

FEDERAL ENERGY REGULATORY COMMISSION  
WASHINGTON, DC 20426  
December 17, 2019

OFFICE OF ENERGY PROJECTS

Project No. 4678-052–New York  
Crescent Hydroelectric Project

Project No. 4679-049–New York  
Vischer Ferry Hydroelectric Project

New York Power Authority

VIA Electronic Mail

Mr. Robert Daly  
Licensing Manager  
New York Power Authority  
[Robert.Daly@NYPA.gov](mailto:Robert.Daly@NYPA.gov)

**Subject: Staff Comments on the Proposed Study Plan for the Crescent  
Hydroelectric Project and Vischer Ferry Hydroelectric Project**

Dear Mr. Daly:

We have reviewed your proposed study plan for the Crescent Hydroelectric Project (Crescent Project) and Vischer Ferry Hydroelectric Project (Vischer Ferry Project), filed with the Federal Energy Regulatory Commission (Commission) on September 24, 2019. In addition to our verbal comments provided during the October 23, 2019, proposed study plan meeting, we are providing written comments pursuant to section 5.12 of the Commission's regulations. We anticipate that New York Power Authority (NYPA) will take our comments into consideration during development of the revised study plan, which must be filed with the Commission by January 21, 2020.

In the attached Schedule A, we provide comments on proposed studies and four additional information requests. In Schedule B, we request a new study on the potential effects of the Vischer Ferry Project on ice-jam flooding in the lower Mohawk River, in response to the concerns expressed over this issue at the study plan meeting by various stakeholders and in a letter filed by Assemblyman Phil Steck on October 22, 2019.

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We appreciate the opportunity to comment on your proposed study plan for the Crescent and Vischer Ferry Projects. If you have any questions, please contact Jody Callihan at (202) 502-8278, or via email at [jody.callihan@ferc.gov](mailto:jody.callihan@ferc.gov).

Sincerely,

John B. Smith, Chief  
Mid-Atlantic Branch  
Division of Hydropower Licensing

Attachments: Schedule A and Schedule B

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## **SCHEDULE A**

### **Comments on Proposed Study Plan (PSP)**

#### ***Water Quality Study***

1. In the PSP, you state the location of the water quality sampling sites within each project's impoundment and tailwaters will be based on consultation with New York State Department of Environmental Conservation (New York DEC) water quality staff. In the Revised Study Plan (RSP), please provide the results of this consultation, and include a map that shows the approximate locations of your proposed water quality sampling sites. Also, please indicate, in the RSP, the impoundment depth(s) at which you plan to deploy the data sondes that would be used to continuously monitor water temperature and dissolved oxygen (DO).
2. Water quality studies at hydropower projects commonly use 15-minute measurement intervals for continuously recording data sondes (i.e., water temperature and DO data are recorded every 15 minutes). Therefore, in the RSP, please explain why you propose to use a 30-minute rather than a 15-minute measurement interval for continuous measurements of water temperature and DO.
3. At the study plan meeting, there was a discussion of whether to collect water quality grab samples (surface waters) and impoundment depth profiles at weekly rather than monthly intervals (as proposed in the PSP). Therefore, in the RSP, please confirm your proposed sampling frequency (i.e., weekly or monthly) for water quality grab samples and impoundment depth profiles.

#### ***Fish Entrainment Study***

4. You state that an Acoustic Doppler Current Profiler (ADCP) will be used to measure approach velocities in front of the projects' intakes during 'varying operational conditions.' In the RSP, please specify under what operation conditions (e.g., maximum hydraulic capacity of each project) these ADCP measurements would occur.

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5. You propose to estimate turbine survival via a blade strike model.<sup>1</sup> In the RSP, please indicate if you plan on providing separate estimates of turbine survival for each turbine type (Kaplan and Francis) present at the projects.<sup>2</sup>

***Blueback Herring Migration Study***

6. You propose to conduct a single-season hydroacoustic study by placing split-beam transducers<sup>3</sup> at navigation locks E-6 (at the Crescent Project) and E-7 (at the Vischer Ferry Project) to assess the timing, duration, and magnitude of the upstream migration of adult blueback herring through these navigation locks. However, it is unclear how the results from this study would inform potential license conditions or relate to the management goals for blueback herring in the Mohawk River. For instance, is the study meant to provide information on run timing for the purpose of informing decisions as to when the navigation locks should be operated to optimize upstream fish passage? It is also unclear how estimates of run sizes would provide new information for the project record because it is well known that a sizeable spawning run of blueback herring occurs in the Mohawk River as previous fishery surveys upstream of the projects have caught hundreds to thousands of adults in the spring and early summer spawning season (generally May and June).<sup>4,5</sup> Therefore, in the RSP, please specify how the results of your proposed study would inform potential license conditions, provide new information for the project record, and relate to the management goals for blueback herring in the Mohawk River.

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<sup>1</sup> Franke, G.F. and 9 others. Development of environmentally advanced hydropower turbine system design concepts. Idaho National Engineering and Environmental Laboratory, Idaho Falls, Idaho. August 1997.

<sup>2</sup> Each project contains four turbines, two Kaplan units and two Francis units, each of which have the same specifications.

<sup>3</sup> Split-beam transducers send out acoustic signals into the water column and 'listen' for the for return signals. The characteristics of the return signals (amplitude, target strength, etc.) are used to estimate the number of fish in the vicinity of the transducers.

<sup>4</sup>[http://www.asmfc.org/uploads/file/59c2ac1fRiverHerringStockAssessmentUpdateVolu meII\\_State-Specific\\_Aug2017.pdf](http://www.asmfc.org/uploads/file/59c2ac1fRiverHerringStockAssessmentUpdateVolu%20meII_State-Specific_Aug2017.pdf)

<sup>5</sup> Wells, S.M., Limburg, K.E., and C.D. Legard. 2013. Tracking blueback herring in the lower Mohawk River. AFS New York Chapter Meeting. February 2013.

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7. You propose to study only the upstream component of the blueback herring migration in the Mohawk River (as described above) given that a number of previous studies have already evaluated the effectiveness of the downstream passage (acoustic deterrent) systems present at the projects. Although several studies have evaluated the effectiveness of the existing acoustic deterrent systems—which use ultrasonic (high-frequency) sound to divert juvenile and post-spawning adult blueback herring away from the powerhouses and towards surface openings in the projects' flashboards, certain information gaps remain, particularly at the Crescent Project due its more complex channel arrangement (a split channel upstream of the dams) compared to Vischer Ferry (single channel). First, the effectiveness of the acoustic deterrent system for adults at the Crescent Project, which was initially evaluated during a 2009 telemetry study,<sup>6</sup> has not been re-evaluated since the direction of the sound field was changed in 2010.<sup>7</sup> Thus, the effectiveness of the current deployment configuration is largely unknown for adult blueback herring at the Crescent Project. Secondly, despite the re-alignment of the sound field at the Crescent Project, the acoustic deterrent system still appears to be only partially effective at diverting juveniles as the diversion rate<sup>8</sup> in a 2012 study (3 to 27 percent after re-alignment)<sup>9</sup> was similar to that (20 percent) from a 2008 study conducted

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<sup>6</sup> Effect of an ultrasonic system on adult blueback herring at the Crescent Hydroelectric Project: data report. Filed on March 15, 2010. Accession No. 20100315-5011.

<sup>7</sup> The direction of the sound field was changed in 2010 to penetrate farther up the east (non-powerhouse) channel in an attempt to divert more juveniles away from the powerhouse at the Crescent Project.

<sup>8</sup> The 'diversion rate' is the additional proportion of fish estimated to migrate down the east (non-powerhouse) channel due to the presence of the acoustic deterrence system (i.e., the proportion in excess of that expected based on the natural flow allocation between the two, east and west, channels alone in the absence of the sound field). For example, if 85 percent of the flow was down the powerhouse (west) channel, and the remaining 15 percent was down the non-powerhouse (east) channel, and 35 percent of juvenile blueback herring were estimated to move down the east (non-powerhouse) channel when the sound field was on, then the 'diversion rate' would be 20 percent.

<sup>9</sup> Unlike the first (2008) juvenile study, the second (2012) juvenile study calculated diversion rates for *both* the peak migration period (based on fish movement patterns) and entire study period; the 2008 study only included the latter (entire study period). This is why a range is presented for the diversion rates from the 2012 study.

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prior to the re-alignment of the sound field.<sup>10,11</sup> Therefore, if you do not propose studies in the RSP to address these information gaps, please explain why you believe the existing information is sufficient to conclude that the current downstream passage system at the Crescent Project is effective for deterring both juvenile and adult blueback herring away from the project's turbines and passing safely downstream.

### *Aquatic Mesohabitat Study*

8. As part of the Aquatic Mesohabitat Study, you propose to conduct field reconnaissance surveys along the projects' shorelines (littoral zones), in which you would note the occurrence of any freshwater mussels (and shell remains) or fish nests. However, you state that these field reconnaissance surveys would only be performed in areas that lack adequate (existing) aerial imagery data and would be used for the purpose of 'filling in' data gaps to create a comprehensive map of the various mesohabitats (wetlands, riparian, and littoral zones) present at the projects. Given these field surveys may cover a rather limited portion of the shoreline (depending on the quality and extent of existing aerial imagery data), it is unclear how the field component of this study would inform an analysis of potential project effects on freshwater mussels and fish spawning in the projects' impoundments. For instance, water levels in the project impoundments are drawn down 18 to 33 inches in the spring and fall for the purpose of installing and removing flashboards, which could cause desiccation of mussels and disrupt fish spawning activity. Therefore, in the RSP, please clarify how the study would inform potential project effects on mussels and fish spawning in the projects' impoundments.

### *Recreation Study*

9. As part of the Recreation Study, you propose to use either trail cameras or spot counts to conduct use counts (page 41 of the PSP); and either a voluntary, self-administered box survey, or an intercept survey (page 42 of the PSP) to administer the recreation use survey. However, you do not describe the factors you will consider in deciding which method you will use, nor do you include a timeframe for making the decision. As discussed during the study plan meeting, please include in the RSP a description of the process you will use and any factors you will consider when making the determination on whether to use trail or spot counts, and self-administered or

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<sup>10</sup> Dunning, D.J. and C.W.D. Gurshin. 2012. Downriver passage of juvenile blueback herring near an ultrasonic field in the Mohawk River. *North American Journal of Fisheries Management* 32:365-380.

<sup>11</sup> Gurshin, C.W.D., Balge, M.P., M.M. Taylor, and B.E. Lenz. Importance of ultrasonic field direction for guiding juvenile blueback herring past hydroelectric turbines. *North American Journal of Fisheries Management* 34:1242-1258.

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intercept surveys. In your description, please also include a schedule for when these determinations will be made.

10. As part of the Recreation Study, you propose to conduct an inventory and condition assessment “at all non-commercial, public recreation sites that provide recreational access to project lands and waters.” You also state that “the inventory will not include privately-owned recreation sites within and abutting the projects.” As discussed during the study plan meeting, while a condition assessment of these commercial facilities is not necessary, it would be helpful to have an inventory of all the commercial facilities that also provide access to the projects. Therefore, in the RSP, we recommend that you revise the Recreation Facility Inventory description under Task 2 of the Recreation Study (page 40 of the PSP) to include an identification and description of all commercial recreation sites within the study area that also provide access to the projects.

### **Additional Information Requests (AIRs)**

1. Some existing information on the presence and relative abundance of American eel in the vicinity of the projects was compiled and presented in the PAD. However, this information was from non-targeted surveys that were focused on characterizing the general fish community composition in the Mohawk River. During the study plan process, it has become apparent there are additional existing data from targeted eel surveys that have been recently completed in the Mohawk River and would help inform staff’s Study Plan Determination regarding the need for field surveys to determine the relative abundance of American eel in the vicinity of the projects, such as the studies requested by the U.S. Fish and Wildlife Service and New York DEC. Therefore, please provide, in the RSP, the following data reports that were contained in a memorandum distributed by NYPA at the PSP meeting that listed the various documents and reports it has requested from New York DEC:

- USGS. 2015-2016. American eel in tributaries to the Mohawk River. The USGS, SUNY ESF, and DEC screening survey of tributaries for American eel.
- USGS. 2015. American eel *in* USGS Newsletter describing a study being conducted “in cooperation with NYDEC” to determine if American eel are present in the Mohawk River.

Also, at the PSP meeting, Michael Hreben of Kleinschmidt Associates indicated that eel catch data may exist from adult eel collection efforts (years 2009-2010) at the downstream School Street Project (FERC No. 2539) that were conducted to support post-licensing studies of fish passage effectiveness at that project. However, the final reports

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associated with those efforts have not been filed with the Commission.<sup>12</sup> Therefore, if eel catch data (size, relative abundance, etc.) are available from the School Street Project, please provide that data in the RSP, as well as any other existing information regarding the presence, abundance, or distribution of American eel in the vicinity of the Crescent and Vischer Ferry Projects.

2. To inform staff's analysis of existing fish passage opportunities (for eels and blueback herring) afforded by the navigation locks associated with each project (E-6 at the Crescent Project and E-7 at the Vischery Ferry Project), please provide, for the past 10 years, to the extent such data are available, the monthly number of lockages at each project in each year. Also, please specify the hours of the day during which these locks operate.

3. As described above, hydroacoustic studies of juvenile blueback herring were conducted at the Crescent Project in 2008 and 2012. The manuscript reporting the results of the 2008 study included a table (Table 2) of the daily proportion of flow along with the expected and observed proportion of juveniles migrating down the east (non-powerhouse) channel. However, the report for the 2012 study does not contain such data on the daily proportion of flow and expected and observed number of juveniles moving down the east (non-powerhouse) channel. These data are needed by staff to fully interpret the results of the 2012 study—especially the results from the mobile hydroacoustic surveys that were conducted on certain dates for which there is no daily information on the relative flow distribution between the two channels.<sup>13</sup> Therefore, in the RSP, please provide, for the entire duration of the 2012 study (September 8, 2012 through October 26, 2012), the same daily information that was presented in Table 2 for the 2008 study.

4. At the Vischer Ferry Project, there are two separate 'notches' or flashboard openings (sections lacking flashboards) that provide downstream passage of blueback herring, one for juveniles and one for adults. Please clarify whether: (1) both notches are open for the entire duration of the navigation season or (2) if the juvenile notch is initially closed (i.e., its flashboard is in place) until the end of the adult migration season, at which time the adult notch is closed (its flashboard is installed) and the juvenile notch is opened (by removing its flashboard)? If the latter, how much time generally elapses between the

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<sup>12</sup> See letter issued by the Commission on November 14, 2019. Accession No. 20191114-3026.

<sup>13</sup> To evaluate the effectiveness of the sound field in deterring blueback herring, these studies assume that, in the absence of a sound field, blueback herring migrate down each channel in direct proportion to the relative amount of flow down each channel (i.e., follow the bulk flow).



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opening of the juvenile notch and closing of the adult notch (e.g., is this work done on the same day?) and on what dates does this switch generally occur?

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## SCHEDULE B

### Additional Study Request

At the PSP meeting held on October 23, 2019, several stakeholders, including New York Assemblyman Phil Steck, commented that the Vischer Ferry Project exacerbates ice-jam flooding upstream of the project dam, including flooding in the Stockade Historic District. Comments concerning this issue were also filed with the Commission by several stakeholders. After reviewing the pre-application document (PAD), your comments on Scoping Document 1 that also provided supplemental information on flooding, and your proposed study plan, we have identified a gap between the information you provided and the information needed to assess project effects. As required in section 5.9 of the Commission's regulations, we have addressed the seven study request criteria for the study request that follows:

#### Ice-Jam Flooding Study

*Criterion (1) – Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to evaluate any project effects on flooding due to the formation of ice jams in the river reaches upstream of the Vischer Ferry Dam. The specific objectives of the study are as follows:

1. Characterize and understand ice-jam processes in the Mohawk River upstream of the project dam, including ice-jam formation, location of ice jams, and ice-jam-induced flooding.
2. Develop an ice-jam hydraulic model to evaluate the effects, if any, of the Vischer Ferry Project and its operation on ice-jam formation and flooding.
3. Identify structural and nonstructural options for the mitigation of ice-jam impacts if the project is shown to increase flood risk in any part of the study reach.

*Criterion (2) – If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

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*Criterion (3) – If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

Sections 4(e) and 10(a) of the Federal Power Act require that the Commission give equal consideration to all uses of the waterway on which a project is located. When reviewing a proposed action, the Commission must consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values.

Comments provided by the stakeholders indicate that there may be some potential for the project to influence ice-jam flooding upstream of the dam. On August 9, 2019, NYPA filed copies of a flooding study by the New York State Department of Environmental Conservation in 1979, and a flooding study by Gomez and Sullivan for NYPA in 2018. The 1979 flooding study, that included modeling, evaluated the effect the Vischer Ferry Dam has, if any, on flooding conditions under various river flows and under existing and modified conditions at the dam. The study concluded that Vischer Ferry Dam has no significant effect on flooding in Schenectady, New York. Although the report briefly discusses ice-jam flooding, it did not include any analysis or modeling related to ice-jam related flooding. The 2018 flooding study included a modeling analysis to evaluate several Vischer Ferry Dam crest modification options (i.e., lowering crest) on flooding in Schenectady, New York. The modeling included evaluation of these options under a range of flow conditions, and concluded that installing a variable crest control apparatus at the dam and using the most extreme option (i.e., dam crest reduced by 6 feet) would result in minor changes in water surface elevation in the Stockade Historic District under the 10-year flood flow and no significant changes to the water surface elevation or the depth of flooding under the 100-year and 150 percent of 100-year floods.

Both prior modeling studies evaluated dam operation and/or modification options for open-water flooding conditions and did not include hydraulic modeling analysis of ice-jam-induced flooding. Therefore, an analysis of the extent, if any, that the project contributes to ice-jam flooding is needed to identify and balance potential mitigation measures with their costs. As such, the study is relevant to the Commission's public interest determination.

*Criterion (4) – Describe existing information concerning the subject of the study proposal, and the need for additional information.*

The Vischer Ferry Project impoundment extends 10.3 miles from the dam upstream to Lock E-8 in Schenectady, New York. Ice-jam flooding occurs in the low-lying areas along the Mohawk River, particularly in the vicinity of the Stockade Historic District in Schenectady (New York Department of Environmental Conservation, 2018). Ice-jam occurrences in the Stockade area, situated approximately 3 to 4 miles

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downstream of Lock E-8, have been discussed in the published literature (Garver, 2018; Garver, 2014; Garver and Cockburn, 2009). The United States Geological Survey also collects information on water levels and other ice-jam related information as part of the Mohawk River Ice Jam Monitoring Program in this reach of the Mohawk River ([https://www.usgs.gov/centers/ny-water/science/mohawk-river-lock-8-near-schenectady-01354330?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/centers/ny-water/science/mohawk-river-lock-8-near-schenectady-01354330?qt-science_center_objects=0#qt-science_center_objects)).

However, there is no information in the PAD, or in any other documents, that evaluates the potential effects, if any, of the Vischer Ferry Project on ice-jam flooding in this portion of the river. Therefore, a study is needed to formally analyze and evaluate project effects, if any, on ice-jam-induced flooding.

*Criterion (5) – Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

As the project impoundment extends upstream of the areas where ice-jam flooding occurs, water levels in the river along those areas could be affected by project operation. The results of the study would help identify and evaluate the potential effect, if any, of the Vischer Ferry Project on ice-jam-induced flooding and help identify potential measures for alleviating such flooding conditions.

*Criterion (6) – Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

This study should characterize ice jams in the study area, including the frequency and extent/severity of historic ice events, ice-jam formation, location of ice jams, and ice-jam-induced flooding. The study must develop a hydraulic model that can simulate ice jams in the affected areas. The model can be developed using readily available and accepted programs, such as the U.S. Army Corps of Engineers' Hydrologic Engineering Center's River Analysis System (i.e., HEC-RAS). The study area should extend from the project dam to upstream areas where project operation could no longer influence water level in the river. The model should be calibrated for both open-water and ice-jam conditions, which would involve field data collection during actual events. Model simulations should include the analysis for a full range of hydrologic and ice-jam conditions. The study should include an evaluation of various potential structural and nonstructural options for mitigating ice-jam-induced flooding conditions in the upstream areas of the project dam, including changes in project operation leading up to an ice-jam event.

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*Criterion (7) – Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The cost of the Ice-Jam Flooding Study is estimated to range from \$125,000 - \$150,000, including study plan development, field data collection, model development and simulation, mapping, and study report preparation.

### References

New York Department of Environmental Conservation. March 2018. Progress Report, Mohawk River Basin Action Agenda, Environmental Sustainability and Flood Hazard Risk Reduction.

Garver, J. I. March 2018. Ice Jam Flooding on the Lower Mohawk River and the 2018 Mid-winter Ice Jam, Proceedings from the Mohawk Watershed Symposium, Union College, Schenectady, New York.

Garver, J. I. March 2014. Insight from Ice Jams on the Lower Mohawk River, New York, Proceedings of the 2014 Mohawk Watershed Symposium, Union College, Schenectady, New York.

Garver, J. I. and J.M.H. Cockburn. March 2009. A Historical Perspective of Ice Jams on the Lower Mohawk River, Proceedings of the 2009 Mohawk Watershed Symposium, Union College, Schenectady, New York.

Document Content(s)

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