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Via Electronic Filing

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

Subject: Byllesby-Buck Hydroelectric Project (FERC No. 2514-186)
Supplemental Information/Clarification on the Study Plan Determination

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Licensee), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the Byllesby-Buck Hydroelectric Project (Project No. 2514) (Project or Byllesby-Buck Project), located on the New River in Carroll County, Virginia. The existing license for the Project expires on February 29, 2024, and Appalachian is pursuing a new license for the Project pursuant to the Federal Energy Regulatory Commission's (FERC's or Commission's) Integrated Licensing Process. On October 18, 2019, Appalachian filed the Revised Study Plan (RSP) for the Project. On November 18, 2019 the FERC Director of the Office of Energy Projects issued a Study Plan Determination (SPD). In the SPD, the Director approved the Flow and Bypass Reach Aquatic Habitat Study proposed by Appalachian in the RSP with modifications based on Commission staff's recommendations (Appendix B of the SPD). Appalachian is in agreement with the modifications required by the SPD but notes that staff's description of aspects of this study is inconsistent with that described in the RSP and intended by the Licensee. To avoid potential confusion by Commission staff or other relicensing participants throughout and following execution of this study, Appalachian is providing this clarification.

Commission staff's description in Appendix B of the SPD of the Flow and Bypass Reach Aquatic Habitat Study included the following summary:

> *Appalachian proposes to develop and calibrate a 2-D hydraulic model that would be used in conjunction with an operations model [the Computerized Hydro Electric Operations Planning Software (CHEOPS) platform] to assess how aquatic habitat (depth and flow velocity) in each development's tailrace and bypassed reach varies across a range of flows and project operation scenarios. Hydrology data from the U.S. Geological Survey (USGS) gage (No. 03165500) at Ivanhoe, Virginia (years*

> *1996 through 2019) would be used to develop the CHEOPS model, which is capable of simulating flow releases under various gate opening scenarios. For example, Appalachian plans to use the CHEOPS model to help determine which of the 10 total (six Tainter and four Obermeyer) spillway gates at the Buck Development should be used during down-ramping 1 to ensure a safe, continuously wetted and sufficiently deep, exit route for walleye or other spring-spawning fishes that may be attracted to intermittent spill events into the 4,100-foot-long Buck bypassed reach.2 The results from the hydraulic model would be coupled with a Physical Habitat Simulation (PHABSIM) model to evaluate how aquatic habitat suitability varies as a function of flow for fish species of interest. The species and range of flows (calibration and test flows) to be evaluated at each development (Buck and Byllesby) would be determined through consultation with stakeholders and resource agencies and based on the management objectives for each bypassed reach. Appalachian would also measure leakage into each bypassed reach at the low end of the tested flow regime. Lastly, Wolman pebble counts would be conducted along at least three transects in each bypassed reach to characterize substrate type and size to aid in development of the PHABSIM model.* (p. B-2)

Additionally, the following statement was included in staff's discussion on study requests related to this study:

> *In addition to depth and velocity, substrate type is one of the main input variables for PHABSIM modeling, which Appalachian proposes to use to determine how aquatic habitat suitability varies across a range of flows for fish species of interest. As such, the sediment size data (Wolman pebble counts) proposed to be collected in each bypassed reach is appropriate to inform and develop the PHABSIM model and to characterize existing sediment conditions in the bypassed reach.* (p. B-4)

Contrary to the description provided by Commission staff in Appendix B of the SPD, in the RSP (see Section 4.6), Appalachian did not propose to develop a PHABSIM model for or as part of this study. Instead, Appalachian proposes to develop a two-dimensional (2-D) hydraulic model for each development, to include the tailwater area, bypass reach, and immediate downstream area. The 2-D models will incorporate detailed terrain obtained by topographic mapping technologies and will be capable of simulating observed hydraulic behavior for each study area. The models will be developed using software such as the USACE's HEC-RAS software (version 5.0.3), or the Innovyze ICM software (version 7.0) (or similar computational models), which are capable of simulating depth and velocities in a 2-D grid pattern over a wide range of flow conditions. Flow and water depth data collected as part of the study (as detailed in RSP Section 4.6.3) will be used to calibrate and validate the 2-D hydraulic models to allow simulation of flow

conditions and gate operations other than those that were explicitly sampled during data collection efforts.

The 2-D hydraulic models will be capable of simulating reservoir inflow and rate of reservoir rise, dynamic gate operations scenarios, release travel times, and rates of rise at locations within and downstream of each bypass reach. Analyses of the results of varying spill events and spill configurations are expected to provide insights into potential adverse effects on existing fish and mussel communities or recreational fishing opportunities in the bypass reaches.

The 2-D hydraulic model results will be used to develop a flow and aquatic habitat assessment of each tailwater and bypass reach. For each flow scenario, incremental changes in depth and wetted area will be determined and associated flow patterns and hydraulic connectivity will be evaluated. In addition, substrate and mesohabitat mapping along with the 2-D model depth and velocity simulation results will be used in combination with aquatic species habitat suitability indices (i.e., using depth, velocity, and habitat preferences) to evaluate potential available habitat under each modeled flow scenario in the study reach.

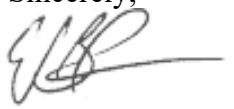
Appalachian is also herein providing the additional information below for Commission staff on the application of the CHEOPS model and why the PHABSIM methodology was not proposed for the Flow and Bypass Reach Aquatic Habitat Study:

- The CHEOPS model was developed for Appalachian to evaluate the effects of operational changes and physical modifications at the Byllesby and Buck developments on power generation. In part, the model uses historical inflows to simulate likely spillway gate operations and the resulting flows in each bypass reach. Results from the CHEOPS model will be used to inform the development of flow test scenarios and 2-D hydraulic model simulations for the Flow and Bypass Reach Aquatic Habitat Study, but will not be used to assess how aquatic habitat (i.e., depth and flow velocity) in each development's tailrace and bypassed reach varies across a range of flows and project operation scenarios. As described above, the 2-D model depth and velocity simulation results will be used in combination with aquatic species habitat suitability indices to evaluate potential available habitat under each modeled flow scenario in each study reach.

- While the PHABSIM model is commonly used for aquatic habitat modeling efforts, the complexity and extent of the Byllesby and Buck study areas are better suited to a 2-D hydraulic model, where multiple bypass flow delivery points can be simulated and hydraulic connectivity throughout the length and width of each bypass reach can be evaluated. In addition, the 2-D hydraulic model will be able to simulate depths, velocities, and flow patterns in the immediate downstream areas where the tailwater and bypass reaches rejoin.

For the reasons stated herein, Appalachian does not intend and is not planning to develop a PHABSIM model for the Flow and Bypass Reach Aquatic Habitat Study. If Commission staff have any questions regarding this clarification or require any additional information, please do not hesitate to contact me at (540) 985-2441 or via email at ebparcell@aep.com.

Sincerely,



Elizabeth Parcell
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