have been identified in the flow study.

- Bellows Falls

The Bellows Falls bypass reach, the natural riverbed of the Connecticut River, has the ability to offer paddling opportunities of sufficient quality when sufficient flows are provided. Under current operations, this section of the Connecticut River is completely dewatered except for times when flows exceed the Licensee's hydraulic capacity of approximately 10,600 cfs, or due to leakage of 125 cfs from damaged dam seals. There are no mandated conservation flows into the bypass reach, resulting in severe damage to aquatic habitat below the dam. Approximately four-tenths of a mile below the primary dam sits a low-head dam that was constructed in 1982 as part of efforts to restore Atlantic Salmon to the Connecticut River. See Appendix A. The purpose of the "fish stopper" dam was to divert Atlantic Salmon into the fish ladder in the power canal. Notwithstanding these restoration efforts, the restoration program has been largely abandoned. The low-head dam no longer serves any purpose and is an impediment to the restoration of habitat and recreation opportunity.

The Bellows Falls project eliminates natural flows from the 0.7-mile reach of the Connecticut River, with flows above the low-head dam virtually non-existent for most of the year except during the spring freshet and after very high rainfall events. The area below the low-head dam is unnaturally backwatered by project operations. Public access to the natural river channel is severely limited and there is no portage trail around either the primary or low-head dams that would enable downstream navigation at the project. Put-in access to the reach for the whitewater boating study required descending a steep embankment from TransCanada's property on NH-RT 12 in North Walpole and the take-out egress from the east side of the riverbank up a less steep embankment to shoulder along NH-RT 12. The current operation of the project virtually eliminates any valuable paddling opportunities.

Study participants evaluated 9 different flows over the course of two days that ranged from Class II to Class IV, and because of the fish barrier dam at the end of the run, boaters were unable to evaluate flows in the lower portion of the bypass reach. While all flows were considered boatable by the participants, there was a diversity of opinion regarding which flows were optimal depending on skill level and craft. Most participants agreed that the boating public would utilize

the resource providing that the Licensee release sufficient flows, create adequate access, and remove the fish barrier dam.

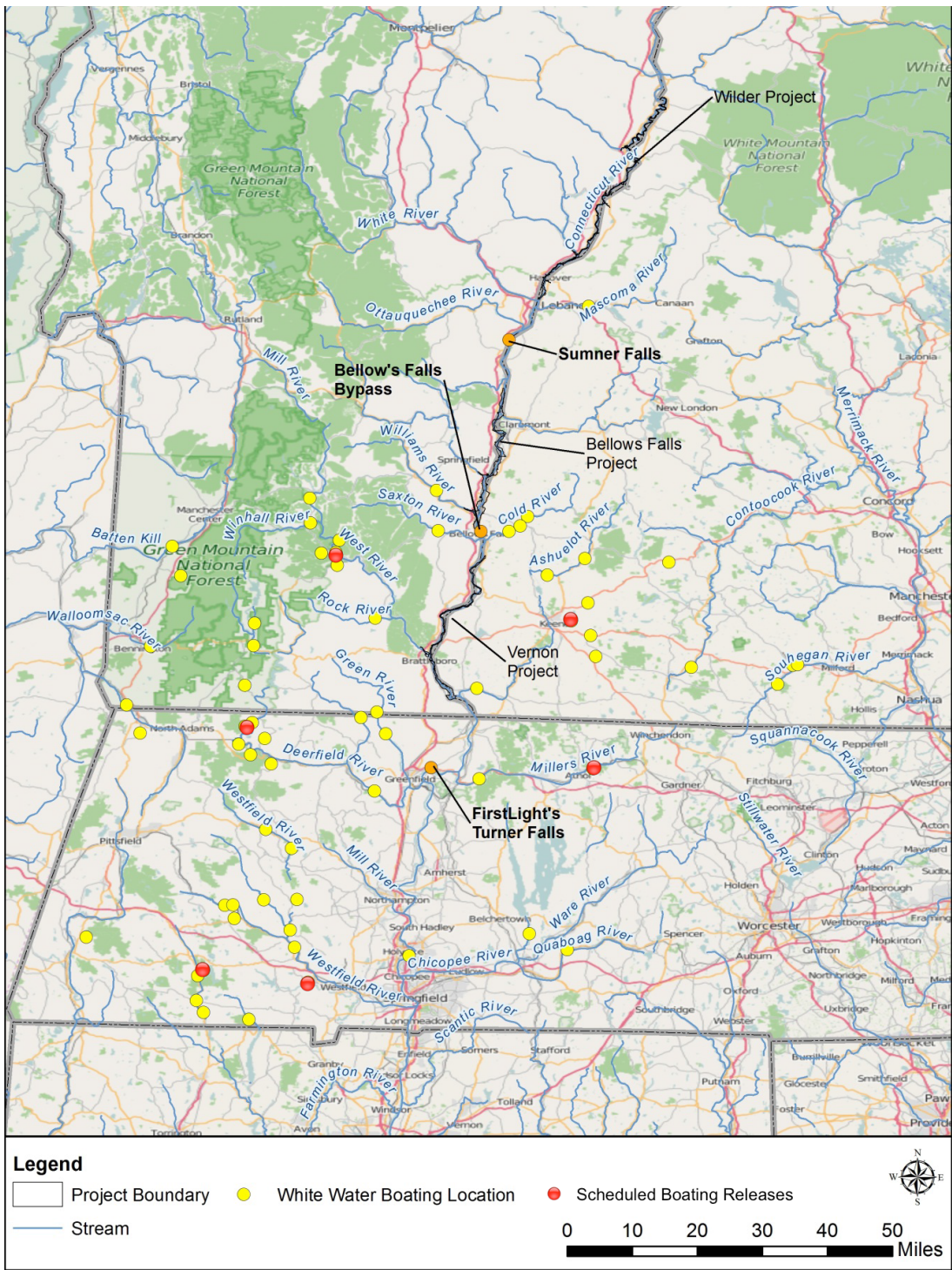
The diversion of flows from the natural river channel into the Licensee's powerhouse has significant negative recreational impacts and related socio-economic impacts. By changing the operational scenario of the Bellows Falls Project, providing access, removing the fish barrier dam, and exploring the feasibility for constructing a whitewater park, the potential exists to create new tourism products for a region that is primed to capitalize on it. Retail activity and food and lodging opportunities can be geared toward non-commercial paddlers and tourists who currently travel to the region each year for outdoor adventure activities. These visitors will discover added value to the region.

Specific Comments

- 2.0 Whitewater Recreation Opportunities in the Region

TransCanada provides a map which identifies other whitewater opportunities available in New England that are within a two-hour drive to Sumner Falls and Bellows Falls. The report, however, fails to recognize that, with the exception of the Deerfield River in Massachusetts and several projects located in the mountains of western Maine that have dam releases as a result of FERC license articles, all identified resources are only seasonal in nature.

The map below identifies locations where there are scheduled whitewater boating releases. With the exception of the Deerfield, the rivers shown have no scheduled releases during the summer months and have releases on as few as 1 or days annually, which makes the comparison to the Connecticut River largely irrelevant.



- 3.0 Study Area

Due to the presence of the fish barrier dam in the natural river channel at Bellows Falls, the study area was necessarily limited to the 0.4-mile section of the reach between the primary dam and the 9-foot high fish barrier dam. The barrier dam also had an impact on the presence of rapids hidden beneath the barrier dam pool. Once the barrier dam is removed as a condition of any new license for the project, these rapids will be revealed along with rapids between the barrier dam and the tailrace. In addition, the removal of the barrier dam will address major safety and some access concerns that are raised in the Whitewater Boating Flow Evaluation. Along with removal of the barrier dam, AW, AMC, and FLOW seek a post-license evaluation of flows in the lower portion of the natural river channel from the barrier dam pool to the tailrace. When combined with the results from the Whitewater Boating Flow Evaluation, we will be able to identify minimum acceptable and optimal flows that should be provided in order to mitigate the Licensee's impact on recreational resources.

- 4.0 Controlled Flow Study

At Sumner Falls, the Licensee selected target flows, after consultation with stakeholders, that were within the capacity of its generating units and operating procedures at Wilder Dam. Relicensing provides an opportunity to explore alternatives to current operating procedures, and any new license may be conditioned on a change in operations or require PM&E measures that would mandate flows different from those evaluated during the boating study. It is within the Licensee's operational ability to provide all flows evaluated during the boating study through either generational flows or spillage, limited by seasonal inflows and other operational constraints.

Additionally, measuring flows at Sumner Falls, and to a lesser extent at Bellows Falls, was challenging due to the lack of a USGS gage in the study area. The lack of a gage was particularly challenging at Sumners due to inflows from the Mascoma and Ottauquechee rivers that added significantly to the flows measured on the West Lebanon gage.² As a condition of any new license, we will seek accurate and readily available gage information so that recreational users can determine when flows are appropriate for particular recreational activities.

- 5.0 Results

At Sumner Falls and Bellows Falls, all of the flows evaluated during the study had recreational value, although participant responses varied according to craft and skill level. While there was no single flow that provided an optimal boating experience for everyone at either location, the study demonstrated that several flows at each location produced optimal flows for a majority of participants.

At Sumner Falls, the unusual geological feature provided an optimal boating experience at various flows, as features such as Main Wave and Sign Wave produced whitewater boating

² The USGS-01144500 West Lebanon gage measures flows released from the Wilder Dam plus flows from the White River.

features in certain flow ranges. For example, Main Wave was optimal at flows between 3,800 to 5,000 cfs and boatable at all levels, while Sign wave was present only at higher flows ranging from 11,500 to 13,000 cfs. These flow ranges roughly correspond to the Licensee's generating capacity of either 1 or 2 Wilder units, although optimal flows for Sign Wave would require higher inflows or spillage.³

We agree with the study results showing that "the Sumner Falls complex has broad appeal across a wide range of flows and boater types." We believe that, as a condition of any project license, the Licensee should provide a range of flows that allow an optimal boating experience over the range of flows evaluated, perhaps varying over the course of a single day to provide something for everyone. We are also seeking flows with sufficient frequency to enable the recreation use of Sumner Falls throughout the boating season, particularly during the summer months when other regional boating opportunities are unavailable. These boating opportunities should be made available earlier in the day than would otherwise be available under the Licensee's typical generating regime, as well as later on work days. Daytime flows would also benefit summer camps such as the Keeywaydin Camp in Salisbury, VT that periodically utilize this section of the Connecticut River. Unfortunately, under current operations, flows at Sumner Falls are unpredictable, and as a result, reduce opportunities for recreational use. We are seeking guaranteed boating flows under any new project license.

USGS gage information for the Connecticut River at West Lebanon for the period from 1911 to 2014 shows that mean daily flows on the Connecticut River are within boatable ranges on every day of the year, with the lowest mean daily flows of 2,500 to 3,000 cfs occurring during the late August to early September period. It is unlikely that there are any flows at Sumner Falls that are unboatable given the wide river bank, although certain features that are available at the optimal flows identified in the study will certainly wash out at higher flows. While there are no "natural" flows at Sumner Falls due to hydropower operations at Moore, Comerford, Macindoes, and Wilder dams, there are sufficient flows from tributaries to support recreational boating throughout the boating season. In addition, the Licensee's hydropeaking operations produce flows throughout even the driest months that are sufficient to provide an optimal boating experience if timed to maximize recreational use. There are no comparable locations to Sumner Falls within a 2-hour driving distance from Hartland, VT, and the closest location is Wave-o-Saurus, approximately 100 miles away in Holyoke, MA, is only available on a few days each year and rarely available outside of the early spring freshet.

At Bellows Falls, recreational use of the natural river channel is completely eliminated by the lack of flows, the lack of access, and the presence of the fish barrier dam. These obstructions do not alter the fact that the Connecticut River is a navigable waterway that is capable of supporting a variety of uses including recreational boating. In 1941, the Supreme Court of New Hampshire

³ Although the study asserts that flows as low as 700 cfs are boatable, the lowest estimated flow at Sumner Falls was 4,700 cfs. There is no basis for concluding that flows at the 700 cfs level provide a minimally acceptable boating experience and are outside of the optimal ranges identified in the boating flow evaluation. Furthermore, as downriver boaters with experience on the Connecticut River below Sumner Falls can attest, flows at this very low level have a significant negative impact on recreational use.

affirmed the trial court's ruling that "it is not questioned that the [Connecticut River] all the way from its source is a public water way." *St. Regis Paper Co. v. New Hampshire Water Resources Board*, 26 A.2d 832, 840, 92 N.H. 164, 173 (1942). The State of New Hampshire holds in trust all the public waters, including navigable rivers, for the use and benefit of the people of the state. Public waters can be used for a variety of uses, including boating, fishing, swimming, and other lawful and useful purposes. In New Hampshire, one of the key provisions of public trust doctrine as it applies to water resources is the "reasonable use" of those resources. The Licensee cannot unreasonably interfere with the water use of the public under New Hampshire law.

In its present state there is currently no formal public put-in access or parking for whitewater boaters or canoeists. While TransCanada contends they own no real estate along the river, their office and parking area located at the site of the whitewater boating study and could provide an adequate put-in location. In order to develop a put-in for access to the whitewater rapids, boaters would still need to descend a steep slope. There are many examples of licensees developing successful access points regardless of steep grades to reach riverbeds, including at Harris Dam (FERC Project P-23229-ME) on the Kennebec River. Similarly, the Licensee should construct stairs to facilitate access to the natural river channel near neat top of the whitewater run below the primary dam. With the removal of the fish barrier dam, the run could end at the boating access location below the bypass reach where flows from the powerhouse rejoin the mainstem of the Connecticut River along the east side of the river on NH-RT 12.

During the 2-day boating evaluation at Bellows Falls, participants evaluated 9 boating flows, all of which provided at least a minimum acceptable rating, although the lowest flow of 1,580 cfs was closer to marginal. As at Sumner Falls, ratings varied by craft and skill level; however, the length of the run and access difficulties were more desirable for those in kayaks than open boaters. In addition, the presence of the fish barrier dam and the inability of participants to evaluate rapids in the barrier dam pool or between the barrier dam and the tailrace will likely impact on optimal flow levels for the entire reach. In addition, the possibility of developing a whitewater park in the natural river channel will also need to be considered when designing features for particular flow levels.

The Bellows Falls flow evaluation did, however, produce useful information regarding optimal boating flows in the upper portion of the study area. The highest participant responses showed a double peak, as was the case at Sumner Falls, with flows in the areas of 2,500 cfs and 5,000 cfs generally producing the highest overall satisfaction for the majority of participants. We agree with the study results suggesting that there is potential for this area to provide whitewater opportunities.

Determining how Bellows Falls would compare to other regional boating opportunities is difficult at this stage, as issues such as flow levels, access, removal of the fish barrier dam, and the possibility of developing a whitewater park will all impact on the desirability of the boating opportunity. There are very few scheduled boating releases in the region, particularly during the summer months. Providing seasonally appropriate guaranteed flows into the natural river channel would provide a highly valuable regional boating opportunity throughout the late-spring to fall boating season.

Furthermore, restoring flows and removing the fish barrier dam will have a positive impact on aquatic habitat, and we support requiring an appropriate Aquatic Base Flow in the natural river channel and the construction of fish passage facilities. AW, AMC, and FLOW request (i) boatable flows in the natural river channel, or bypass reach, such as the US Fish and Wildlife Service's minimum Aquatic Base Flows (ABF) minimum (2,607 cfs or inflow when less, based on 0.5 csm and a drainage area of 5,414 mi²), and (ii) scheduled seasonal pulse flows in sufficient frequency, magnitude, and timing, which will restore aquatic habitat and provide the opportunity for whitewater boating in the natural river channel below the Bellows Falls Dam. AW, AMC, and FLOW support completion of the remaining aquatic studies to further refine appropriate bypass flows in order to restore the aquatic habitat in the natural river channel that has been so damaged by the Licensee's operation.

USGS gage information for the Connecticut River at North Walpole (USGS-01154500) for the period from 1946 to 2014 shows that the Licensee has the ability to release flows into the natural river channel that are within the range of flows evaluated in the boating study throughout the year except during the spring freshet when spillage exceeds the Licensee's hydraulic capacity by more than 10,000 cfs, or the highest flow evaluated during the study. It is unknown at what level the natural reach can be boated once the fish barrier dam is removed. Other than during the spring freshet, mean daily flows in the range of those evaluated during the boating study occur daily at Bellows Falls, including the driest month from mid-August to mid-September when inflows are still sufficient to provide an optimal boating opportunity if flows were restored to the natural river channel.

Conclusion

In making a public interest decision, FERC must weigh the value of water in the river against the restriction of flows held only for power generation. A comprehensive plan for the management of flows should strike the appropriate balance. In this case, because of the potential for increased recreational usage with scheduled variable flows, we believe FERC should also weigh the predicted economic value associated with the recreational use when looking at various alternatives.

Our organizations appreciate the time and effort that was put into the TransCanada Whitewater Boating Flow Evaluation, and the data presented will be helpful in developing predictable and stable river-based recreation for the region. We look forward to working with the applicant and other stakeholders to develop PM&E measures that will balance power generation with all other non-power values.

American Whitewater, Appalachian Mountain Club, and New England FLOW respectfully request that FERC consider these comments in evaluating the impact of the Licensee's operations on recreation and other resources.

Respectfully submitted this 2nd day of May, 2016.

Bob Nasdor
Northeast Stewardship Director

American Whitewater
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Sudbury, MA 01776

Dr. Ken Kimball
Director of Research AMC
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Thomas J. Christopher, Secretary/Director
New England FLOW
252 Fort Pond Inn Road
Lancaster, Massachusetts 01523

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

**Bellows Falls and Wilder
Hydroelectric Projects
TransCanada**

FERC Project No. 1855 & 1892

CERTIFICATE OF SERVICE

Pursuant to Rule 2010 of the Commission's Rules of Practice and Procedure, I hereby certify that I have this day caused the foregoing **American Whitewater, Appalachian Mountain Club and New England FLOW's Comments on TransCanada's Relicensing Study for the Bellows Falls and Wilder Hydroelectric Projects (P-1855 and 1892)** to be served upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated this 2nd day of May 2016.



Megan Hooker
American Whitewater

May 18, 1982

Subject: Bellows Falls Fishway Construction Plans

From: Ben Rizzo, Engineering Advisor, Conn. River Technical Committee

Upon review of the final construction plans for the Bellows Falls Fishway forwarded by NEPSco on April 30, 1982, the following items were noted:

General

1. Each spring the lower portion of the fishway (in tailrace area) will be flooded by high river flows (70-90,000 cfs). To eliminate operation and maintenance problems caused by floating debris settling in the lower fishway pools, floor grating should be installed over the top of the fishway up to elevation 248-250'.
2. An access walkway and railing should be provided along the top of the fishway wall for maintenance and inspection purposes. (Similar to Turners Falls & Brunswick Projects).
3. The fishway is scheduled to operate at tailwater levels up to elevation 234, which corresponds to a river flow of approximately 28,000 cfs. As presently designed, the lower fishway pools will be overtopped at these flows since the top of the fishway is at elevation 235' in the tailrace area. The minimum elevation for the top of the fishway in the tailrace area should be approximately 236.5'.
4. Our experience with the vertical slot fishway at the Rainbow Dam on the Farmington River in Connecticut indicates that American Shad suffer excessive injury and scale loss, primarily by fish coming into contact with the baffles and slots during fall back activity. To reduce this problem at the Bellows Falls Fishway, the exposed corners of the concrete baffles have curved surfaces. However, we anticipate that in a few years these concrete surfaces will be roughened by scouring of the fine material, exposing the coarser aggregate material for contact by shad. We strongly recommend installing permanent smooth nosing at the three exposed surfaces of each vertical slot baffle, either PVC or aluminum piping cut to the appropriate size could be used for this purpose.

Sheet #204-1 - The elevation of a typical slotted weir shows a 6" high concrete sill at the base of the slot. This sill should be deleted.

Sheet #213-1 - Section 1-1 The sluice gate opening at the upper end of the fishway provides a clearance of only 4-1/2 inches above normal forebay level. We recommend a clearance of at least 18 inches at this location.

Sheet #226-1 - Section 9 Provide a chamfer on inside walls at windows of Public Viewing Gallery.

Sheet #232-0 - Fish Counting Room, Section 5-5 The visibility at the observation window will be poor since the fishway walls in this area are approximately 13' high. To improve natural lighting we suggest lowering the free standing wall opposite the window to a height of 8 feet. The pipe sleeve over the window should be raised approximately two feet.

The downstream migrant pipe in the counting room may require insulation to eliminate condensation.

Sheet #264-0 & 265-1 - Fish Barrier Dam

The proposed fish barrier dam (crest elevation 238.5) is very similar in elevation to the presently existing waterfall. The new barrier dam as proposed will probably be negotiable by salmon when river flows exceed 17,000 cfs (Tailwater = 231 feet).

The crest elevation of the fish barrier dam shown on the Exhibit "S" drawings dated June 1979 is elevation 250, which is approximately 11.5 feet higher than the presently proposed barrier dam. We recommend moving the barrier dam approximately 40 feet upstream to the crest of the existing waterfall and constructing a barrier dam approximately 10 feet high with a crest elevation of at least 248 feet \pm .

Sheet #272-0 - Fish Trap Area, Structural Details

The proposed design indicates floor grating will be located above the counting window. This will restrict visibility at the counting window and we recommend removing the grating from this area.

Sheet #297-1 & 298-1 - Downstream Migrant Pipe & Sluice Gate, Detail Z

The sluice gate stem will restrict the use of the downstream migrant conduit by adult fish. The 3' wide opening should not be obstructed. Twin gate stems or cable supports located at each end of the sluice gate would be satisfactory. Immersed pipe electrodes may also be required to increase adult passage efficiency similar to the Holyoke Project. -- A timber sluice gate may be better suited for this purpose.

The bends in the 24-inch diameter downstream migrant pipe should have a radius of 10 feet.

B. Rizzo

UNITED STATES GOVERNMENT

memorandum

U.S. FISH AND WILDLIFE SERVICE

ONE GATEWAY CENTER
SUITE 700

NEWTON CORNER, MASSACHUSETTS 02158

TO: Files (Conn. River Tech. Committee)

FROM: Ben Rizzo, Hydraulic Engineer - *BR*
Engineering Advisor

DATE: July 5, 1982

SUBJECT: June 17/82 Meeting at Bellows Falls Fishway Construction Site
Bellows Falls Dam - Connecticut River, Vermont

On June 17/82 I met with the following personnel at the Bellows Falls Fishway, presently under construction at the Bellows Falls Dam on the Connecticut River in Vermont:

Conn. River Tech Committee:

Steve Rideout, (Coordinator) FWS Hadley, MA
Angelo Incerpi, (Chairman) VT. F & G
Ken Cox., (Biologist) VT. F & G

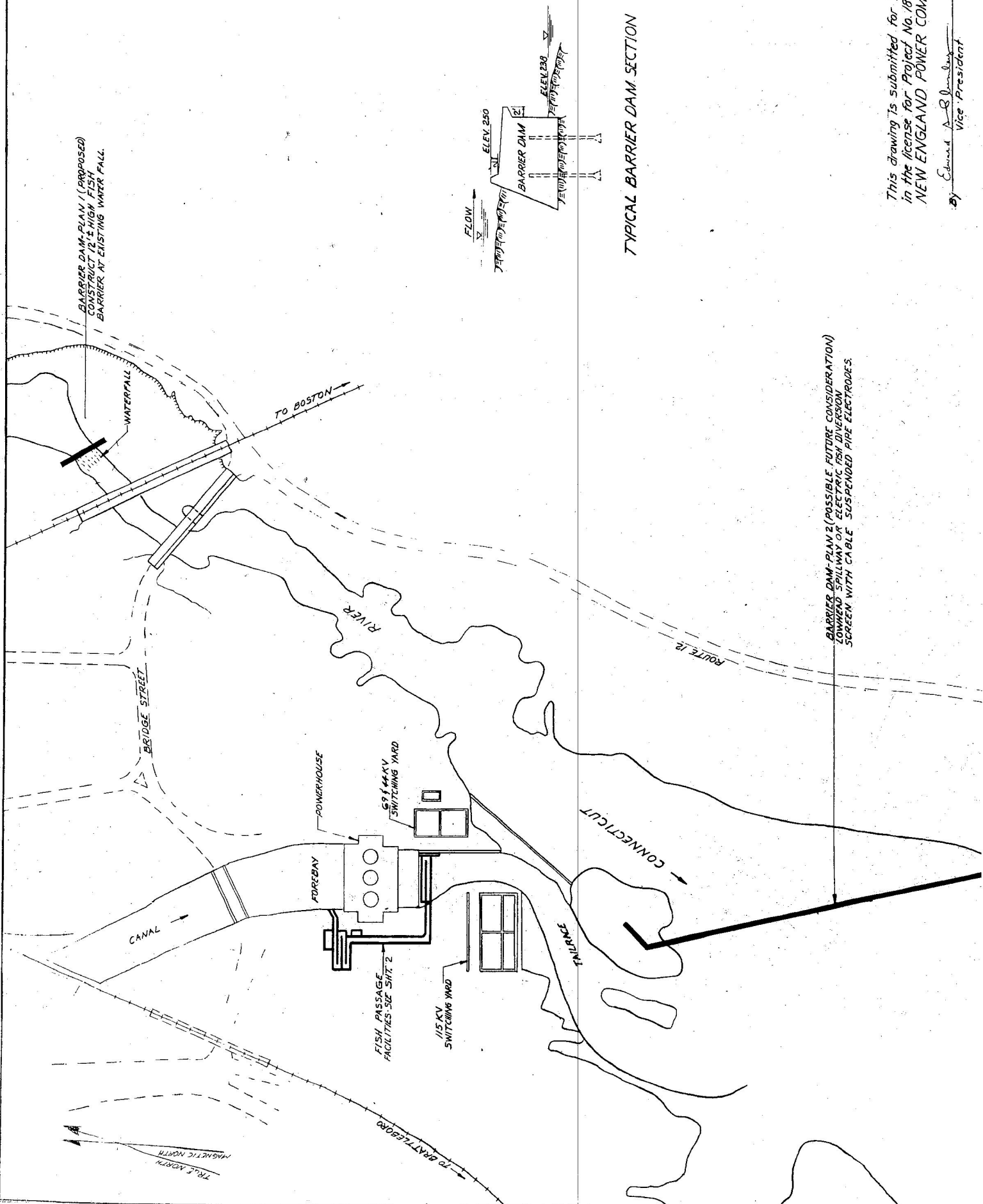
NEPSCo (New England Power Service Company)

Armond Millette, Senior Engineer

The purpose of the meeting was to inspect project construction which commenced on May 10/82 and is proceeding on schedule and to discuss fishway modifications recommended by the Technical Committee (copy attached).

NEPSCo indicated they concur with the suggested modifications and will forward a written response to the technical Committee regarding the incorporation of these modifications in the project.

Attachment



TYPICAL BARRIER DAM SECTION

BARRIER DAM - PLAN 2 (POSSIBLE FUTURE CONSIDERATION)
LOWHEAD SPILLWAY OR ELECTRIC FISH DIVERSION
SCREEN WITH CABLE SUSPENDED PIPE ELECTRODES.

This drawing is submitted for inclusion
in the license for Project No. 1855
NEW ENGLAND POWER COMPANY

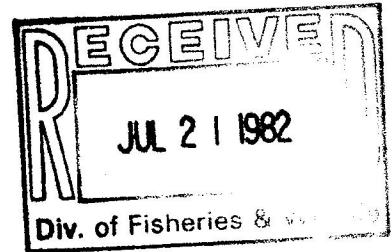
By Edward A. [Signature]
Vice President

OATIS

New England Power Service

New England Power Service Company
25 Research Drive
Westborough, MA 01581
Tel. (617) 366-9011

8 July 1982



FEDERAL ENERGY REGULATORY COMMISSION
New York Regional Office
26 Federal Plaza
New York, New York 10278

Attention: Mr. James D. Hebson

New England Power Company
BELLOWS FALLS PROJECT - FERC LP NO. 1855 - NH/VT
Fishway Construction Progress Report

Dear Mr. Hebson:

Enclosed is the Second Construction Progress Report for the fishway installation at the Bellows Falls Project for June 1982.

As mentioned in our 8 June 1982 cover letter for the First Construction Progress Report, this report and all subsequent construction progress reports will be furnished to the signatories of the Settlement Agreement.

Very truly yours,

NEW ENGLAND POWER SERVICE COMPANY

Denton E. Nichols

Denton E. Nichols
Project Engineer

DEN/kaa
Enclosure
Copies/Settlement Agreement Signatories
FLS/Mrs. Rosamond Allen
P. S. Foote/FERC/Washington
D. Z. Breck
W. G. Hayes

NEW ENGLAND POWER CO. - CONSTRUCTION SCHEDULE - BELLOWS FALLS FISHWAY

(1982)	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER
• MOBILIZE	██████████						
• CLEAR GRUB	██████████						
• AREA 1 - EXCAV-FORM POURS	██████████	██████████	██████████	██████████	██████████	██████████	██████████
• AREA 2 "		██████████	██████████	██████████	██████████	██████████	██████████
• AREA 3 "		██████████	██████████	██████████	██████████	██████████	██████████
• AREA 4 "		██████████	██████████	██████████	██████████	██████████	██████████
• AREA 5 "		██████████	██████████	██████████	██████████	██████████	██████████
• AREA 6 "		██████████	██████████	██████████	██████████	██████████	██████████
• AREA 7-8-9 (TAILRACE) *		██████████	██████████	██████████	██████████	██████████	██████████
• VISITORS VIEWING AREA		██████████	██████████	██████████	██████████	██████████	██████████
• BARRIER DAM		██████████	██████████	██████████	██████████	██████████	██████████
• DEMOBILIZE **							██████████

*NOTE: THE TAILRACE WILL BE DENATERED DURING THE PERIOD 12 JULY 82 - 10 SEPT 82

FOR CONSTRUCTION OF THE "UNDERWATER COMPONENTS" OF THE STRUCTURE.

** SITE RESTORATION & LANDSCAPING IS SCHEDULED FOR SPRING 1983.

ATM-CE DEPT-6 JUL 82

SEP 16 1982

New England Power Service

New England Power Service Company
25 Research Drive
Westborough, MA 01581
Tel. (617) 366-9011

14 September 1982

FEDERAL ENERGY REGULATORY COMMISSION
New York Regional Office
26 Federal Plaza
New York, New York 10278

Attention: Mr. James D. Hebson

New England Power Company
BELLOWS FALLS PROJECT - FERC LP NO. 1855 - NH/VT
Fishway Construction Progress Report

Dear Mr. Hebson:

Enclosed is the Fourth Construction Progress Report for the fishway installation at the Bellows Falls Project for August 1982.

Very truly yours,

NEW ENGLAND POWER SERVICE COMPANY

Denton E. Nichols

Denton E. Nichols
Project Engineer

DEN/kaa

Enclosure

Copies/Settlement Agreement Signatories

FLS/Mrs. Rosamond Allen
P. S. Foote/FERC/Washington
D. Z. Breck
W. G. Hayes
L. C. Underwood

FISHWAY CONSTRUCTION PROGRESSREPORT NO. 4GENERAL PROGRESS

This report covers the design and construction progress for the month of August 1982.

Engineering & Design

Revisions were made to the barrier dam drawings due to location change, optimizing better foundation conditions with minimal bedrock excavation. The Contractor's submittal for a steel bulkhead to seal off the intake structure through the canal wall was approved for fabrication. The Visitor's Center architectural and structural drawings were completed, including the building specifications.

Basically all reinforcing steel drawings have been approved by the Design Department for the remainder of the job. Other submittals for construction materials and embedments are being reviewed and approved as received.

Miscellaneous

Arrangements were made with the Contractor to pump out the three draft tubes, allowing access and inspection by the New England Power Service Company engineering personnel. The draft tube concrete was found to be in excellent condition, except for several localized eroded areas in the arch at the draft tube/elbow construction joint. These areas in Units 2 and 3 will be repaired by the Contractor prior to cofferdam removal.

CONSTRUCTION PROGRESS

The Contractor concentrated his work effort in the tailrace area (Areas 7, 8, & 9) and Areas 4, 5 & 6 during this period. The tailrace work was conducted on a two - 12 hour shift basis, seven days per week. The following was accomplished: completed tailrace area dewatering and side wall bedrock excavation; placed reinforcing steel and poured concrete for Nos. 1 and 2 draft tube extensions, placed steel and poured No. 3 draft tube side walls, placed steel and formed walls over No. 1 and 2 draft tubes; continued overburden and bedrock excavation in Areas 2, 3, 5 & 6 as required for the structure, manholes, and sewer lines; installed backfill as needed for slabs and around piers in Areas 2 & 5; yard drainage piping was installed in Area 6 along with the fish sluice piping; in Area 7 placed steel, formed, and poured the pier and walls connecting to the tailrace's west side; embedments have been installed in the walls for the bridge nosings.

The Contractor is planning to install the canal wall steel bulkhead prior to completion of the tailrace work and station start-up.

New England Power Service

New England Power Service Company
25 Research Drive
Westborough, MA 01581
Tel. (617) 366-9011

8 October 1982

FEDERAL ENERGY REGULATORY COMMISSION
New York Regional Office
26 Federal Plaza
New York, New York 10278

Attention: Mr. James D. Hebson

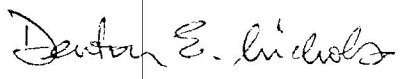
New England Power Company
BELLOWS FALLS PROJECT - FERC LP NO. 1855 - NH/VT
Fishway Construction Progress Report

Dear Mr. Hebson:

Enclosed is the Fifth Construction Progress Report for the fishway installation at the Bellows Falls Project for September 1982.

Very truly yours,

NEW ENGLAND POWER SERVICE COMPANY



Denton E. Nichols
Project Engineer

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Copies/Settlement Agreement Signatories
1 L3/MS. ROSAMOND ALLEN
P. S. Foote/FERC/Washington
D. Z. Breck
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L. C. Underwood

FISHWAY CONSTRUCTION PROGRESS

REPORT NO. 5

placed around piers and under slabs; and reinforcing steel and concrete were placed in slabs and walls in 20% of this area.

Area 3

Rock excavation is 95% complete for the fishway and counting house.

Area 4

The 10" ductile iron sewer line and 24" fish pipe were completed through this area. Reinforcing steel and concrete were placed for the bridge curbs and weir walls. Backfill was partially completed against fishway walls and the structural steel bridge beams were placed.

Area 5

The sewer manhole was completed. Reinforcing steel and concrete was placed in walls which were then partially backfilled.

Area 6

Reinforcing steel and concrete were placed in bridge curbs and structural steel bridge beams were set. Walls were partially backfilled.

Barrier Dam

The access road down into the gorge was completed in anticipation of barrier dam construction.

Status of Construction

The fishway slabs and channel walls are being completed over the draft tube extensions. Work effort is now concentrated in Area 2, Areas 7-9, and (tailrace) at the barrier dam.

The Contractor anticipates completing the concrete structure in 1982 with the Visitor's Center and clean-up scheduled for spring 1983.

It is estimated about 50% of the work has been completed to date.

Construction Difficulties

No major construction problems arose during this period.

Contract Status

None

NOV 8 1982

New England Power Service

New England Power Service Company
25 Research Drive
Westborough, MA 01581
Tel. (617) 366-9011

3 November 1982

FEDERAL ENERGY REGULATORY COMMISSION
New York Regional Office
26 Federal Plaza
New York, New York 10278

Attention: Mr. James D. Hebson

New England Power Company
BELLOWS FALLS PROJECT - FERC LP NO. 1855 - NH/VT
Fishway Construction Progress Report

Dear Mr. Hebson:

Enclosed is the Sixth Construction Progress Report for the fishway installation at the Bellows Falls Project for October 1982.

Very truly yours,

NEW ENGLAND POWER SERVICE COMPANY

Denton E. Nichols

Denton E. Nichols
Project Engineer

DEN/kaa

Enclosure

Copies/Settlement Agreement Signatories
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H. W. Sullivan Jr.
L. C. Underwood

FISHWAY CONSTRUCTION PROGRESSREPORT NO. 6GENERAL PROGRESS

This report covers the design and construction progress for the month of October 1982.

Engineering & Design

The barrier dam alignment was modified at the request of USF&WS to incorporate a 45° bend at the 1/3 point and to provide a better fit to the existing rock contours. A concrete beam was field designed to support the fishway spanning the mill water lines at the Area 1/Area 2 expansion joint. Concrete liners on bedrock at interior attraction water diffuser walls were eliminated to minimize rock excavation and concrete.

Basically all miscellaneous metal, reinforcing and structural steel drawings have been approved by the Design Department for the remainder of the job. Other submittals for construction materials are being reviewed and approved as received.

CONSTRUCTION PROGRESS

The Contractor continued to concentrate on the tailrace work (Area 7, 8 & 9). Concrete slabs and walls above the draft tube extensions were completed. Work is continuing on slabs and walls for the attraction water diffuser and sluiceway extension in Area 9. Work has also concentrated on fishway slabs and walls in Area 2 working towards the intake area. Unit 1 was removed for overhaul in July and will be returned to service in November.

Other work accomplished during October 1982, by areas is as follows:

Area 2

Rock excavation is 100% complete for the fishway and Visitor's Building. Backfill was placed around piers and under slabs; and reinforcing steel and concrete were placed in slabs and walls in 50% of this area.

Area 3

Rock excavation was completed for the fishway and counting house. Work is continuing on fishway and counting house slabs and walls.

Area 6

Reinforcing steel and concrete were placed for the bridge trench drain.

MEMORANDUM

Sent to Tech Comm
12-16-83 DEC 12 1983

TO D. E. Nichols Westborough DATE 8 December 1983
 FROM A. J. Millette Westborough FILE _____
 SUBJECT BELLOWS FALLS FISHWAY -- START-UP TESTING

Bellows Falls fishway was successfully operated on Tuesday 29 November 1983, and is capable of being placed in-service at this time. The operation was witnessed by Steve Rideout and Dave Westerling, USF&WS and Ken Cox, Vermont Fish & Game Department.

The fishway behaved as predicted within the range of design flows and velocities. Equilibrium within the fishway was reached within 30 minutes of opening the headgate and 2 weir bypass gates to accommodate low water level in the forebay (289.1 NGVD). A stable flow pattern of approximately 30 CFS was observed with optimum pool depths of 6' and elevation difference from pool to pool of 12" throughout (see attached photos).

The Visitor's viewing windows were tight and dry with only a teaspoonful of water accumulating at the edge of the stainless steel frame on one window sill after four hours of operation. The fish counting window was tight and dry with about a tablespoonful of water accumulating at the neoprene gasket near the center of the window sill. Two cracks in the concrete below the counting window exhibited slight weeping and will be raked and filled with hydraulic cement. Any weeping through fishway walls was impossible to detect due to rain wetting the concrete. Cold weather contraction of the structure tends to maximize leakage; therefore I expect no problems under normal spring and summer operation.

The attraction water system behaved as predicted and created a distinct plume along the east tailrace wall from the entrance downstream to the tailrace staff gage. Attraction water flow was at the high range of fishway design into a tailrace water level of 232.6', 3.6' above normal due to the high river flow and spilling at the dam. Under this extreme condition, turbulence and backrolling was observed within the fishway entrance above the floor diffuser. This could be due to accumulated sediment in the diffuser not completely washed during the 40 minute operation. Minor spilling of the sluiceway at extreme flow was eliminated by cutting the total attraction water flow from 232 to 193 CFS, and opening the diffuser gates 100%.

It is recommended the attraction water flow be tested further at normal tailwater level and gate openings be re-programmed if necessary. Minor modification may be necessary at the sides of the sluiceway floor inlet to eliminate spilling; although the sluiceway spill does not adversely affect the fishway entrance flow pattern.

We are preparing a punch-list of outstanding items to complete this project. Most of the punch-list work will be completed over the next two months with some weather sensitive items held until spring. The project should remain open pending completion of punch-list work.

D. E. Nichols
Page 2
8 December 1983

We have met the "Settlement Agreement" condition to have the fishway ready for operation by 1 May 1984.

Congratulations and thanks to NEPSCO Maintenance & Construction crews for a high quality job and a smooth start-up. Also a special thanks to Chet Stone, NEPSCO Foreman, and Joe Juscen, Bellows Falls Chief Operator, for their special efforts to make the start-up test a successful one.

a. j. Millette

AJM/kaa
Attachments

Copies/M. R. Anderson
H. H. Bloomfield
D. Z. Breck
R. H. Briggs
R. E. Charpentier
P. D. Dowling
W. K. Irwin
J. Juscen Jr.
G. P. Sasdi
R. M. Shepard
C. R. Stone
H. W. Sullivan Jr.
L. C. Underwood
J. E. Whitcomb

K. Cox /Vermont Fish & Game Department
J. Larsen /Alden Research Laboratories
S. G. Rideout/U.S. Fish & Wildlife Service
D. Westerling/U.S. Fish & Wildlife Service

Document Content(s)

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