

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

EXELON GENERATION)	PROJECT NO. 405-___
COMPANY, LLC)	(CONOWINGO)

**APPLICATION FOR APPROVAL OF AGREEMENT FOR INCREASE IN
CONSUMPTIVE USE AT PEACH BOTTOM ATOMIC POWER STATION
OF WATER WITHDRAWN FROM PROJECT RESERVOIR**

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the Susquehanna Power Company (“SPCo”) and Philadelphia Electric Power Company (“PEPCo”). *Susquehanna Power Co.*, 19 FERC ¶ 61,348, *order on reh’g*, 13 FERC ¶ 61,132 (1980).¹ Exelon became the licensee on January 1, 2009 per authorization granted in *Susquehanna Power Co.*, 125 FERC ¶ 62,181 (2008). The proposed increase in water consumption use at PBAPS and the minor rise in the allowable amount of water being withdrawn will result in a negligible increase in consumptive use given overall river volume, will have no adverse environmental impacts, has already been approved by the Susquehanna River Basin Commission, and is otherwise consistent with the terms and conditions of Article 13 of the Project license.

II. BACKGROUND AND DESCRIPTION OF PROPOSED USE

In the 1960s, the Philadelphia Electric Company (“PECo”), a predecessor in interest to Operator, proposed, along with Public Service Electric and Gas Company and two other electric utilities, to own and develop jointly nuclear generating facilities at the present site of PBAPS.² The site, on the westerly shore of the Conowingo Pond, already had a small nuclear unit which is no longer in operation. Plans entailed the construction and operation of two additional units, with a rated total nominal capacity of 2,170 megawatts (“MW”) for the combined units. As will be discussed later, the units now are expected to have a jointly rated nominal capacity of 2,720.6 MW by the end of 2015. Operation of the units contemplated the withdrawal of water from the Conowingo Pond

¹ Through an administrative oversight, the order on rehearing was published in the Commission’s official reports prior to the publication of the order issuing the license. The license expired on September 1, 2014. On August 29, 2012, Exelon filed an application for a new license. Thereafter, on September 10, 2014, the Commission issued an order authorizing the Project’s continued operation by Exelon while the Commission considers Exelon’s relicensing application.

² Currently, Operator and PSEG Power LLC, an affiliate of Public Service Electric and Gas Company, are the only owners of PBAPS.

for condenser cooling purposes for the generating units and the construction of three mechanical draft cooling towers. All of these facilities were to be constructed on lands then lying within the project boundary line (“PBL”) of the Conowingo Project. By filling in the shoreline, the then present 110-foot contour would extend approximately 300 feet into the Pond, thereby leaving the nuclear facilities outside of the PBL.

For those purposes, SPCo and PEPCo submitted an application to the Federal Power Commission (“FPC”), the predecessor agency to the Commission in administering the Federal Power Act, for approval of the joint use of the Pond for the construction and operation of the two new units. The application also sought authorization to remove a 26-acre parcel of land so that all of the nuclear units would be outside of the PBL. The licensees’ proposal allowed for the withdrawal of water at a rate of 110 cubic feet per second (“cfs”) of service water and 3,350 cfs of condenser cooling water for a total withdrawal of 3,460 cfs, or 2236.264 mgd. The licensees projected that all water withdrawn would be returned to the Pond except for a varying depletion which would not exceed 38 cfs, or 22.56 mgd. The design of the three cooling towers would cool approximately 58% of the condenser cooling water prior to discharge into the Pond.³

By an order issued in *Susquehanna Power Co.*, 44 FPC 1208 (1970), the FPC approved the change in the PBL and the withdrawal of water for use in the two units. Such authorization was conditioned upon the monitoring and reporting to the FPC of the effects on aquatic resources of the Conowingo Pond and the Susquehanna River from the discharge in terms of chemical, radiological, and thermal changes. The order further

³ The location of the Peach Bottom plant site is depicted on Sheets 4 and 5 of the proposed Exhibit G submitted as part of the application for the new license for the Conowingo Project.

directed that the licensees assure that in the event that it became apparent that modification of the facilities and operations at PBAPS were necessary on the part of PECO in order to preserve or promote optimum ecological conditions in the Pond and the river, “such modifications will be made in due diligence by and at the expense of PECO.” *Id.* at 1209.

Commercial operation of the two new units commenced in 1974. On December 31, 1974, the United States Environmental Protection Agency issued a discharge permit as part of the agency’s National Pollutant Discharge Elimination System (“NPDES”), pursuant to section 402 of the Clean Water Act (“CWA”). 33 U.S.C. § 1342 (2012). The permit included a requirement for closed-cycle cooling, a requirement based, in part, upon the provision for closed-cycle cooling contained in the water quality permit issued by the Commonwealth of Pennsylvania pursuant to section 401 of the CWA. *Id.* § 1341. In lieu of a closed-cycle cooling system, PECO secured approval from the appropriate agencies in Pennsylvania to construct two additional cooling towers, raising the total to five. Construction of the two new towers required the approval of the FPC to the extent that it was necessary to locate 1,450 feet of a 15-foot-diameter submerged pipe on the bed of the Conowingo Pond within the PBL. Further, as operation of those new towers in combination with the previous three would raise the consumptive use of water withdrawn from the Conowingo Pond to 35.5 mgd from the 22.56 mgd previously authorized by the FPC in 1970, that increase in consumptive use also required the FPC’s consent. In an order captioned *Susquehanna Power Co.*, 55 FPC 2607 (1976), the FPC approved the construction of the withdrawal pipe and the increased consumption.

Subsequent to 1976 and following the testing of various cooling operations, the Pennsylvania Department of Environmental Protection (“PADEP”) allowed PECO to discontinue operation of two of the five cooling towers in 2000. The cooling of the condenser water thereafter was achieved by the use of the three remaining cooling towers and the circulation of water in cooling ponds prior to flowing into a 4,700-foot long discharge canal which empties into the Conowingo Pond. Based on tests conducted in compliance with orders of the PADEP, Operator, by then the successor to PECO’s interest in PBAPS, was allowed to rely upon the cooling ponds exclusively, as long as two cooling towers were kept in standby reserve. When Operator renewed its NPDES permit in 2010, the PADEP, as a condition of the new permit, ordered that, from June 15 through September 15 during the period of 2011 to 2014, varying numbers of cooling towers would be required to operate to provide the tower performance and effectiveness as part of thermal variance study under section 316(a) of the CWA. 33 U.S.C. § 1326(a). A copy of the PADEP’s permit issued in 2010 is attached hereto as Appendix B. In compliance with that directive, Operator commenced utilizing cooling towers by gradually increasing the number of towers used each year (i.e., 2010: no towers; 2011: one tower; 2012: two towers; 2013: three towers; and 2014: two towers).⁴

In September 2012, Operator submitted to the Nuclear Regulatory Commission (“NRC”), in Docket Nos. 50-277 and 50-278, an application for an Extended Power Uprate (“EPU”) that would increase the combined rated capacity of the two nuclear generating units to 2720.6 MW. After conducting a thorough review of the application,

⁴ While performing these PADEP required studies of various combinations of generation and cooling tower operations, the consumptive use rose to 35.653 mgd on July 27, 2013 and 37.330 mgd on July 31, 2013. Other than those two occasions, the consumptive use at PBAPS has been within the 35.5 mgd authorized by the 1970 order of the FPC.

which included an analysis of the environmental effects attributable to the implementation of the EPU, the NRC approved Operator's application on August 25, 2014. A copy of the NRC's approval is attached hereto as Appendix C. When completed by the end of 2015, the upgrade in capacity, coupled with the replacement of low-pressure turbines, will result in higher thermal temperatures in the water released from the generating units. Operation of the cooling towers in the warmer months of the year reduces the thermal level of the discharge into the Conowingo Pond. However, the increase in discharge temperatures and the use of the cooling towers will increase the water consumed by the generating plant from the presently authorized 35.5 mgd to at least 44.6 mgd. To provide for some flexibility in the event of contingencies which might result in a consumption level slightly higher than 44.6 mgd, Operator requested and received approval from the PADEP, in the form of a new NPDES permit, and the Susquehanna River Basin Commission ("SRBC") for a peak day consumptive use of 49.000 mgd. The SRBC approved the increased consumptive use on June 23, 2011. The approval was transmitted to Operator by a letter dated July 14, 2011. Copies of that letter and the approval are attached hereto as Appendix D. A new NPDES permit from the PADEP was issued on September 22, 2014 and includes the operating requirements for cooling towers. Copies of that permit and the associated fact sheet are attached hereto as Appendices E and F respectively. Attached also, as Appendix G, is the associated water quality certificate issued by the PADEP on July 23, 2014 under section 401 of the Clean Water Act. 33. U.S.C. § 1341.

In keeping with the approvals of the SRBC, Licensee similarly requests that the Commission approve a maximum peak day consumptive use of 49.000 mgd at PBAPS,

as provided in the proposed Agreement between Licensee and Operator. The increase in consumptive use will not entail construction of any new facilities for the withdrawal of Project waters, as the existing intake facilities are physically capable of providing the water needed for plant operations.

In reviewing the current need to seek authorization from the Commission to increase the consumptive use of water withdrawn from the Conowingo Pond, Exelon also examined compliance with the other aspect of the 1970 Order of the FPC with respect to the amount of water authorized therein for withdrawal per day. That review revealed that since June 2011, or shortly thereafter, PBAPS has increased its water withdrawals from 2236.264 mgd pursuant to the 1970 Order to an amount that cannot exceed 2363.620 mgd pursuant to the June 23, 2011 Order of the SRBC.⁵ Operator has informed Licensee that the use of the 2363.620 mgd provides for an allowance to meet unforeseen contingencies. The increased rate also covers the water needs of the turbine upgrades that had occurred over a number of years, upgrades exclusive of the EPU. A study conducted in 2007 indicated that those upgrades had resulted in water withdrawal needs of 2240.6 mgd, leaving no margin for flexibility in meeting unforeseen contingencies. *See Appendix H, Peach Bottom Through-Screen Velocity at 3 (Sept. 2007).* There is a 5.7% (127 mgd) difference between the withdrawal provided for in the FPC's 1970 authorizing order and the SRBC's allowed withdrawal. Operator's withdrawal records since 2011 show that although it complied with the SRBC approved limit, Operator's mean withdrawal exceeded the Licensee's authorized withdrawal by only 0.747 percent over this four year period. The increase in the maximum daily withdrawal has not resulted in any increase in

⁵ *See Appendix D.*

the approach velocity to the intake screens at PBAPS. That velocity remains at 0.75 feet per second. The through-screen velocity is 1.21 feet per second.⁶

Licensee submits that having matching approvals of the withdrawal number will also provide for symmetry in compliance with the orders of the regulatory agencies. Licensee has added provisions to the Agreement obligating Operator to comply with new limits.⁷ In addition, Operator will adopt operating procedures relating to monitoring, compliance, and reporting to Licensee with regard to such limits. Approval by the Commission of the modest increase in the amount of withdrawal will not require any adjustment or modification of the existing withdrawal facilities, and, therefore, will not cause any disturbance to the lands and waters of the Project.

The consumptive use of Project waters by PBAPS and the modest increase in the daily rate of withdrawal, singularly and when combined with the three other approved consumptive uses of water withdrawn from the Conowingo Pond and the one pending request before the Commission for a new withdrawal and consumptive use, will have negligible environmental effects on either the Conowingo Project or the Susquehanna River.

The City of Baltimore, Maryland (“Baltimore”) and the Chester Water Authority (“Chester”) in Chester County, Pennsylvania are currently authorized to withdraw water from the Conowingo Pond for municipal water supply purposes. Baltimore is authorized to withdraw up to 250 mgd of water from the Reservoir, in accordance with the approval of the FPC issued on August 17, 1960 (unreported). A subsequent order of the

⁶ See Appendix H at 3.

⁷ See Appendix A, Agreement § 7.

Commission approved an amendment to the agreement between Exelon's predecessors in interest and Baltimore on January 13, 1984. *Susquehanna Power Co.*, 26 FERC ¶ 62,008 (1984). In accordance with a settlement agreement between the SRBC and Baltimore, dated September 27, 2001, the city is authorized to withdraw water up to 107 mgd on a peak day (64 mgd as a 30-day average) without providing consumptive use compensation to the SRBC for the withdrawal. *See* SRBC Docket No. 20010801 (Aug. 9, 2001).

Under an initial agreement dated July 9, 1969 between Chester and the then-licensees of the Project, Chester has been withdrawing up to 30 mgd from the Reservoir. Prior to executing that agreement, the SPCo and PEPCo informed the FPC of their intent to allow Chester to use project lands and waters for the purpose of the withdrawal. By a letter dated February 16, 1967, the FPC informed the licensees that it offered no objection to the proposed uses and withdrawal. On November 10, 2014, Chester and Exelon executed a new agreement to supersede the 1969 contract, which was scheduled to expire in 2015. Although the new agreement provides that Chester may seek an increase in the level of withdrawal sometime in the future, subject to appropriate regulatory approval, the authorized rate of withdrawal for now remains at 30 mgd.

Just upstream from PBAPS, Calpine Mid Merit, LLC ("Calpine") operates water intake and discharge facilities to serve the York Energy Center ("Center"), presently consisting of 550 MW of generating capacity. The Center is located in Peach Bottom Township, York County, Pennsylvania. In an order issued in *Susquehanna Power Co.*, 116 FERC ¶ 62,108 (2006), the Commission authorized a withdrawal of water from the Conowingo Pond in the amount of 19.01 mgd to serve the site.⁸ The order approved a

⁸ Conectiv Mid Merit, LLC was the initial owner of what was then called the Delta Power Project.

consumptive use of 8.72 mgd. The withdrawal and consumptive figures were based on the anticipation that the Center would consist of two matched 550 MW power blocks primarily fired by natural gas. However, only one such power block was constructed. Last year, Licensee became aware of plans to increase the generating capacity at the Center and made inquiry to Calpine about any such plans. In response, Calpine has informed Licensee that the Center is being expanded with the installation of an additional 760 MW of generating capacity, but that there will be no increase in the amount of water withdrawn per day or in the daily consumptive use beyond what has been previously authorized.

Presently, Licensee has pending before the Commission an application filed on June 30, 2014, as amended on November 3, 2014, for the withdrawal by Old Dominion Electric Cooperative of 8.7 mgd of water for condenser cooling and other plant purposes for 1,000 MW of new generating capacity known as the Wildcat Project near Rising Sun, Maryland. Of the 8.7 mgd of water withdrawn, 0.8 mgd will be returned to the Conowingo Pond, for a total maximum consumptive use of 7.9 mgd.

Collectively, the currently authorized and maximum proposed consumptive uses of water from the Conowingo Pond amount to 345.62 mgd, or 534.67 cfs. Such amounts will have minimal effect on the flow of water through Conowingo Pond and the Susquehanna River. The average annual flows from the Susquehanna River into the Pond are approximately 39,500 cfs. The lowest seven-day average flow expected to occur every 10 years (“7Q10”) at the Project is 3,785 cfs. The combined existing and proposed consumptive uses represent 1.3% of the river’s average annual flow and 14.4%

Subsequently, Calpine became the owner and renamed the facilities the York Energy Center.

of the flow during the 7Q10. However, as explained in the environmental analysis presented below, the overall effect on the aquatic and terrestrial resources of the Conowingo Project from the increased consumptive use at PBAPS, as well as any variation in the temperature level of the discharge, will be negligible.

III. AGREEMENT TO USE CONOWINGO RESERVOIR

The license for the Conowingo Project contains the standard “Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States,” as Revised October 1975, reported at 54 FPC 1817 (1975). Article 13 of those terms and conditions states in part as follows:

On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing.

Id. at 1821.

Based on the FPC’s authorization in 1970, PECO executed (1) an agreement with the then-licensees governing the terms and conditions for the water withdrawal, and (2) a deed of easement for use of Project lands. With the passage of time and the change in corporate ownership of both PBAPS and the Conowingo Project and recognizing regulatory and factual developments since 1976, most importantly the increase in the consumptive use of water at the nuclear station, Licensee and Operator have concluded

that their contractual relationship should be updated to reflect current regulatory and economic circumstances. Accordingly, Licensee and Operator have drafted the Agreement in Appendix A which contains provisions setting forth, *inter alia*, limitations on the amount of water to be withdrawn, the rate of consumptive use, the payment of compensation for lost generation at the Conowingo Project associated with the consumptive use, and other terms and conditions governing the use of the lands and waters of the Project.

IV. ENVIRONMENTAL ASSESSMENT

The increase in PBAPS's consumptive use of water from 35 mgd to 49 mgd as a result of implementation of the EPU, along with the increase in the maximum daily rate of water withdrawn from the Conowingo Pond, will not have a significant impact on the human environment.

1. Purpose of Action and Need for Project

In accordance with the 1970 order from the FPC, Operator currently uses Conowingo Project lands and waters for the withdrawal and discharge of water as a source of service and cooling water for Units 2 and 3. As previously indicated, the various turbine upgrades, the EPU, and the renewed use of the cooling towers will result in an increased consumptive usage at PBAPS during the warm weather months in an amount that exceeds the 35.5 mgd which the FPC authorized in 1976. In order to allow for that increase in consumptive use and be in compliance with its license obligations, Licensee has entered into a revised Agreement allowing for the increased consumptive use of up to 49.000 mgd, subject to approval by the Commission. The Agreement further provides for a slight increase in the amount of water to be withdrawn daily from the

Conowingo Pond. Operator's increase in consumptive use of water and in the amount of the daily withdrawal will not entail any construction or ground-disturbing activities on Project lands or waters, as the upgrades associated with the EPU will require modifications to the generating equipment at PBAPS, with all such modifications being implemented within existing buildings at PBAPS which lie outside of the Project's boundary line.

Due to the fact that the Conowingo Reservoir already serves as the source of cooling water for PBAPS, and the infrastructure is already constructed and in operation, there are no viable alternatives to the proposal to increase consumptive use of Project waters. As part of its recent proceeding for a renewal of its NPDES permit under CWA section 402, Operator consulted with the PADEP extensively on cooling alternatives for PBAPS under the EPU. As described below, implementation of the EPU will result in an approximately 3°F increase in the combined generating units' discharge temperature at the PBAPS. The parties agreed that sequential operation of up to three cooling towers in the summer months would more than offset temperature increases resulting from the EPU. Operation of these cooling towers during summer months is a direct requirement in the NPDES permit for PBAPS.

Operator also considered the consequences if the EPU was not approved (i.e., the "no action" alternative). Operator concluded that it and other electric power organizations may be required to pursue other means, such as fossil fuel or alternative fuel power generation, to provide electric generation capacity to offset future demand.⁹

⁹ Operator also notes that PBAPS provides firm-fueled generating capacity to the regional transmission system operated by the PJM Interconnection, LLC. In addition, the EPU will expand such firm-fueled capacity consistent with the Commission's efforts to ensure fuel firmness in the markets served by regional

In its environmental assessment of the EPU, the NRC found that the construction and operation of such a fossil-fueled or alternative-fueled plant could create impacts in air quality, land use, water, and waste management significantly greater than those associated with the EPU. *See* Appendix I, Peach Bottom Atomic Power Stations, Units 2 and 3, Environmental Assessment and Finding of No Significant Impact, 79 Fed. Reg. 18,073, 18,082 (Mar. 31, 2014) (“NRC FONSI” or “FONSI”).

2. Consultation and Compliance

The withdrawal of cooling water by PBAPS from the Conowingo Reservoir and consumptive use of that water is regulated by the SRBC. In 2011, Operator received approval from the SRBC to increase its consumptive use of water at PBAPS from 32.49 mgd to 49.00 mgd to implement the EPU.¹⁰ The SRBC concluded that increased consumptive use would have no adverse impacts to area surface water or groundwater withdrawals, and would not adversely influence the present or future use and development of water resources in the basin.¹¹ As required by the SRBC, PBAPS implements a Consumptive Use Mitigation Plan to mitigate consumptive water use at PBAPS during the months of August, September, and October when natural river flows at the U.S. Geological Survey (“USGS”) Marietta gage are less than current license requirements for the Conowingo Project. A copy of the Consumptive Use Mitigation Plan is attached hereto as Appendix J.

transmission organizations and independent system operators. *See generally Centralized Capacity Markets in Regional Transmission Organizations and Independent System Operators and Winter 2013-2014 Operations and Market Performance in Regional Transmission Organizations and Independent System Operators*, 149 FERC ¶ 61,145 (2014) (requiring RTO/ISOs to file reports on the status of their efforts to address fuel assurance issues).

¹⁰ Appendix D at 1.

¹¹ *Id.*

The discharge of wastewater from PBAPS is regulated by the PADEP. Operator received a new NPDES permit from PADEP on August 22, 2014.¹² PBAPS also operates under a variance from section 316(a) of the CWA for its thermal discharge into the Conowingo Reservoir.¹³

As previously noted, the NRC approved Operator's proposal for the EPU on August 25, 2014.¹⁴ Prior to approving the EPU, the NRC issued its environmental assessment and FONSI in March 2014 to assess the environmental impacts of the EPU. The environmental assessment and FONSI concluded that the EPU operation, including increased consumptive use of water, will not significantly affect human health or the natural environment.¹⁵

Operator also consulted with the following other agencies regarding its proposal for the EPU:

- Operator consulted with Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry's Natural Diversity Inventory ("PNDI") regarding the potential presence of rare, threatened, and endangered species and critical habitats that may be affected by the EPU. Copies of relevant online PNDI Project Environmental Review and correspondence from the Bureau of Forestry are attached as part of Appendix K.¹⁶
- Operator consulted with the Pennsylvania Fish and Boat Commission

¹² See Appendix E.

¹³ See *id.*, NPDES Permit at Part C.

¹⁴ See Appendix C.

¹⁵ See Appendix I at 18,082.

¹⁶ See also NRC Supplemental Environmental Report at 40, attached as Appendix L.

(“PFBC”) regarding the potential presence of rare, threatened, and endangered species and critical habitats that may be affected by the EPU. The PFBC concurred with the conclusion of no impacts expected. Copies of relevant correspondence between Operator and PFBC are attached as part of Appendix M.¹⁷

- Operator consulted with the U.S. Fish and Wildlife Service (“USFWS”) regarding the potential presence of rare, threatened, and endangered species and critical habitats that may be affected by the EPU. The USFWS indicated that there will be no impacts to species of concern within its oversight. Copies of relevant correspondence between Exelon and USFWS are attached hereto as Appendix N.¹⁸
- Operator consulted with the Pennsylvania Historic and Museum Commission, Bureau of Historic Preservation (“Bureau”) regarding impacts on historic and archeological resources from the EPU. Copies of relevant correspondence between Operator and the Bureau are attached hereto as Appendix O.¹⁹

3. Geologic Resources

No geologic resources will be adversely impacted by increasing PBAPS’s consumptive use of Conowingo Project waters as a result of the EPU. The proposed change will not require any construction or ground-disturbing activities on Project lands or waters, and will not cause erosion or sedimentation issues. Upgrades associated with the EPU will require plant modifications at PBAPS, but all such modifications will be

¹⁷ See also Appendix L at 41.

¹⁸ See also Appendix L at 40.

¹⁹ See also Appendix L at 28.

implemented within existing buildings at PBAPS, and will not require land disturbance or new construction outside of established facility areas.

4. Water Resources

As noted above, Operator has received approval from the SRBC for increased consumptive use of water at PBAPS, as well as authorizations from the NRC for the EPU and reauthorization of its NPDES permit from PADEP in 2014. In preparing those applications, Operator studied applicable water resources extensively. Based on its studies and discussions with those agencies, Operator anticipates negligible impacts from the increased use of consumptive water or from implementation of the EPU generally, to the water resources of the Susquehanna River or Conowingo Pond.

5. Temperature Impacts

As required by its previous NPDES permit, Operator conducted a four-year thermal study consisting of fish and benthic macro invertebrate community sampling and temperature monitoring in Conowingo Pond during periods without cooling towers (in 2010) and when one (2011), two (2012), and three (2013) cooling towers operated. As part of the temperature monitoring, Operator monitored intake/discharge/in-stream temperatures from 2010 through 2013. Temperatures were also monitored at the outer and inner intake structures, at the head and end of the discharge canal, and at the inlet and outlet for each operating cooling tower to evaluate cooling tower performances.

The thermal study concluded that there will be a maximum 3°F increase in the water temperature from the condensers after the EPU. The study also showed that operation of the cooling towers countered these increases. Each tower cools the discharge by about an additional 1.6°F, measured from the head to the end of the

discharge canal. The study indicated that operation of the towers during the summer months reduces water temperatures in the Conowingo Pond by consistent and measurable amounts within 1.2 miles of the discharge and near the western shoreline.

As a result of the thermal study, Operator and PADEP agreed as part of NPDES negotiations to seasonal operation of PBAPS's three cooling towers to mitigate for thermal plume impacts from the EPU during summer months. The current NPDES permit requires a sequential operation of an increasing number of cooling towers from June 15 to August 31 each year:

Cooling towers shall be operated for the combined operation of PBAPS Units 2 and 3 during the period of June 15 through August 31 each year, according to the sequential order. Average intake temperatures listed below are based on the prior two day rolling average using Unit 2 or Unit 3 circulating water intake temperature instrumentation:

- (1) One tower shall commence operation on June 1 and shall operate continuously through August 31. Should environmental conditions warrant, the Permittee may request that PADEP authorize a delay in commencement of such tower operation.
- (2) A second cooling tower shall commence operation within 48 hours of average intake temperatures being equal to or greater than 83°F. Once operation has commenced, the second tower shall operate continuously through August 31. Should environmental conditions warrant, the Permittee may request that PADEP authorize the termination of the second tower operation prior to August 31.
- (3) A third cooling tower shall commence operation within 48 hours of average intake temperatures being equal to or greater than 86°F. The tower shall operate continuously for seven days, and shall cease operation on the first day, following the seven days, when the average intake temperature is less than 86°F. Thereafter, the third tower shall commence and cease operations when the conditions set forth herein reoccur.²⁰

²⁰ Appendix E at 38.

The thermal study concluded that this sequential operation of cooling towers would reduce water temperatures in the discharge canal to more than offset increases caused by the EPU, as demonstrated in the following table from the PADEP's NPDES Fact Sheet:²¹

Table 19. Temperature Reductions in the Discharge Canal (June 15 to September 15), °F *				
	2010 (No towers)	2011 (One tower)	2012 (Two towers)	2013 (Three towers)
Head of Canal	100.4	98.8	101.1	98.0
End of Canal	100.2	96.8	97.2	93.0
Overall temperature reduction	0.2	2.0	3.9	5.0
Temperature reduction due to cooling tower(s)	0.0	1.8	3.7	4.8
		First Tower	Second Tower	Third Tower
Average temperature reduction per cooling tower	0.0	1.8	1.9	1.6

The NRC FONSI for the EPU also noted an approximately 3°F temperature increase as a result of the EPU. It concluded that the increase in effluent temperature associated with the EPU is not anticipated to alter the aquatic environment.²²

6. Consumptive Water Use

Consumptive water use at PBAPS includes evaporation through the power generation and cooling systems, along with evaporation in the helper cooling towers when the towers are in operation, and evaporation of water withdrawn from Conowingo Reservoir due to thermal loading from water discharged from PBAPS. As a result of the EPU, there will be an approximately 3% increase in the discharge temperature which will be mitigated through operation of the existing cooling towers during warmer months.

²¹ Appendix F at 28.

²² Appendix I at 18,075-76.

The increase in waste heat discharged along with cooling tower operation will increase the amount of water evaporated.

The SRBC approved the increase in consumptive use of water at PBAPS from 35 mgd to 49 mgd. As required by the SRBC, PBAPS implements a Consumptive Use Mitigation Plan to mitigate consumptive water use at PBAPS during the months of August, September, and October when natural river flows at the USGS Marietta gage are less than current flow required by the FERC at the Conowingo Dam. The current Consumptive Use Mitigation Plan trigger values for the months of August, September, and October are the following daily average flow conditions:²³

- 5,000 cfs for August and for the period of September 1 until September 14; and
- 3,500 cfs from September 15 through the end of October.²⁴

Mitigation releases are accounted for by leakage releases from the Conowingo Project. That leakage has previously been determined to be 800 cfs. The Conowingo Project typically requests a leakage credit waiver from the Commission during low-flow conditions to reduce discharges and maintain the reservoir elevation for diverse uses (including hydropower generation, water supply, industrial cooling water, recreational activities and various environmental resources). Under the Consumptive Use Mitigation Plan, Licensee reduces the leakage credit waiver request amount during August, September, and October by 220 cfs during low-flow conditions to provide for PBAPS mitigation.

²³ See SRBC's *Conowingo Pond Management Plan*, Publication No. 242A at 4 (June 2006), available at http://www.srbc.net/pubinfo/techdocs/Publication_242%20%20Conowingo_Mngt_Plan/ConowingoMngmtRpt_LR.pdf.

²⁴ See Appendix J at 1-1.

7. Water Quality

Implementation of the EPU will not require any construction activities on Project lands and waters, so it will not result in groundwater or surface water pollution. Due to the increase in consumptive use, discharge rates to Conowingo Pond will not increase (and will actually decrease). Therefore, as prior studies have demonstrated, there will be no impacts on turbidity, scouring, erosion, or sedimentation as a result of the EPU.²⁵ All plant wastewaters are managed in accordance with the NPDES permit issued by the PADEP. Implementation of the EPU will not increase impacts to Conowingo Pond water quality.²⁶

8. Fishery Resources

Operator also anticipates limited adverse impact from implementation of the EPU to the fishery resources of the Susquehanna River or Conowingo Pond.

As part of the thermal study, Operator conducted a benthic macro invertebrate survey to determine the influence of the thermal plume on the composition and abundance of the benthic community in shallow-water shoreline habitat. During the four years of the study, benthic macro invertebrate sampling was conducted at 10 stations and fish collection was completed using trawl, seine, and boat electro fishing at 30 stations. The study did not analyze impacts to migratory fishes, because prior studies have indicated that there is no thermal blockage to migratory fishes in Conowingo Pond.²⁷

²⁵ See Appendix I at 18,075.

²⁶ *Id.*

²⁷ As a condition of the NPDES permit, however, Operator is required to study the impact of the thermal plume on the outmigration of juvenile shad from October 1 through November 15, to determine if additional cooling is necessary to prevent potential impacts. See Appendix E, Comment/Response Document at 5.

The study concluded that under current licensed thermal power operations of PBAPS, a balanced indigenous community of aquatic species exists in Conowingo Pond. The study also indicated that such an indigenous community will continue to exist in the reservoir after commencement of operations reflecting the completion of the EPU. The study found that the effects on the benthic community resulting from the thermal plume are local and temporary and limited to a small proportion of the available shallow shoreline habitat within Conowingo Pond. These impacts were only observed during July and August when the thermal plume water temperatures were highest, and thereafter recovered. Seasonal operation of the cooling towers under the new NPDES permit, based on average intake temperatures, should reduce these impacts in July and August. There were no differences observed in fish community composition or relative abundance between those areas influenced by the thermal plume, including those areas where the size of the thermal plume was reduced by the operation of the cooling towers, and those areas not influenced by the thermal plume.

Implementation of the EPU will have no effect on fish impingement or entrainment. PBAPS's cooling water intake structure is designed to reduce impingement and entrainment of aquatic organisms. The outer screen structure was designed to have a low-approach velocity to allow fish to avoid the screens. There are 29 trash racks on the face of the outer structure to prevent large debris and ice chunks from entering the intake. There are 24 single entry-single exit traveling water screens (12 per unit) located in the two outer intake structures. Each screen is 10-feet wide with a 3/8-inch square opening

mesh.²⁸ Debris, including fish, is removed from the screens by a high-pressure spray-wash system. The wash water is returned to the reservoir and the debris from the screens is collected and disposed at a permitted landfill offsite. This technology has minimized potential adverse environmental impacts from PBAPS operation of the Peach Bottom station. The EPU itself will not require any modifications to the intake structures, cooling water pumps, or the rate of water withdrawal from Conowingo Pond. Therefore, the EPU will not change the rate of impingement or entrainment of fish, shellfish, or other aquatic organisms.²⁹

9. Terrestrial Resources

The increase in PBAPS's consumptive use of Conowingo Project waters as a part of the EPU is not expected to have any adverse impact to terrestrial resources on Conowingo Project lands or waters, as no construction or ground-disturbing activities are required. The NRC concluded that no land use impacts are anticipated from implementation of the EPU, because no new construction is planned outside the existing facility footprint.³⁰

10. Threatened and Endangered Species

The increase in PBAPS's consumptive use of Conowingo Project waters is not expected to have any adverse impact to rare, threatened, or endangered species or critical habitats. No areas designated by the USFWS as "critical habitat" for endangered species exist at PBAPS. In its Environmental Assessment, the NRC identified two federally listed species that occur in York County, Pennsylvania: the bog turtle (*Glyptemys*

²⁸ See Appendix H at 3.

²⁹ See Appendix I at 18,076.

³⁰ *Id.* at 18,074-75.

muhlenbergii) and the Indiana bat (*Myotis sodalis*). The USFWS has not designated critical habitat for either species. The NRC concluded that because the EPU would not involve any habitat loss or fragmentation or any other significant impacts to the terrestrial environment, the EPU would have no effect on the bog turtle. The NRC also concluded that because the EPU would not disturb or alter any natural habitats on the PBAPS site or along any transmission line corridors, and plant modifications would not result in a significant impact on the terrestrial environment, the EPU would have no effect on the Indiana bat.³¹

11. Aesthetic Resources

The increase in PBAPS's consumptive use of Conowingo Project waters as part of the EPU is not anticipated to have any adverse impact to aesthetic resources at the Project. Upgrades associated with the EPU will require plant modifications at PBAPS, but all such modifications will be implemented within existing buildings at PBAPS, and will not require land disturbance or new construction outside of established facility areas.

12. Cultural Resources

The increase in PBAPS's consumptive use of Conowingo Project waters as part of the EPU is not expected to have any adverse impact to cultural resources. The NRC FONSI noted that no historic or cultural resources have been found within the PBAPS site boundary. The NRC concluded that because there will be no ground disturbance or construction related activities outside of previously disturbed area, there would be no significant impact on historic and archaeological resources.³² Operator consulted with

³¹ *Id.* at 18,077.

³² *Id.* at 18,079.

the Pennsylvania Historic and Museum Commission, which concurred that there will be no impacts to archeological or cultural resources in the area as a result of the EPU.³³

13. Recreation and other Land and Water Resources

The Conowingo Pond provides a number of recreational uses, including animal and nature observation, boating, camping, fishing, picnicking, and sightseeing. The increase in PBAPS's consumptive use of Conowingo Project waters as part of the EPU is not anticipated to have any adverse impact to these recreation uses, as no construction or ground-disturbing activities will be required. Further, the proposed agreement between Licensee and Operator provides that any use of project lands or waters undertaken by Operator shall occur in a manner that will protect the scenic, cultural, recreational, and environmental values of the Conowingo Project and will be consistent with the rules and regulations of the Commission and the requirements and plans contained in the license for the Conowingo Project, including the obligations imposed by Order No. 313 issued by the FPC on December 27, 1965, *Recreation Development at Licensed Projects*, 34 FPC 1546 (1965).

14. Socioeconomic Effects

The increase in PBAPS's consumptive use of Conowingo Project waters as part of the EPU should not have any adverse impact to socioeconomic resources at the Project. Implementation of the EPU at PBAPS will provide significant economic benefits to Pennsylvania and the region. It will increase the electrical output of PBAPS and supply low cost, reliable, and efficient electrical generation to Pennsylvania, the PJM ISO and the region without the need to site and construct new facilities or to impose new sources

³³ See Appendix L at 28 and Appendix O.

of air or water discharges on the environment.³⁴ Operator's payments to engineering and consulting firms, plant equipment suppliers, and local service industries for implementation of the EPU also will have a positive, though temporary impact on local and regional economies.³⁵

V. NECESSARY WATER RIGHTS PURSUANT TO APPLICABLE STATE LAW

As noted above, Operator has received approval from the SRBC for the water withdrawal and consumptive use. Because Operator is not a public water supply agency, no water allocation permit is required under Pennsylvania law. *See* Act of June 24, 1939, P.L. 842 (codified as amended at 32 Pa. Const. Stat. §§ 631-641 (2015)). Licensee possesses water rights to the Susquehanna River obtained from predecessor companies that maintained dams on the river prior to the construction of the Conowingo Project.

VI. STATE OR MUNICIPAL PLANS OR ORDERS

As part of its approval of the increased water consumptive use at PBAPS, the SRBC has found that the proposed use is consistent with the Comprehensive Plan for Management & Development of the Water Resources of the Susquehanna River Basin, and incorporated herein by reference. No state or municipal plans or orders have been adopted with respect to the use of such waters.

³⁴ *See* Appendix L at 9.

³⁵ *Id.* at 16.

VII. COMMUNICATIONS

All service and correspondence concerning this Application should be sent to:

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VIII. CONCLUSION

For the foregoing reasons, Licensee respectfully requests that the Commission approve the agreement between Exelon/Licensee and Operator for the increase in the consumptive use at PBAPS from 35.5 mgd to 49.00 mgd and for water withdrawn from the Conowingo Pond from 2,236.264 mgd to 2,363.620 mgd, all as previously described.

Respectfully submitted,

Exelon Generation Company, LLC

By:

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May 1, 2015

APPENDICES

- A. Agreement between Licensee and Operator
- B. Pennsylvania Department of Environmental Protection NPDES permit: January 1, 2011-May 31, 2015
- C. Nuclear Regulatory Commission Order Approving EPU (August 25, 2014)
- D. Susquehanna River Basin Commission approval of increased consumptive use (July 14, 2011)
- E. Pennsylvania Department of Environmental Protection NPDES permit: October 1, 2014-September 30, 2019
- F. Pennsylvania Department of Environmental Protection NPDES Fact Sheet
- G. Pennsylvania Department of Environmental Protection Water Quality Certification (July 23, 2014)
- H. URS Corporation: Peach Bottom Through-Screen Velocity (Sept. 2007)
- I. NRC Environmental Assessment and FONSI (published March 31, 2014)
- J. Consumptive Use Mitigation Plan (July 27, 2012)
- K. Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry's Natural Diversity Inventory Correspondence
- L. Supplemental Environmental Report in NRC Proceeding
- M. Pennsylvania Fish and Boat Commission Correspondence
- N. U.S. Fish and Wildlife Service Correspondence
- O. Pennsylvania Historic and Museum Commission, Bureau of Historic Preservation Correspondence