



The State of New Hampshire  
**DEPARTMENT OF ENVIRONMENTAL SERVICES**

**Thomas S. Burack, Commissioner**



July 15, 2013

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington, D.C. 20426

RE: Comments on Updated Proposed Study Plan for FERC No. 1889 (Turners Falls) and 2485 (Northfield Mountain)

Dear Secretary Bose:

The New Hampshire Department of Environmental Services (DES) is responsible for issuing federal Clean Water Act § 401 water quality certifications (401 certifications) in New Hampshire. State statutory authority for issuing 401 certifications is provided in RSA 485-A:12, III. DES is also responsible for establishing and administering surface water quality standards for New Hampshire.

DES has reviewed the Updated Proposed Study Plan filed by FirstLight on June 28, 2013 for the following two hydroelectric projects on the Connecticut River:

Turners Falls Project (FERC No. 1889)  
Northfield Mountain Pumped Storage Project (FERC No. 2485)

Comments on the Updated Proposed Study Plan are attached. Please note that DES also supports the comments submitted by the New Hampshire Fish and Game Department in a letter dated July 11, 2013.

We thank you for the opportunity to comment. Should you have any questions, please do not hesitate to contact either myself (602-271-2983) or Owen David (603-271-0699).

Sincerely,

A handwritten signature in black ink that reads "Gregg Comstock".

Gregg Comstock, P.E.  
Supervisor, Water Quality Planning Section  
New Hampshire Department of Environmental Services

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*July 15, 2013*  
*New Hampshire Department of Environmental Services (NHDES)*  
*Comments on*  
*FirstLight Power Resources (FL)*  
*Updated Proposed Study Plan (PSP) dated June 28, 2013*  
*for*  
*Turner Falls Hydroelectric Project (FERC Project No. 1889) and*  
*Northfield Mountain Pumped Storage Project (FERC Project No. 2485)*

**General**

NHDES Comments:

1. The extent of FirstLight's and TransCanada's study responsibilities downstream of the Vernon dam should be clarified so that study plan responsibilities can be assigned appropriately. It is our understanding at this time that FirstLight's studies extend upstream to the Vernon dam.

2. NHDES requests to be included on any working groups formed to advise any of the following FL proposed studies.

**FL Proposed Study #3.1.1: 2013 Full River Reconnaissance Study**

Relevant NHDES Study Requests: 21c (partially addressed - also see FL PS #3.1.2 and FL PS # 4.1.1).

NHDES Comments:

p. 3-12. Task 4 Develop Maps, Summary Statistics, Evaluation of Conditions, and Analyze Changes in Condition since Implementation of ECP and from 2008 FRR. It is stated that the purpose of these comparisons is to evaluate trends in river bank erosion. NHDES recommends that the study include any changes in operation of the FL Projects during the study period to see if such changes in operation during the study period are related to any apparent trends.

**FL Proposed Study #3.1.2: Northfield Mountain / Turners Falls Operations Impact on Existing Erosion and Potential Bank Instability**

Relevant NHDES Study Requests: 21c (partially addressed - also see FL PS #3.1.1 and FL PS # 4.1.1).

NHDES Comments:

p. 26, Study Goals and Objectives. Consistent with NHDES study request 21c, the objectives of this and/or other studies should address the following:

1. determine how water level fluctuations within the minimum and maximum operating range and discharges from peaking operations at the FL hydroelectric projects contribute to shoreline erosion;
2. identify and determine the effects of shoreline bank erosion and riverbank failure on other resources (i.e. riparian areas and shoreline wetlands, rare plant and animal populations, water quality, aquatic and terrestrial wildlife habitat, etc.);
3. identify techniques that could be used to mitigate the effects of project operations or other mitigation techniques that could be developed to reduce on riverbank erosion within the impoundment and downstream of the tailrace.

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p. 3-33, Task 5d. Field Evaluation - Round 2. For transects in New Hampshire the density of the survey points used to define geometry of the river bank should be specified. The density will need to be quite high to detect changes in riverbank geometry that may be primarily attributable to project operation. In its study request, NHDES proposed installation of horizontal pins into the bank to help measure erosion over the short and long term. If the density of survey points is not considered high enough to detect subtle changes in riverbank geometry, NHDES will likely request that pins be installed at the New Hampshire transects as described in its original study request.

Also, it appears that only one survey of the transects will be taken. Consistent with NHDES study request 21c, NHDES requests that monitoring of bank geometry at transects in New Hampshire be conducted on a biweekly basis to help isolate the potential affects of daily project operation on riverbank erosion and instability.

p. 3-26. Methodology. The study should compare the water elevations due to project operation to the elevation along the riverbanks below which there is a lack of vegetation, undercutting, etc. and determine if there is a correlation. The study should also address the potential of daily project operations making the riverbanks more prone to erosion (i.e., due to lack of vegetation, undercutting, etc.) and how this may impact the frequency and magnitude of massive erosion when high flows occur.

The study should also address how daily project water level fluctuations may impact groundwater levels and movement within the riverbank and the extent to which this may be destabilizing the banks and making them more prone to erosion failure under higher flows.

The analysis should also evaluate how changes in operation of the Projects may affect riverbank erosion along the river.

### **FL Proposed Study #3.2.1: Water Quality Monitoring Study**

Relevant NHDES Study Requests: 25c

NHDES Comments:

p.3-38, General Description of Proposed Study, last paragraph, last sentence. It is stated that FL is not proposing to collect nutrient parameters in the Connecticut River upstream of the Massachusetts border because it is not consistent with MADEP's request and would not provide useful information if collected from a limited area. NHDES disagrees with this statement for the following reasons. The FL project impounds water approximately 5.5 miles in New Hampshire. Operation of the FL projects therefore impacts New Hampshire surface water quality and must not cause or contribute to violations of New Hampshire surface water quality standards. NHDES uses nutrient parameters in its assessment of waters required by EPA and the Clean Water Act [section 305(b) and 303(d)] for determining designated use support such as aquatic life and primary contact recreation. Further, this is not an unreasonable request as TransCanada is proposing to collect this data in all three of its impoundments. Collection of weekly nutrient parameters (total phosphorus, nitrite/nitrate, Kjeldahl nitrogen and chlorophyll-a) at the sampling site in New Hampshire, as described in NHDES study request # 25c, should therefore be included in the proposed study.

p. 3-41, Task 1: Develop Sampling Plan. It is stated that a water quality sampling plan will be submitted to MADEP for approval prior to sampling. A sampling plan (including quality assurance procedures) for the monitoring station in New Hampshire should be submitted to NHDES for approval prior to sampling to ensure

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that data is collected in a manner that can be compared to New Hampshire water quality standards and is of sufficient quality for use in Clean Water Act Section 305(b) / 303(d) assessments.

p. 3-42, Task 3: DO and Temperature Profiles. Weekly profiles should be conducted at the sampling station in New Hampshire as proposed in NHDES study request # 25c to determine if stratification is occurring and the proper depth to set the datalogger. To determine compliance with New Hampshire dissolved oxygen criteria (Env-Wq 1703.07) dataloggers deployed in the impoundment should be set at the bottom of the epilimnion (if stratified) or at 25% depth if not stratified.

**FL Proposed Study #3.2.2: Hydraulic Study of Turners Falls Impoundment, Bypass Reach and below Cabot Station**

Relevant NHDES Study Requests: 14a (this is also covered in FL PS # 3.8.1)

NHDES Comments:

It is our understanding that the model will predict velocities which will be used in other studies. Considering the importance of velocity on erosion, aquatic habitat, etc., NHDES recommends that calibration of the model include comparison of predicted velocities at several cross sections to measured velocities.

**FL Proposed Study 3.3.2: Evaluate Upstream and Downstream Passage of Adult American Shad**

Relevant NHDES Study Requests: 2.

NHDES Comments:

See comments submitted by the New Hampshire Fish and Game Department

**FL Proposed Study #3.3.5: Evaluate Downstream Passage of American Eel**

Relevant NHDES Study Requests: 3

NHDES Comments:

See comments submitted by the New Hampshire Fish and Game Department

**FL Proposed Study #3.3.6: Impact of Project Operations on Shad Spawning, Spawning Habitat and Egg Deposition in the Area of the Northfield Mountain and Turners Falls Projects**

Relevant NHDES Study Requests: 4

NHDES Comments:

See comments submitted by the New Hampshire Fish and Game Department

**FL Proposed Study #3.3.14: Aquatic Habitat Mapping of Turners Falls Impoundment**

Relevant NHDES Study Requests: 15b (this is also covered in FL PS # 3.5.1)

NHDES Comments:

See comments submitted by the New Hampshire Fish and Game Department

**FL Proposed Study #3.5.1: Baseline Inventory of Wetland, Riparian and Littoral Habitat in the Turners Falls Impoundment, and Assessment of Operational Impacts on Special-Status Species**

Relevant NHDES Study Requests: 15b (this is also covered in FL PS # 3.3.14)

NHDES Comments: NHDES requests that the study plan 1) indicate use of field GPS units (with accuracy specified) for mapping, 2) that data will be uploaded and annotated in GIS so that plant species and their distribution are all georeferenced, and 3) that the shapefiles generated from the field work will be shared with resource agencies such as NHDES

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**FL Proposed Study #3.8.1: Evaluate the Impact of Current and Future Modes of Operation on Flow, Water Elevation and Hydropower Generation**

Relevant NHDES Study Requests: 14a (this is also covered in FL PS # 3.2.2)

NHDES Comments:

The study request submitted by NHDES requested that modeling be conducted to evaluate the potential effects of climate-altered flows on project operations over the course of the license. FirstLight's proposal does not address this objective, but should. Given studies such as those by researchers at the University of New Hampshire<sup>1</sup> that show that flood and drought frequency in New Hampshire has changed over the past 40 years, and is very likely to continue to change, climate change scenarios are necessary. Much of this type of modeling is already underway around the state, though not in the Connecticut River. NHDES requests that FL address how they will evaluate the potential effects of climate-altered flows on project operations over the course of the license in their study plan.

One of the objectives in our study request was to compare hourly discharge and water surface elevations at various locations in New Hampshire at current and proposed operating conditions to model results assuming instantaneous run-of-river at the Projects. Running the model assuming instantaneous run-of-river will help place bounds on the possible range of results and provide a relative idea of the sensitivity of the model. NHDES therefore requests that this scenario be run.

**Comments on Study Requests that FL does not Propose to Conduct**

**FL #4.1.1: Study of Shoreline Erosion Caused by Northfield Mountain Pumped Storage Operations**

Relevant NHDES Study Requests: 21c (partially addressed - also see FL PS #3.1.1 and FL PS # 3.1.2).

NHDES Comments:

See comments for FL proposed study 3.1.2 above.

**FL #4.2.2: Climate Change and Continued Project Operations**

Relevant NHDES Study Requests: 27

NHDES Comments:

See comments for FL proposed study 3.8.1 above.

**FL #4.3.1: Shad Population Model for the Connecticut River**

Relevant NHDES Study Requests: 6

NHDES Comments:

See comments submitted by the New Hampshire Fish and Game Department.

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<sup>1</sup> Hayhoe, K., C. P. Wake, T. G. Huntington, L. Luo, M. D. Schwartz, J. Sheffield, E. Wood, B. Anderson and J. Bradbury. 2007. Past and future changes in climate and hydrological indicators in the US Northeast. *Climate Dynamics*, 28(4), 381 - 407.

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