



County of Fairfax, Virginia

MEMORANDUM

DATE: July 12, 2024

TO: Fairfax County Board of Supervisors (BOS)

FROM: Larry Zaragoza, DEnv, Chair *Larry Zaragoza*
Environmental Quality Advisory Council (EQAC)

SUBJECT: Comment on the May 17, 2024 Draft Zoning Ordinance Amendment for Data Centers

The Environmental Quality Advisory Council (EQAC) has reviewed the draft Zoning Ordinance and supporting materials for data centers and has a number of comments to offer.

Table 1 summarizes concerns and EQAC recommendations. Huge energy demands of data centers jeopardize renewable energy goals. The issues associated with data centers have been organized into two categories:

1. Impacts that are addressed in the draft ordinance.
2. Impacts that are not addressed in the draft ordinance, presumably because they cannot or should not be addressed in this ordinance.

While Table 1 highlights issues and recommendations, some issues should be highlighted.

1. While the draft zoning ordinance is not the appropriate vehicle to address the climate and energy impacts of data centers, data centers are now threatening both meeting state and county renewable energy goals and even the availability of energy for all customers.
2. While the January staff report does not recognize the potential impacts of data centers on water availability, if hyperscale data centers employ evaporative cooling, the water demands of projected data centers in Northern Virginia may well threaten our water supply, especially during a severe drought or contamination of the Potomac.
3. While ordinances like the landscaping ordinance are reasonable for most development, data centers pose some characteristics that are different from most development. In particular, the noise associated with emergency operations that would be exempt from county noise limits and state emissions limits. Moreover, the distance of only 200 feet for a 75-foot-tall data center would have a significant transition in height and tall and impose significant noise, and possibly air pollution impacts, especially when providing energy through dozens of onsite generators. For this reason, distances of at least 500 feet between residential properties and the closest building, substation, or other equipment should be provided. Smaller buffers would seem appropriate for data centers that reduce peak noise. Thus, the size of the data center and associated impacts should be considered in siting decisions. The use of type and number of diesel generators, and building height should be considered in siting decisions. EQAC also recommends that the noise ordinance be reviewed.

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4. Given the concerns about the adequacy of the noise standard, exemptions for emergency operations, impacts to sensitive environments, and impacts such as water security and maintaining sufficient energy to support existing power users, additional zoning restrictions should be considered.

In developing these recommendations, EQAC appreciates that the Board of Supervisors seeks to lower the tax burden on residential property owners and data centers could provide a significant source of additional revenue. However, EQAC also believes that data centers can be constructed without significant negative impacts on people or the environment. Many of the major information technology corporations that purchase or rent data centers have admirable environmental goals that are consistent with the recommendations that EQAC is providing. EQAC recommends that the county should seek to work with data centers, residents, and the commercial sector to set standards and practices that will attract some data centers and avoid impacting residents and the commercial sector. Attracting data centers to the county may require some incentives and EQAC supports providing data centers incentives if the incentives and data center siting decisions do not adversely impact communities, water supplies or climate goals.

cc: Bryan J. Hill, County Executive
John Morrill, Acting Director, Office of Environmental and Energy Coordination
Christopher Herrington, Director, Department of Public Works and Environmental Services (DPWES)
Tracy Strunk, Director, Department of Planning and Development (DPD)
Carmen Bishop, Deputy Zoning Administrator
Bill Hicks, Director, Land Development Services (LDS)
Matthew Hansen, Director, Site Development and Inspections Division, LDS
EQAC

Attachment: Table

Table 1. Draft Ordinance Requirements and EQAC Recommendations

Issue	Draft Ordinance	EQAC Recommendation
Comments on Issues Addressed in the Draft Ordinance		
Limited Water	The draft ordinance does not recognize that data centers using evaporative cooling could place excessive stress on the region's water supply during drought conditions.	County staff, Fairfax Water staff and the Director of the ICPRB have provided EQAC with information on water. The region can be stressed for water during droughts so that additional water sources have been in planning for years to avoid shortages. EQAC recommends that evaporative cooling for data centers be accepted only if (1) the data center accepts a water supply agreement that is interruptible in times of declared drought, or (2) the data center arranges for an adequate supply of reclaimed water from a source such as the Noman Cole wastewater treatment plant. Note that either the lower flow of fresh water or the blowdown from data centers could increase the levels of salts and minerals into Pohick Creek, which is a fresh-water body.
Noise and Pollution from Emergency Operations	The draft ordinance does not address noise from emergency operations prompted by a brownout.	Should the region be stressed for electricity or transmission, brownouts could result. Brownouts would trigger the use of onsite generators whose emissions would be exempt from state air emissions. Limits and noise would be exempt from the county noise ordinance. These generators could operate for long periods all day and night for weeks/months.
Water Quality	While the draft ordinance does not require pretreatment of wastewater from data centers.	EQAC recommends data centers with evaporative cooling not be permitted to discharge salt-laden "blowdown" to the Occoquan water supply. (Note: The Upper Occoquan WWTP will NOT remove salt!) EQAC recommends that any blowdown be sent to a wastewater treatment facility and that it adheres to any pretreatment requirements. EQAC recommends that

		pretreatment not allow for dilution to be allowed as a method for pretreatment.
Noise Study	The draft ordinance includes the conduct of noise studies for both by right and SE before site plan approval and post construction.	EQAC recommends that additional noise studies, which would characterize noise levels near facilities, be conducted if there are noise complaints.
Equipment Enclosure	The draft ordinance calls for enclosure of HVAC and generators. The Director can waive equipment enclosure when it is not mechanically feasible to do so.	EQAC recommends that the ability to waive enclosure requirements should be limited to situations where equipment manufacturers recommend against enclosure and the applicant has taken steps to reduce noise to levels that are less than the noise that would be expected if the equipment were enclosed.
Industrial areas close to neighborhoods	Any data center building, equipment for cooling, ventilating, or otherwise operating the facility, power generator, or other power supply equipment must be located at least 200 feet from the lot line of an R district or a property developed with a residential use. A lesser distance may be allowed with special exception approval in accordance with subsection 8100.3. For the purpose of this provision, an R district does not include an area within a public street right-of-way. [option for a minimum distance up to 500 feet, and for a different distance within the 500-foot limit for I-5 and I-6 than other districts]	<p>In the absence of an update to the noise ordinance that reduces noise impacts to residents, EQAC recommends that the County adopt 500 feet, the upper end of the advertised range, as the minimum distance. Data centers are best clustered and not located adjacent to residential communities.</p> <p>The potential for large numbers of diesel generators that can run for long periods may be the greatest concern of communities. Enclosure and use of best available technology for generators and air conditioning equipment will help to reduce impacts. For large buildings that are dedicated to serve a data center, 200 feet of separation, possibly less under special exception, seems to provide inadequate separation especially if there are dozens of generators that could operate for long periods of time and exceed noise ordinance levels during an emergency.</p>

Locating data centers at least a half mile from Metro stations	The draft requires that a data center building must be located at least a half-mile from a Metro station entrance.	EQAC recommends increasing the minimum distance of a data center from a Metro or train station to 2 miles because locations close to Metro or train stations should be used for Smart Growth development.
Clustering of Data Centers	The draft ordinance encourages the placement of data centers in industrial zones.	Data centers, especially hyperscale data centers, need substantial power, substations, data cables and other requirements. Co-locating these data centers can be helpful by providing the infrastructure that will be needed and help to reduce resident concerns about data centers to the extent that they can be located away from residential areas.
Impacts to waterways and Resource Protection Areas	The draft ordinance does not address running utilities in or in the vicinity of Resource Protection Areas. The noise impacts of data centers, especially emergency operations would also impact wildlife.	Because waterways and Resource Protection Areas are critical habitat areas within the county EQAC recommends 1) siting data centers within 500 feet of a Resource Protection Area that the application must undergo a special exception review and 2) processes should be put in place to minimize the placement of utility lines through Resource Protection Areas.
Bird safe windows	The draft ordinance does not address bird-safe windows.	All windows, including faux windows, in data centers should be designed as bird-safe windows.
Issues that do not Appear to Fit in the Ordinance but Require Attention (outside of the scope of the data center ordinance)		
Issue	Recommendation	
Threat to Meeting Renewable Energy Targets	The draft Zoning Ordinance does not address the impact of data center growth on renewable energy targets, but background discussion recognizes that renewable energy targets may be referenced in the Comprehensive Plan, which is currently under review. EQAC recognizes that the energy demands of data centers have grown to over 20 percent of the state's total utilization and continues to grow with new data centers.	
Threat of Brownouts	EQAC recommends that the county coordinate with Dominion Energy and neighboring localities to ensure that the regional electrical grid can accommodate the future demands of data centers.	

	EQAC also recommends that the county adopt policies that require renewable energy (e.g., solar panels) in parking lots and on buildings to reduce the need for Virginia to bring more fossil fuel plants online.
Noise Ordinance Update	EQAC recommends that the county review and update the county's noise ordinance to prevent degradation of the quality of life to nearby populations. While everyday noise from a data center may be a concern, the greater threat EQAC recommends that the county adopt a stricter standard considering EPA's recommendation of a 55 dB (day-night sound levels) average upper limit noise limit for outdoor residential areas. ¹
Energy Efficient Building Standards	<p>Given the exceptional energy consumption by data centers, EQAC recommends that the county consider adoption of a more stringent LEED, probably Platinum, or equivalent standard. The standards should address building design; interior design; and operation and maintenance designs. Standards should be updated as standards appropriate to data centers change.</p> <p>With the new building code, data centers are now subject to the ASHRAE energy efficiency standards. Projects that undergo rezoning or special exception review typically proffer or have development conditions relating to LEED, in accordance with Comprehensive Plan policies.</p>

¹ EPA recommends levels of 55 dB over longer averaging periods for outdoor residential areas. The current county standard is 65 dB, which is close to the 70 dB that is associated with hearing impairment. See:

[EPA NSCEP Protective Noise Levels Condensed Version Of EPA Levels Document](#)