

Consumptive Use Application
Amazon Data Services, Inc.
PHL100 Data Center Campus SRBC Pending No.: 2024-056

August 1, 2024

Amazon was granted a 1,600-acre rezoning request on May 30, 2024 on land adjacent Susquehanna Steam Electric Station (“SSES”). Amazon officials said the company hopes to construct 15 data center buildings over the course of the next decade.

Cumulus data center campus owner and nuclear power plant owner Talen Energy agreed to sell the facility to AWS for approximately \$650 million. It is directly connected to the Susquehanna Steam Electric Nuclear Station. Cloud data service provider AWS will install its [hyperscale data center](#) at the site. Talen’s Nautilus crypto data center was not part of the deal with Amazon.

Data centers use significant amounts of water on-site primarily for their cooling system, which comprises cooling towers, chillers, pumps, pipes, heat exchangers, condensers, and computer room air handler (“CRAH”) units. In addition, some computer room air conditioning (“CRAC”) units can be water-cooled, especially in larger installations.

Amazon’s application reads like a generic cookie cutter request. The Application is lacking data and information crucial in order to make an informed decision. The Application raises questions and provides a bare bone sketch of the operation. You don’t spend \$650 million for a pad, and acquire 1,600 acres if there is not going to be build out. As part of the agreement, Talen will continue to supply Amazon with direct access to power produced by its Susquehanna nuclear power plant. This could increase to 960 megawatts in the coming years. You don’t get to 960 mgw with 60,000 gallons per day.

The facility will involve consumptive use of water for evaporative cooling units for Building 2 and Building 3. No consumptive use is anticipated for Building 1. Consumptive use of 0.060 million gallons per day (mgd) (30-day average) is estimated for these operations. Operations for Building 2 which will trigger consumptive use of water are anticipated to begin July 2025. There are no planned outages during the operation of the data center campus. During maintenance, the consumptive and non- consumptive water uses will be the same as during regular operations.

Water for potable and evaporative cooling units will be supplied from the existing Production Well 1. The withdrawal rate from the well is limited to 25 gallons per minute (gpm). Pumped water from the well will be used to fill storage tanks at Building 2 and Building 3 before it is routed to the evaporative cooling units. Water that is not evaporated (bleed/non-consumptive) will be collected and discharged to the existing public sewer connection on site.

Please solicit an opinion from the Public Utility Commission's Law Bureau relating to their overview of the impact of data centers.

Water chemistry and thermal pollution issues need to be addressed up front. Has the applicant performed any studies? Please solicit an impact statement from the Department of Environmental Protection and the Fish and Boat Commission.

This proposal needs to be held in abeyance until Amazon can provide the following information:

- 1) In order to be better informed before making a decision of this magnitude, you ought to have access to land and water use data in order to anticipate the intended bandwidth of this enterprise. It would be prudent to request the status of applications and following documents per condition precedent:
 - Agreement(s) sufficient to provide a minimum of 960MW of power through a power contract with utility providers.
 - Approval of the Sewage Facilities Planning Module between Salem Township and the Department of Environmental Protection.
 - The Department of Environmental Protection and U.S. Army Corps of Engineers approval of any required waterways and wetland encroachment permits.
 - Executed capacity/extension agreements from all required utility companies – water, sewer, gas & electric power.
 - Soil Erosion & Sedimentation Control Plan and NPDES Permit approval by the Luzerne County Conservation District.

- 2) The Request is for Building 1 and Building 2, but water is not anticipated for Building 3. What if Building 3 needs water? These seems like a bad episode of “Let’s Make A Deal.” The Application does not address whether what’s behind the curtain in Building 3 can be retrofitted, and require additional water. This request should not be judged in isolation. Is this request for three buildings associated with 120 mgw?

The SRBC has to determine the correlation between mgw for current and future water uses.

- 3) Amazon is initially planning for 15 +/- buildings. The SRBC should review the documents above to determine the amount of water needed for 15 buildings and 960 megawatts.

If 60,000 gallons is need for 102 megawatts, then by the time Amazon amps to 960 mgw, will they require 300 million gallons per day? It is reasonable for the Commission to request what the future water demand will be.

- 4) PJM has also determined that any load addition in excess of 480 MW would result in generation deliverability violations and require installation of system upgrades, at Susquehanna’s expense, necessary to mitigate these violations in order to ensure system reliability.

Has Amazon made the same commitment with the SRBC?

- 5) Most data center operators fail to monitor water usage. The Uptime survey found that more than 60% say there is no “business justification” to collect that information. The situation may be changing as a growing number of municipalities will permit new data center developments, but only if they are designed to minimize direct water consumption

Will the SRBC ask Amazon to monitor water usage?

- 6) If a data center operator is evaluating a new site or expanding an existing facility, one of the first steps should involve a water balance study. As Black & Veatch explains on its website document, “[Water Management for Data Centers](#),” such a study would evaluate the data center’s water demand, and asses all possible sources, including surface water, groundwater, brackish water, seawater, reclaimed water, and other types. The study should also consider climate, data center design, the possible cooling systems, the use of reclaimed or recycled water, and treating or using reclaimed effluent or discharge water. (1)

Has Amazon conducted a water balance study?

- 7) What goes into the data center as cooling water must then come out — which provides civil engineers the opportunity to design wastewater systems for these facilities. Data centers generate two main types of wastewater effluents: domestic wastewater and cooling effluent, which are discharged to the water utility’s sewer system. The domestic wastewater represents a relatively limited flow, as it comes from an on-site area.

1 “American Society of Civil Engineers.” “Engineers often need a lot of water to keep data centers cool, March 4, 2024.

Cooling effluents are the largest share of this wastewater, representing primarily the condensates from the cooling system. The water is used cyclically in the cooling process, and the effluent often concentrates certain pollutants such as total dissolved solids and chloride, which are not normally targeted for removal by municipal wastewater treatment plants.

Who will monitor the effluent discharges?

“The Amended Susquehanna ISA creates an arrangement where a large data center will be, as a matter of contract, provided with energy from a unit at the Susquehanna nuclear facility, purportedly without any use of the transmission grid because the physical interconnection is to facilities “behind” the point of generator interconnection. The application refers to the data center as “Co-Located Load”, meaning that it is located proximate to the two Susquehanna nuclear units and that its interconnection with the grid occurs through facilities owned by Talen that are also used to interconnect Susquehanna rather than being separately interconnected to the grid through a different substation or even to facilities at Susquehanna that are owned by PPL. This arrangement nonetheless relies on the transmission grid in numerous ways, and its purported independence from the grid is a fiction. Condoning this fiction is a danger to grid reliability and will unjustly shift the very real costs of the grid from one user to others. The application suggests that more such arrangements are likely, and I am aware that similar arrangements are in process—so this proceeding will serve as important precedent concerning whether the Commission will allow cost avoidance through such arrangements.” (AEP & Exelon Brief.)

This is a precedent setting agreement. The water-energy nexus is the relationship between the water used for energy production. There will be many other data centers coming to our region. Will we treat data centers in isolation or look or we will view this centers in aggregate and require backup water regimes, i.e., pooled asset model.

These questions are relevant and timely in light of the proposed modifications to the SRBC’s Review and Approval of Projects.

Project sponsors proposing new or significantly modified power generation plants in the basin shall consider the use of dry cooling technologies and submit to the Commission a rigorous alternatives analysis. This analysis shall include evaluation of the costs, benefits, trade-offs and drawbacks of various cooling and water conservation techniques, and a full evaluation of options for providing effective consumptive use mitigation.

Respectfully submitted,

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