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Mr. Andrew M. Condlin

1519 Summit Avenue, Suite 102

Richmond, Virginia 23230

RE: Data Center Closed Loop Cooling

Dear Mr. Condlin

The following information is provided solely as planning information based on industry standards and our recent experience in water and wastewater infrastructure support for data centers in Virginia. Actual water and wastewater demands for any future development may vary based on the end user, cooling technology, selected equipment, operational characteristics, phasing, and final design configuration. For a data center project exclusively using a closed loop cooling system with a 600 MW capacity, approximate water/sewer figures are as follows:

1. For closed loop cooling, the initial fill on average could use approximately 5,000 gallons/MW. At a maximum of 600MW for a project with 9 buildings, each building could account for approximately 333,333 gallons for the initial fill of a closed loop cooling system, which can be done over the course of multiple days. The actual volume will depend on the cooling equipment manufacturer's commissioning requirements. Closed loop cooling systems generally require minimal makeup water after the initial fill. Our understanding is these systems are designed to run for multiple years without the need to drain/flush.
2. Domestic water/sewer use for data centers is approximately 50 GPD/MW on average and varies depending on staffing levels. A project with a maximum of 600 MW, could result in roughly 30,000 GPD on average. They are typically staffed 24/7 so the demand curve is generally flat, so a peaking factor of 1.5-2.0 could be used to calculate maximum day demands. Additional water for landscape irrigation is site dependent and is estimated at 30-40,000 GPD for a total domestic water demand of 70,00GPD.

These estimates are for planning purposes.

Respectfully,

Robert G Roop, PE



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