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OFFICE OF ENERGY PROJECTS

Project No. 2570-032  
Racine Hydroelectric Project  
AEP Generation Resources, Inc.

VIA FERC Services

Mr. Jonathan Magalski  
Environmental Specialist Consultant  
American Electric Power Services Corporation  
1 Riverside Plaza  
Columbus, OH 43215

**Reference: Determination on Requests for Study Modifications for the Racine Hydroelectric Project**

Dear Mr. Magalski:

Pursuant to 18 C.F.R. § 5.15 of the Commission's regulations, this letter contains the determination on requests for modifications to the approved study plan for AEP Generation Resource, Inc.'s (AEP Generation Resources) Racine Hydroelectric Project No. 2570 (project). The determination is based on the study criteria set forth in sections 5.9(b) and 5.15(d) and (e) of the Commission's regulations, applicable law, Commission policy and practice, and Commission staff's review of the record of information.

Background

The study plan determination (SPD) for the project was issued on May 13, 2019. AEP Generation Resources filed an initial study report (ISR) on May 5, 2020, held an ISR meeting on May 14, 2020, and filed an ISR meeting summary on June 11, 2020. Comments on the ISR and meeting summary were filed by the West Virginia Department of Natural Resources (West Virginia DNR) on June 5, 2020, the U.S. Fish and Wildlife Service (FWS) on June 30, 2020, the U.S. Army Corps of Engineers (Corps) on July 10,

2020, and the Ohio Department of Natural Resources (Ohio DNR) on August 10, 2020.<sup>1</sup> AEP Generation Resources filed reply comments on August 10, 2020.

### Comments

Some of the comments received do not specifically request modifications to the approved studies or new studies. This determination does not address these types of comments, which include: comments on the presentation of data and results; requests for additional information; or recommendations for protection, mitigation, or enhancement measures. This determination only addresses specific recommendations to modify the approved study plan.

### Study Plan Determination

Pursuant to section 5.15(d) of the Commission's regulations, any proposal to modify a required study must be accompanied by a showing of good cause, and must include a demonstration that: (1) the approved study was not conducted as provided for in the approved study plan; or (2) the study was conducted under anomalous environmental conditions or that environmental conditions have changed in a material way. As specified in section 5.15(e), requests for new information gathering or studies must include a statement explaining: (1) any material change in law or regulations applicable to the information request; (2) why the goals and objectives of the approved study could not be met with the approved study methodology; (3) why the request was not made earlier; (4) significant changes in the project proposal or that significant new information material to the study objectives has become available; and (5) why the new study request satisfies the study criteria in section 5.9(b).

As indicated in Appendix A, the requested modifications to the Water Quality Study are approved. The requested modifications to the Fish Entrainment and Impingement and Recreation studies are approved in part. The requested modifications to the Eastern Spadefoot Study are not approved. The specific modifications to the studies and schedule, and the bases for modifying the study plan are discussed in Appendix B.

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<sup>1</sup> Ohio DNR's letter was sent to AEP Generation Resources, but was not filed with the Commission. AEP Generation Resources appended Ohio DNR's letter to its August 10, 2020 reply comments. On August 17, 2020, staff conducted a teleconference to clarify the recommendations in Ohio DNR's letter.

*Fisheries Survey, Project Characteristics, and Project Operations Related to Potential Fish Passage Study (Fisheries Study)*

During the ISR meeting, AEP Generation Resources proposed to modify the Fisheries Study to eliminate the required spring trawl surveys because: (1) the trawl surveys conducted in the fall of 2019 did not yield any new information on fish populations in the project area; (2) existing trawl data is available from Ohio DNR; and (3) maintaining social distancing while conducting trawl surveys is infeasible. In its comments on the ISR and meeting summary, West Virginia DNR and FWS concur with AEP Generation Resource's proposal to forgo spring trawl surveys. Because no entity objected to these changes during the ISR meeting or in comments on the ISR, these proposed revisions to the Fisheries Study are approved under section 5.15(c)(7) of the Commission's regulations.

Please note that nothing in this determination is intended, in any way, to limit any agency's proper exercise of its independent statutory authority to require additional studies.

If you have any questions, please contact Jay Summers at (202) 502-8764 or via email at [jay.summers@ferc.gov](mailto:jay.summers@ferc.gov).

Sincerely,

Terry L. Turpin  
Director  
Office of Energy Projects

Enclosures: Appendix A – Summary of Determinations on Requested Modifications to Approved Studies  
Appendix B – Staff's Recommendations on Requested Modifications to Approved Studies

**APPENDIX A**

**SUMMARY OF DETERMINATIONS ON REQUESTED MODIFICATIONS TO APPROVED STUDIES** (*see Appendix B for discussion*)

<b>Study</b>	<b>Recommending Entity</b>	<b>Adopted</b>	<b>Adopted with Modifications</b>	<b>Not Adopted</b>
Water Quality Study	West Virginia DNR, FWS, Corps	X		
Fisheries Study	West Virginia DNR, FWS	X		
Fish Entrainment and Impingement Study	West Virginia DNR, FWS		X	
Eastern Spadefoot Study	AEP Generation Resources			X
Recreation Study	West Virginia DNR, FWS, Corps, FERC		X	

## APPENDIX B

### STAFF RECOMMENDATIONS ON REQUESTED MODIFICATIONS TO APPROVED STUDIES

#### Water Quality Study

##### Background

The purpose of the Water Quality Study is to characterize baseline water quality conditions and evaluate potential project effects on water quality in the project area.

AEP Generation Resources, Inc. (AEP Generation Resources) collected continuous water temperature and dissolved oxygen (DO) data from May 1 through October 31, 2019 at the following locations using data loggers: (1) the project intake area; (2) the tailrace; and (3) 4,200 feet downstream of the project.<sup>2</sup> As required by the May 13, 2019 study plan determination (SPD), an additional data logger was installed adjacent to the downstream entrance to the U.S. Army Corps of Engineers' (Corps) Racine Lock at a location approximately 2,000 feet downstream from the Racine Dam. This data logger collected continuous water temperature and DO data from June 14 through October 31, 2019. AEP Generation Resources also collected monthly (from May through October) in-situ water quality data for temperature, DO, pH, and specific conductance at each of the four continuous water quality monitoring locations. Lastly, AEP Generation Resources collected water temperature and DO profile data on a monthly basis from May 1 through October 31, 2019 at three locations upstream of the project.

##### Requested Study Modification

In their comments on the Initial Study Report (ISR) meeting summary, the Corps, U.S. Fish and Wildlife Service (FWS), and West Virginia Department of Natural Resources (West Virginia DNR) state that in 2019 there were extended periods when the project was not operating, and because these extended periods of non-generation coincided with the collection of water quality data, the objectives of the study were not met. FWS also states that because 2019 was atypically dry and hot, the study was conducted under anomalous environmental conditions. For these reasons, the Corps, FWS, and West Virginia DNR recommend that AEP Generation Resources conduct an

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<sup>2</sup> Two data loggers were deployed at each of the water quality monitoring stations to establish a primary and secondary logger to provide backup data in the event the primary logger was lost or malfunctioned.

additional year of continuous water quality monitoring at the four established water quality monitoring locations from July 1 through October 15, at a minimum.<sup>3</sup>

FWS and West Virginia DNR also recommend that AEP Generation Resources consider checking and cleaning the water quality data loggers at a greater frequency. Instead of checking and cleaning the data loggers on a monthly basis, FWS and West Virginia DNR request that the loggers be checked and cleaned on a weekly or bi-weekly basis to reduce biofouling issues.

#### Comments on the Requested Study Modification

In its reply comments, AEP Generation Resources states that it proposes to redeploy continuous water quality data loggers at the project from mid-August through October 15, 2020. AEP Generation Resources further states that although the data loggers would not be installed by July 1, as requested by the agencies, it believes this additional data will sufficiently capture periods of low flow and high water temperatures. Lastly, AEP Generation Resources states that it proposes to conduct bi-weekly maintenance and performance checks on the data loggers to address the concerns with biofouling.

#### Discussion and Staff Recommendation

Regarding whether the Water Quality Study was conducted under anomalous environmental conditions, the hot and dry conditions experienced in the project area in 2019 were appropriate for determining project effects on water quality because reservoir stratification and the potential release of water with low DO concentrations through the powerhouse are most likely to occur under these conditions. Therefore, the environmental conditions experienced in the project area in 2019 do not compromise the validity of this data or, by itself, necessitate the collection of additional water quality data.

However, the ISR indicates that the project was not operating from June 17 through October 7, October 10 through October 12, and October 28 through October 31, 2019, such that the project was off-line approximately 65 percent of the time during the collection of water quality data in 2019. Moreover, the project was offline during the months of July, August, and September, which are typically the hottest months of the

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<sup>3</sup> FWS and West Virginia DNR concur that the reservoir profile data collected in 2019 was collected in accordance with the approved study plan and is valid. Therefore, FWS and West Virginia DNR state that this portion of the Water Quality Study does not need to be repeated.

year, and therefore, the time of year when project operation is most likely to have an adverse effect on water quality. Therefore, the lack of available water quality data during operations over the full study period, especially from July through September, has resulted in inadequate information being produced to evaluate the effects of continued project operation on water quality.

Regarding AEP Generation Resources' proposal to collect continuous water temperature and DO data from mid-August through October 31, 2020, site-specific water quality data would still not be available during periods of project generation from mid-May through mid-August. This data gap would hinder an assessment of project effects on water quality during the summer months when effects on water quality are likely to be most pronounced. To ensure that sufficient data is available to characterize water quality conditions in the project area when the project is operating and support an analysis of project operational effects on this resource during the critical summer months, we recommend that AEP Generation Resources also conduct continuous water quality monitoring from June through August 2021. Additionally, although not addressed in AEP Generation Resources' reply comments, we recommend in-situ water quality measurements also be conducted at each of the four established continuous water quality monitoring locations to achieve consistency with the intent of the approved study plan. Therefore, we recommend that in-situ monitoring occur on a monthly basis and coincide with the timing of all remaining continuous water quality monitoring sampling (September through October 2020, and June through August 2021).

Downloading the water quality data loggers on a bi-weekly basis, as proposed by AEP Generation Resources, would limit the potential for extended periods of lost or inaccurate data resulting from biofouling or lost or malfunctioning loggers by increasing the frequency of data retrieval. We also recommend that AEP Generation Resources conduct bi-weekly maintenance and performance checks on all primary and secondary data loggers associated with the collection of additional water quality data related to this study.

## **Fish Entrainment and Impingement Study**

### Background

The purpose of the Fish Entrainment and Impingement Study is to assess potential project effects on fish mortality and injury using a combination of existing literature and site-specific information. The approved study plan requires a methodology that includes

the following seven separate tasks: (1) formation of a working group;<sup>4</sup> (2) characterizing the physical, operational, and water quality characteristics of the project that may affect fish entrainment, impingement, and survival; (3) collect intake velocity data; (4) developing a target fish species list that includes species of management concern as well as other non-game species (e.g., rare, threatened, and endangered species); (5) using data from tasks 2 through 4 to assess the potential for trash rack exclusion and vulnerability to impingement and entrainment; (6) determining monthly turbine entrainment rates from existing empirical data and utilize these rates to estimate monthly turbine entrainment for the target fish species using existing hydrology and project operations data; and (7) calculating turbine mortality for the range of target species' sizes expected to become entrained and apply this to the monthly entrainment estimates.

In the ISR, AEP Generation Resources states this study has not yet been completed, primarily because a majority of the study's tasks rely on the results of other on-going studies. Therefore, no results for this study have been provided within the timeframe required by the approved study plan. Further, in its reply comments, AEP Generation Resources does not indicate why there has been a delay in reaching an agreement on the specific methodology to be used for the blade strike analysis.

#### Requested Study Modification

West Virginia DNR requests that the Fish Entrainment and Impingement Study be modified to include a provision to use sensor fish technology, as developed by the Department of Energy's Pacific Northwest National Laboratory, to provide site-specific information to improve the accuracy of fish entrainment estimates at the project. West Virginia DNR further states that deploying sensor fish through the project's turbines would provide valuable site-specific data on shear forces, collision potential, pressure changes, and other conditions associated with fish passage through the turbines.

FWS states that it supports West Virginia DNR's request to incorporate the use of sensor fish technology in the Fish Entrainment and Impingement Study. FWS further recommends that task 7 be modified to include a provision to use FWS' Excel-based Turbine Blade Strike Analysis model (Towler and Pica, 2018).<sup>5</sup> FWS states that this requested study modification is necessary to provide a secondary verification of desktop

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<sup>4</sup> Task 1 specifies that the working group include representatives from FWS, West Virginia DNR, and Ohio DNR, and that the purpose of the group is to refine the methods associated with conducting the study within the first year.

<sup>5</sup> Towler, B. and J. Pica. 2018. Turbine Blade Strike Analysis: A Desktop Tool for Estimating Mortality of Fish Entrained in Hydroelectric Turbines. Available at: <https://www.fws.gov/northeast/fisheries/fishpassageengineering.html>.



study survival rates of all species and life stages of fish that may be entrained in the project's turbines and improve the overall accuracy of corresponding annual mortality rates. West Virginia DNR has not specifically commented on FWS' recommendation to modify task 7.

#### Comments on the Requested Study Modification

In its reply comments, AEP Generation Resources cites to section 5.15(d) of the Commission's regulations and states that the resource agencies have not adequately demonstrated that the approved study was: (1) not conducted as provided for in the approved study plan; or (2) conducted under anomalous environmental conditions or that environmental conditions have changed in a material way. Therefore, AEP Generation Resources states that adequate justification to modify the Fish Entrainment and Impingement Study was not provided by the agencies. Accordingly, AEP Generation Resources does not propose to modify this study.

#### Discussion and Staff Recommendation

##### *Sensor Fish*

We previously explained our rationale for not recommending FWS' and West Virginia DNR's prior requests to modify the study to include an in-field verification component in the SPD. In the SPD, we concluded that there was no justification for the added level of cost and effort associated with the agencies' recommendations at that time to incorporate sonar technology into the study methodology to inform the study and validate its results. We also concluded that the approved study would be adequate to provide the necessary information for staff to conduct an analysis of fish entrainment and impingement at the project. Our previous conclusions for not including an in-field verification component with this study remain valid and are equally applicable to FWS' and West Virginia DNR's requests for the use of sensor fish.

##### *Blade Strike Analysis*

As noted above, AEP Generation Resources and FWS have been unable to reach clear agreement in the first study year on the specific methodology to be used for the required blade strike analysis. AEP Generation Resources to date has only stated generally that it will continue to work with the resource agencies to refine the methodologies associated with this study. AEP Generation Resources has neither clearly identified a blade strike methodology for us to consider and weigh against FWS's recommendation nor explained why it does not accept FWS' recommended methodology.

FWS' recommended Excel-based Turbine Blade Strike Analysis model is consistent with generally accepted practice in the scientific community and is a methodology that has been commonly used in other recent relicensing proceedings (e.g., Pejepscot Hydroelectric Project No. 4784, Kelley's Falls Hydroelectric Project No. 3025, and Niagara Hydroelectric Project No. 2466). For these reasons, and to resolve the ongoing disagreement between AEP Generation Resources and FWS on the specific methodology to use for the analysis, we recommend that AEP Generation Resources modify the Fish Entrainment and Impingement Study to remove the provision for AEP Generation Resources to refine the mortality methodology in consultation with resource agencies and replace it with a provision to use FWS' Excel-based Turbine Blade Strike Analysis model to estimate fish mortality through the project's turbines. Because AEP Generation Resources is already proposing, generally, to conduct a blade strike analysis as part of this study, we anticipate no additional cost associated with our recommendation.

## **Eastern Spadefoot Toad Habitat Suitability Assessment**

### Background

The purpose of the Eastern Spadefoot Habitat Suitability Assessment is to determine if eastern spadefoot toad habitat occurs within the project area, and if so, determine if those areas are being used by the eastern spadefoot toad (eastern spadefoot) through a presence/absence field survey. The SPD requires AEP Generation Resources to use soils data, topographic maps, aerial photographs, and other relevant information to determine if suitable eastern spadefoot habitat indicators are present (e.g., sandy soils and flood-prone areas). If suitable eastern spadefoot habitat is found within the project boundary, the SPD requires that a presence/absence field survey be conducted to determine if the eastern spadefoot is making use of project land. The presence/absence component of the study would be conducted based on: (1) the professional opinion of the qualified biologist conducting the habitat assessment; and (2) consultation with Ohio DNR, predicated on data acquired from the habitat assessment.

The results of the habitat survey indicate the presence of moderate-quality eastern spadefoot habitat within the project boundary. Consequently, the biologist that conducted the habitat study concluded that a presence/absence survey is necessary to verify whether the eastern spadefoot is making use of project land.

### Requested Study Modification

AEP Generation Resources requests to modify the study by suspending all remaining field activities, including the presence/absence field survey, due to the

COVID-19 pandemic. AEP Generation Resources further states it will consult with the resource agencies to determine the appropriate steps to take with the study.

#### Comments on the Requested Study Modification

Ohio DNR recommends that AEP Generation Resources conduct the presence/absence survey for the eastern spadefoot.<sup>6</sup>

#### Discussion and Staff Recommendation

Eastern spadefoot habitat has been identified within the project boundary and Ohio DNR has been consulted. The field component of the study can be conducted independently, by a solitary biologist, and in compliance with social distancing protocols. For these reasons, we recommend AEP Generation Resources conduct the presence/absence component of the Eastern Spadefoot Toad Habitat Suitability Assessment, as provided for in the SPD.

### **Recreation Study**

#### Background

The purpose of the Recreation Study is to collect information on current recreation use levels and the condition of the project's recreation facilities. To meet the goals and objectives of the study, the study methodology includes the following tasks: (1) a recreation facility inventory and condition assessment; (2) stakeholder/agency interviews; (3) a visitor use survey consisting of an online survey and on-site survey using a drop-box; and (4) recreation use documentation using trail cameras.

#### Requested Study Modification

West Virginia DNR requests that the Recreation Study be modified to conduct an additional year of visitor use surveys in order to obtain a larger sample size. West Virginia DNR also recommends that AEP Generation Resources consider additional methods for increasing participation in the survey, including newspaper advertisements, social media posts, and incentives for completing the survey.

Ohio DNR requests that the Recreation Study be modified to conduct the visitor use survey for the remaining summer months into Fall of 2020 to increase the sample size of the online surveys and phone interviews, particularly from anglers. Specifically, Ohio DNR recommends expanding participation in the survey through electronic and printed

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<sup>6</sup> See Telephone Memo issued on August 17, 2020.

newspaper advertisements and through social media. Ohio DNR notes that though in-person interviews would be useful, they may not be possible due to the COVID-19 pandemic, and therefore recommends the continued use of a drop box to distribute on-site surveys.

FWS and the Corps support the requests made by West Virginia DNR and Ohio DNR to continue the visitor use survey.

#### Comments on the Requested Study Modification

In its reply comments, AEP Generation Resources states that it completed the study as required by the approved study plan. AEP Generation Resources also states that the data collected and interviews conducted with experienced anglers provide sufficient information to meet the objectives of the study.

#### Discussion and Staff Recommendation

West Virginia DNR, Ohio DNR, FWS and the Corps have not provided the required justification for their requested study plan modifications. Specifically, the agencies did not demonstrate that: (1) the approved study was not conducted as provided for in the approved study plan; or (2) the study was conducted under anomalous environmental conditions or that environmental conditions have changed in a material way. AEP Generation Resources conducted the study using the survey collection methods required by the approved study plan, which did not require a minimum number of survey responses.

However, the survey was conducted under anomalous environmental conditions, (section 5.15(d)). The project was not operating from June 17 through October 7, October 10 through October 12, and October 28 through October 31, 2019, which includes a significant portion of the study season. During these periods, flows were redirected through the Corps' Tainter gates, which are located on the opposite side of the dam from the project's tailrace fishing pier. Because fish were likely attracted to the redirected flows, and therefore were drawn away from the tailrace fishing pier, the quality of fishing at the pier would have likely been reduced during these periods, which may have affected use by anglers. Because the only recreation amenities at the project are the tailrace fishing pier and picnic tables, and fishing is the primary recreation activity, a decrease in site visitation may have occurred due to these anomalous environmental conditions.

For these reasons, we recommend the Recreation Study be modified to continue the visitor use survey, consisting of an online survey and on-site survey using a drop-box,

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and the recreation use documentation using trail cameras from September through October 2020 and June through August 2021.