



August 12, 2014

**VIA EMAIL**

Brian Harrington, Massachusetts Department of Environmental Protection (MADEP)  
David Foulis, MADEP  
Bob Kubit, MADEP  
Bill McDavitt, National Marine Fisheries Service  
Russ Cohen, MA Riverways  
Kimberly Noake-McPhee, Franklin Regional Council of Governments  
Andrea Donlon, Connecticut River Watershed Council  
Tom Miner, Connecticut River Streambank Erosion Committee  
John Bennett, Franklin Conservation District  
Mike Bathory, Landowners for Concerned Citizens

Re: FirstLight, Relicensing of the Turners Falls Hydroelectric Project (FERC No. 1889) and Northfield Mountain Pumped Storage Project (FERC No. 2485), Study No. 3.1.2- *Northfield Mountain/Turners Falls Operations Impact on Existing Erosion and Potential Bank Instability*.

Dear All,

FirstLight Hydro Generating Company (FirstLight) is currently in the process of relicensing its Turners Falls Hydroelectric Project (FERC No. 1889) and Northfield Mountain Pumped Storage Project (FERC No. 2485) with the Federal Energy Regulatory Commission (FERC).

On August 14, 2013 FirstLight filed its Revised Study Plan (RSP). On September 13, 2013, FERC issued its Study Plan Determination Letter (SPDL) on 20 of FirstLight's 38 proposed studies. FERC delayed issuing a SPDL on the remaining 18 studies because the Vermont Yankee (VY) Nuclear facility, which discharges heated water to the Vernon Impoundment for cooling purposes, is closing no later than December 29, 2014<sup>1</sup>. FERC held a meeting on November 25, 2013 with FirstLight and various stakeholders to determine which of the remaining 18 studies may need to be modified in light of the VY closure. In addition to the remaining 18 studies, Study No. 3.1.2 *Northfield Mountain/Turners Falls Operations Impact on Existing Erosion and Potential Bank Instability* for which FERC already issued a SPDL was mentioned as a study that may need to be re-evaluated due to the closure of VY. More specifically, it was noted at the November 25 meeting, that the Turners Falls Impoundment currently does not completely ice over, which could be attributable to VY's discharge of heated water to the Connecticut

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<sup>1</sup> Entergy, owners of the Vermont Yankee facility, indicated at a November 25, 2013 meeting with FERC that the facility will close no later than December 29, 2014.

**John S. Howard**

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River for cooling purposes. On December 13, 2013, FERC issued an Interim ILP schedule for Study Plan Determination. In the letter FERC states:

*“In addition to the 19 deferred studies, stakeholders noted that the previously approved study 3.1.2: Project Impacts on Existing Erosion and Potential Bank Instability, did not consider ice process erosional effects within the Turners Falls reservoir. As a result, FirstLight requested that it be provided an opportunity to consider whether any modifications to the approved study are needed. Because any modifications to study 3.1.2 for this purpose could not be implemented in 2014 while Vermont Yankee is operational, we recommend that FirstLight evaluate the need for a study modification in consultation with stakeholders during the 2014 study season. FirstLight should present its findings and any proposed modifications to stakeholders, providing 30-days for stakeholder comment, and consider stakeholder input when determining the need for a modification to study 3.1.2. FirstLight should then present its findings and responses to stakeholder comments in its Initial Study Report (ISR) following the 2014 field season”.*

### Study No. 3.1.2 Addendum

FirstLight is currently in the process of conducting the field work for Study No. 3.1.2. As noted in Task 3 of this study, FirstLight recognizes ice as a potential cause of erosion. As part of the 2014 study, representative study sites, representing the range of riverbank characteristics and features of the Turners Falls Impoundment, are being selected for detailed study. FirstLight proposes the following additional steps as part of its data gathering and literature review and geomorphic understanding of the Connecticut River:

- FirstLight will review the U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory (CRREL) database to document known ice jams recorded on the Connecticut River in the between Wilder Dam and Turners Falls Dam. CRREL maintains an ice jam database and clearing house. The database will be inventoried to determine historic ice jams along the Connecticut River. Similarly, FirstLight will contact the U.S. Geological Survey (USGS) to identify any recorded ice jams or ice floes on the Connecticut River at their gaging stations. To be completed in early 2015.
- FirstLight will contact TransCanada to determine if it has any historic and current information on the timing, extent and duration of sheet ice development and ice-break up in the Wilder and Bellows Falls Impoundments. In addition, FirstLight will request any information on the thickness of the sheet ice, if available. Also of interest is whether any ice floes have been documented in these impoundments, below the dams, or at the mouths of major tributaries emptying into the impoundments. FirstLight will also research historic daily air temperature data in proximity to the Wilder and Bellows Falls Impoundment to determine any correlation between air temperature and the timing of ice sheet development and break-up for any historic ice formation data collected by TransCanada. Historic air temperature data will also be collected/obtained near the Turners Falls Impoundment. To be completed in early 2015.
- Assuming safety is not compromised, FirstLight proposes to photograph ice conditions in the Turners Falls Impoundment at relatively accessible locations (upstream and downstream) as follows:
  - Vernon Dam,
  - confluence of Ashuelot River,
  - Pauchaug Boat Launch,
  - Route 10 Bridge,
  - Northfield Tailrace,

- French King Bridge,
- confluence of Millers River, and
- Turners Falls Dam.

The photographs would be obtained from when ice sheet develops until after ice break occurs – roughly December 1 through March 31. FirstLight proposes four site visits to photograph the following:

- When sheet ice develops;
- During ice sheet formation;
- During ice break-up;
- After ice break-up occurs.

Relative to the timing of photographic documentation, FirstLight originally considered conducting the field visits from December 1, 2014 to March 31, 2015. However, VY may not shut down until December 29, 2014, thus ice formation and thickness in early 2015 would not be representative of future baseline conditions given that the thermal impacts may continue in December 2014. Given this, FirstLight proposes to conduct the photographic documentation between December 1, 2015 and March 31, 2016 to reflect baseline conditions.

FirstLight proposes to conduct the CRREL database research and TransCanada impoundment research in early 2015. Using the ice and temperature data, correlations between air temperature and ice would be developed following a similar approach to that which had been utilized to evaluate ice formation, breakup and subsequent erosion on the Platte River (*Analysis of Ice Formation on the Platte River* (Simons & Associates, 1990), *Physical Process Computer Model of Channel Width and Woodland Changes on the North Platte, South Platte and Platte Rivers* (Simons & Associates, 1990), *Calibration of SEDVEG Model Based on Specific Events from Demography Data* (Simon & Associates, 2002)].

This previous work included the development of correlations between air temperature data and ice formation as well as ice break-up. These correlations were developed into algorithms in computer models that simulated, among other processes, the effect of ice formation and breakup on riparian vegetation and erosion. The type of analyses (although not in model form since this model focused only on young vegetation, 0-5 years) would be conducted to analyze ice-related erosion processes on the Turners Falls Impoundment. Another component of the analysis is to evaluate forces that ice transmits to riverbanks and riparian vegetation. Concepts utilized in *Analysis of Bank Erosion at the Skitchwaug Site in the Bellows Falls Pool of the Connecticut River* (Simons & Associates, 1992) will also be applied regarding the forces that ice transmits to riverbanks and the type of damages that occur associated with ice. This analysis of forces will be supplemented by concepts of root strength in RIPROOT, a component of BSTEM (while BSTEM is not set up to evaluate ice, some concepts related to vegetation will be incorporated into an independent analysis of the effects of ice on riverbanks and riparian vegetation). The frequency and duration of ice-related events and associated forces will be incorporated into the analysis based on the correlation between air temperature data and ice formation/breakup.

Thus, the analysis of ice as a cause of erosion will be conducted in two main parts with the first being the data gathering and literature review as outlined above, and the second being the actual analysis which will utilize correlations between air temperature and ice formation/breakup and erosion causing forces of ice on riverbanks and riparian vegetation compared against resisting forces of the strength of vegetation and how ice impacts and disrupts riverbank soils. The frequency and duration of ice forces will be developed based on the correlation between air temperature and ice as previously described.

Given the need for additional data collection during the first full winter following the closure of VY, FirstLight anticipates that the analyses set forth in Task 5, as well as the subsequent study tasks, will be conducted after March 31, 2016, at the conclusion of all field activities.

Per FERC's December 13, 2013 letter, FirstLight requests you provide comments on the proposed addendum to Study No. 3.1.2 within 30 days or by September 11, 2014. If no response is provided by September 11<sup>h</sup>, it is assumed there are no comments.

If you have any questions, please feel free to call me.

Sincerely

A handwritten signature in black ink, appearing to read "John Howard". The signature is written in a cursive style with a large initial "J" and "H".

John Howard