

Shelby County Health Department  
Air Pollution Control Section  
814 Jefferson Avenue  
Memphis, TN 38105

*Submitted via web submission [<https://shelbytnhealth.commentinput.com/>]*

April 30, 2025

**RE: Public Comment on Construction Permit No. 01156-01PC – Colossus Data Center  
(CTC Property LLC)**

To Whom It May Concern:

The Southern Alliance for Clean Energy (SACE) is a nonprofit organization that promotes responsible and equitable energy choices to ensure clean, safe, and healthy communities throughout the Southeast. In Memphis in recent years, we have worked with MLGW to redesign the Share the Pennies home weatherization program, and served on MLGW's Power Supply Advisory Team and the Mid-South Priority Climate Action Plan Technical Advisory Committee.

SACE strongly opposes the proposed air pollution control construction permit for the Colossus Data Center. This permit would authorize the permanent operation of 15 methane gas-fired turbines totaling nearly 250 megawatts of on-site fossil fuel generation capacity. Some of these turbines are already installed and in use based on a questionable assertion of temporary use, and this permit seeks to authorize their long term operation 24 hours per day, 365 days per year.

The long term use of these methane gas fired turbines would add a large and completely avoidable source of dangerous air pollution that would harm the health of local residents.

On these grounds, the Shelby County Health Department should reject this permit application. Additionally, given the [recent investigations](#) by the Southern Environmental Law Center demonstrating that xAI's unpermitted gas turbines that are currently running

are apparently the largest industrial source of nitrogen oxides pollution in the county, which would be in violation of the Clean Air Act, the Department must immediately halt the operation of the unpermitted gas turbines and ensure legal compliance before any future operation can resume.

Granting this permit - especially after the lack of transparency from xAI and the apparently illegal polluting of the community - would undermine public trust, regulatory integrity, and environmental and public health protections.

**Our concerns are as follows:**

1. The gas turbines' pollution is completely avoidable with reasonable planning and it is irresponsible to force local residents to absorb the environmental and public health burdens resulting from a private entity's refusal to conduct adequate planning
2. The NO<sub>x</sub> pollution from the gas turbines would pile health harm onto the already existing hazardous state of Shelby County's ozone air pollution
3. The actual pollution during operation may exceed minor source limits
4. There are apparent factual errors in permit materials
5. The applicant's environmental justice analysis is inadequate
6. The public has been limited access to permit application material

**1. The gas turbines' pollution is completely avoidable with reasonable planning and it irresponsible to force local residents to absorb the environmental and public health burdens resulting from a private entity's refusal to conduct adequate planning**

The applicant claims in the permit application that the operation of the on-site gas turbines is necessary because the existing grid infrastructure does not currently provide sufficient capacity to meet the facility's demands. However, this shortfall should have been identified and resolved prior to construction and equipment installation - not after the fact. Running large methane gas-burning turbines on site to meet the facility's 24/7 electrical requirements, rather than relying on power from MLGW, TVA, or self-generation of renewable energy, is a completely avoidable and unnecessary cause of local air pollution that is harming the nearby community. It is unreasonable for the Health Department to grant air pollution permits on a going-forward basis to lock in many years of pollution from unnecessary gas generators when alternative means of powering the facility are available with a reasonable amount of lead time. It is

irresponsible to force local residents to absorb the environmental and public health burdens resulting from a private entity's unwillingness to conduct adequate planning. Shelby County residents should not be made to suffer the consequences of corporate haste or infrastructure gaps that should have been addressed in the predevelopment phase.

Adding insult to injury is the fact that xAI has profited handsomely by quickly scaling up their operations at the Colossus data center, while Memphis residents have paid the price with contaminated air. xAI [brags](#) on their website that their construction process for the facility goes "*further, faster*" and at an "*unprecedented scale*." "*We were told it would take 24 months to build. So we took the project into our own hands, questioned everything, removed whatever was unnecessary, and accomplished our goal in four months [...] We doubled our compute at an unprecedented rate, [...] and no one has come close to building at this magnitude and speed.*" This quick scaling helped xAI raise [\\$6 billion in capital investment](#). Meanwhile, what they're not saying is that questioning "everything" and removing whatever was "unnecessary" meant cutting corners and exploiting loopholes, connecting horribly polluting and inefficient power sources rather than getting grid power infrastructure in place properly like any other business would be required to do, and becoming perhaps the biggest nitrogen oxide polluter in the county.

## **2. The NO<sub>x</sub> pollution from the gas turbines would pile health harm onto the already existing hazardous state of Shelby County's air pollution**

The air pollution permit would allow 87 tons of nitrogen oxides (NO<sub>x</sub>) pollution per year. This would be one of the largest industrial sources of NO<sub>x</sub> pollution in Shelby County, according to the Environmental Protection Agency's [National Emissions Inventory](#).

The study of NO<sub>x</sub> health impacts has increased in recent years, and it received special focus in the American Lung Association's State of the Air report this year. The supplement report "[Something in the Air - Nitrogen Dioxide and Community Health](#)" notes that NO<sub>x</sub> is under-monitored and under-regulated.

NO<sub>2</sub> is the most prevalent form of the group of nitrogen oxides (NO<sub>x</sub>). It is produced when methane gas is burned, causing nitrogen and oxygen in the air to react. From the report, "NO<sub>2</sub> causes a range of harmful effects on the human body, acting mainly as an irritant affecting the mucosa of the eyes, nose, throat and respiratory tract.

Individuals with asthma, chronic obstructive pulmonary disease (COPD), cardiovascular disease and diabetes face greater risks from NO<sub>2</sub> exposure, as studies show *clear links between pollution and increased emergency room visits, respiratory distress and worsened chronic disease outcomes* (EPA, 2008)." (p. 3 of the ALA supplement, emphasis added) The study also notes that "Children, the elderly, individuals with preexisting health conditions and outdoor workers are particularly vulnerable to NO<sub>2</sub> exposure (EPA, 2011)." (p. 4 of the ALA supplement)

Also from the study, and noting that the neighboring community would be subject to prolonged, chronic exposure levels:

"Short-term exposure to NO<sub>2</sub>, lasting from 30 minutes to 24 hours, poses significant health risks, *particularly for communities already experiencing elevated pollution burdens*. It has been scientifically linked to airway inflammation in healthy individuals and worsened respiratory symptoms in people with asthma. Even low-level NO<sub>2</sub> exposure may lead to decreased lung function in COPD patients, increased bronchial reactivity in people with asthma and a higher risk of respiratory infections, especially in young children." (pp. 3 and 4 of ALA supplement, emphasis added)

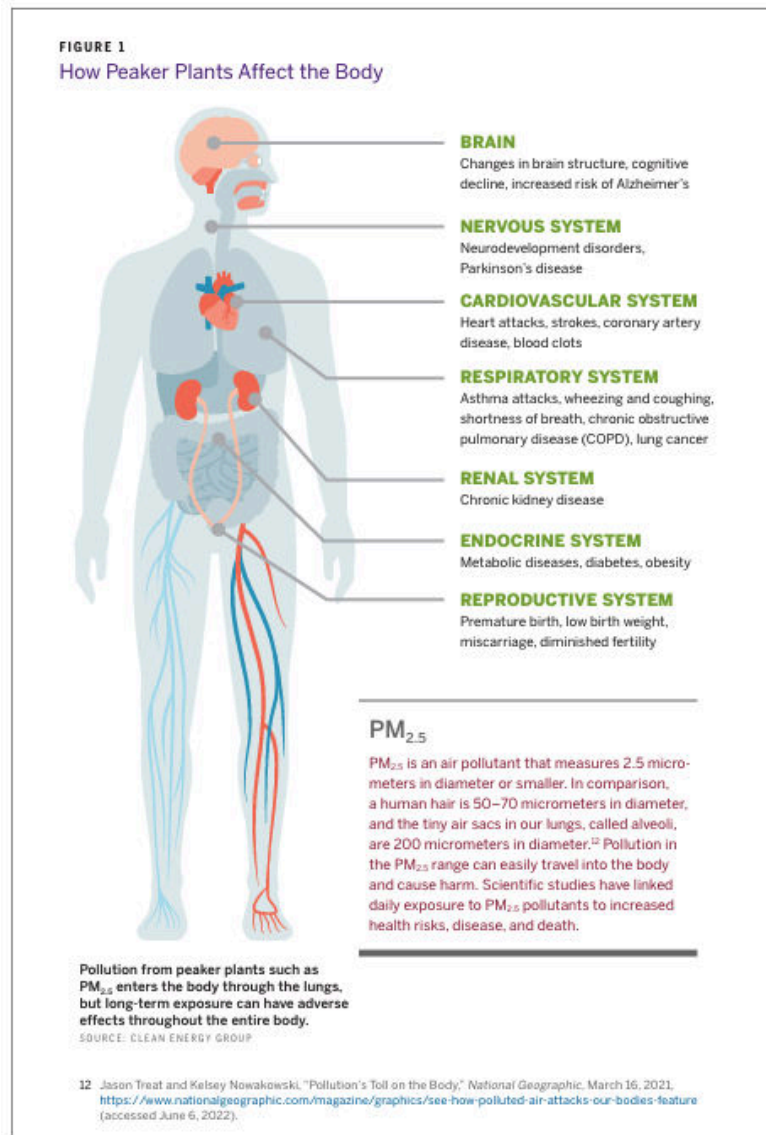
"'Elevated levels of NO<sub>2</sub>' refers to concentrations that exceed ambient (typical) levels found in the air, reaching thresholds known to harm human health. **Prolonged exposure** can contribute to **chronic respiratory conditions** and an **increased risk of cardiovascular disease**. Short-term exposure to elevated levels can irritate the airways and worsen respiratory health, triggering symptoms such as coughing, wheezing and difficulty breathing. **Chronic exposure**, even at moderate levels, has been linked to *higher rates of respiratory illness, long-term cardiopulmonary effects, premature death and increased hospitalizations. Additional health effects include pulmonary fibrosis, reduced lung function, increased risk of ear infections, weakened immune defense and fluid accumulation in the lungs.* (EPA, 2024b). A 2020 study identified a significant link between **long-term NO<sub>2</sub> exposure** and increased risks of both *all-cause and respiratory-related mortality, particularly from COPD and acute lower respiratory infections* (Atkinson et al., 2020). A 2022 review further associated elevated NO<sub>2</sub> levels—along with particulate matter and sulfur dioxide—to serious health effects, such as *heart and lung damage, pregnancy complications, increased risk of kidney and neurological disorders, autoimmune diseases and cancer.*" (p. 4 of ALA supplement, emphasis added)

NO<sub>x</sub> alone is bad enough, but it also reacts in the air to form *secondary* PM2.5 that compounds the PM2.5 *directly* emitted by the gas turbines.

### **PM2.5 health impacts**

PM2.5 is shorthand for particulate matter that is smaller than 2.5 micrometers. A human hair is 50-70 micrometers, and the tiny air sacs in our lungs are 200 micrometers. PM2.5 wreaks havoc on the entire body because it can enter the bloodstream through the lungs and cause inflammation throughout the body. Clean Energy Group and Strategen outlined and illustrated the damage that PM2.5 and other combustion pollutants can cause in their report [The Peaker Problem](#):

- **In the brain**, long-term exposure to PM2.5, SO<sub>2</sub>, and NO<sub>x</sub> can lead to cognitive declines, changes in brain structure, and an increased risk of Alzheimer's disease.
- **In the nervous system**, these pollutants are linked to neurodevelopmental disorders and deaths from Parkinson's disease. Particles can travel to the central nervous system.
- **In the cardiovascular system**, exposure is linked to a higher mortality from coronary artery disease, heart attacks, strokes, and blood clots.
- **In the respiratory system**, it can cause shortness of breath, coughing and wheezing, asthma, lung cancer, and chronic obstructive pulmonary disease (COPD).
- **In the renal system**, long-term exposure to these pollutants is associated with a greater likelihood of chronic kidney disease. Renal disease rates are highest in urban areas.
- **In the endocrine system**, PM2.5 is an endocrine disruptor, contributing to increased development of metabolic diseases such as obesity and diabetes, which in turn are risk factors for cardiovascular disease.
- **In the reproductive system**, small particle pollution exposure is linked to diminished fertility, miscarriages, premature birth, low birth rate, and respiratory diseases.



**Image: From Clean Energy Group and Strategen's The Peaker Problem**

Source: <https://www.cleanegroup.org/wp-content/uploads/The-Peaker-Problem.pdf> p. 15

## Ozone

Ground level ozone is formed when NO<sub>x</sub> and volatile organic compounds combine in sunlight. Ozone exposure has all of the same health impacts as have been discussed above, including premature death. According to the American Lung Association's most recent [State of the Air](#) report, Shelby County was the only county in Tennessee to earn an [F grading in the ozone levels](#) category. It was the **only county to experience red level days in 2024** (2 days) and it experienced a whopping 21 orange level days. The next highest number of orange level days was 9 for Sumner County.

### ***Cumulative impact with TVA proposed new methane gas turbines***

The Tennessee Valley Authority (TVA) is currently [proposing](#) to construct 200 megawatts of new methane gas power capacity at the Allen Combustion Turbine plant. According to TVA's [draft environmental impact statement](#), these new turbines would add up to 47 tons of NO<sub>x</sub> and 34 tons of PM2.5 to Memphis' air per year. While we appreciate that the Shelby County Health Department does not have direct regulatory authority over this TVA facility, we believe that you cannot overlook the impact of TVA's planned expansion while considering xAI's permit. If both projects proceed, it would be a dangerous one-two punch of new emissions hitting the community, with each facility amplifying the harm of the pollution from the other.

### ***Startup and shutdown pollution***

The permit would also allow 22 uncontrolled startup/shutdown cycles per year - approximately 110 turbine running hours during which emission controls will not be operational. These periods will contribute substantially to NO<sub>x</sub>, VOC, CO and HAP emissions. The Department should not allow this level of unregulated pollution, particularly given the county's dangerous levels of ozone.

### **3. The actual pollution during operation may exceed minor source limits**

Per Clean Air Act allowances, the facility's reliance on synthetic minor status is engineered to avoid more stringent Title V major source requirements. The applicant states that it will implement selective catalytic reduction (SCR) to reduce NO<sub>x</sub> and comply with New Source Performance Standards (NSPS) Subpart KKKK, and that SCR represents the most stringent form of Best Available Control Technology (BACT), potentially qualifying as Lowest Achievable Emission Rate (LAER) for turbines.

While these mitigation steps are meaningful, they do not substitute for the broader oversight, continuous monitoring, and accountability that a Title V permit would provide. Synthetic minor permits place the burden of compliance largely on self-reporting and periodic testing rather than real-time verification. Without robust and continuous independent oversight, there remains a meaningful risk that actual emissions could exceed permitted levels or that operational changes could go unreported - particularly for a facility with the scale and intensity of the Colossus Data Center.

This permit also follows disturbing national precedents where facilities strategically capped reported emissions to qualify as synthetic minor sources, only to exceed those limits once in operation - often with devastating public health consequences. For example, [ExxonMobil's](#) Baton Rouge complex, [Motiva's refinery](#) in Port Arthur, Texas, and Formosa Plastics' plants in Louisiana and Texas all operated under synthetic minor status while exposing nearby communities - often low-income and majority Black - to unsafe levels of air pollutants such as benzene and formaldehyde. In each case, EPA enforcement actions eventually reclassified the facilities as major sources, but not before long-term health damage occurred. Shelby County must learn from these examples. Once public health harm occurs, it cannot be undone. Allowing Colossus to operate under synthetic minor status without independent monitoring invites the same irreversible outcomes.

#### **4. Apparent factual errors in permit materials**

The applicant and the Health Department must clarify the facility's actual power capacity and generation before approving any permit. The applicant's permit contains conflicting information about the scale of the gas turbines they are installing. Page 2-1 of the application states that the application is for a permit "to operate fifteen (15) Solar SMT-130 turbines to provide a continuous power source with a capacity of approximately **150 MW** [megawatts]"(emphasis added). Yet elsewhere in the application, it is clear that each of the fifteen turbines has a capacity of 16.48 MW. If each turbine is rated at 16.48 MW, then the total nameplate capacity of the 15 turbines is approximately **247.2 MW**, a far cry from 150 MW.

The application review dated March 2025, currently available on the Shelby County Health Department's public comment webpage, perpetuates confusion about this topic. On page 5, Section III, the second paragraph claims: "The Center constructed fifteen (15) natural gas fired Solar SMT-130 turbine generators, each rated at 16.48 MW, providing a total of 300 MW of continuous power. This includes a 150 MW capacity supplied by MLGW." This statement suggests the facility is receiving 150 MW from the TVA electric grid and approximately 150 MW of power supplied by the on-site combustion turbines. This ambiguity undermines the credibility of the applicant's emissions and operational data.

#### **5. Inadequate environmental justice analysis**



The applicant's January 2025 application includes a limited environmental justice screening, noting that the facility is not located in a Census Block Group with EJ Indexes or Supplemental Indexes exceeding the 80th percentile. However, this analysis falls short of a meaningful cumulative impact review. The facility is sited in Southwest Memphis - specifically ZIP code 38109 - a predominantly Black and low-income community that has long experienced disproportionate exposure to industrial air pollution.

According to EPA's EJScreen tool and [ProPublica's 2021 analysis](#), this area has some of the highest cumulative risks from air toxics in the nation. While the applicant notes plans to mitigate emissions through SCR installation, that does not negate the need for a comprehensive environmental justice analysis that considers existing burdens, historical inequities, and community vulnerability. The absence of a cumulative impact evaluation in the permit's public review process represents a serious oversight, particularly given the community's existing pollution burdens and vulnerability.

#### **6. Lack of public access to permit application material**

The complete application has not been made available on the Shelby County Health Department's website. Members of the public have been asked to submit comments on a permit application, but the actual application has not been made freely available to the public. We understand that the Health Department made hard copies available in limited circumstances, but we see no reason the Department shouldn't have posted the application on their website along with the draft permit and application review documents. By basically withholding the application from public review, the public has been denied key information and details about the project. This compromises the ability of the public to meaningfully evaluate and comment on the full scope of the permit's environmental and community impacts. Transparency and full disclosure are essential to the integrity of delegated permitting programs under the Clean Air Act, particularly when environmental justice communities are involved. The Department must ensure that any permit decision is based on an open, accurate, and complete public record.

#### **Conclusion**

This data center is being constructed and operated for Elon Musk's artificial intelligence company, xAI - a company owned by a figure who has repeatedly promised to lead the world into a clean energy future. Musk's companies have championed electric vehicles and solar power. xAI's installation of 240 megapacks at the facility is a glimpse

of what could be an industrial operation that advances clean energy and contributes to energy reliability. Yet instead, xAI is relying on dirty methane gas combustion in one of the most overburdened communities in the Southeast. Memphis is striving to become a major technology hub - a Silicon Valley of the South - but this must not come at the cost of environmental health, justice, and integrity.

There are cleaner, scalable alternatives available today, including solar, wind, and energy storage that can reliably power data centers without polluting the communities around them. As an organization committed to accelerating the Southeast's transition to clean, equitable energy, SACE believes data centers can and should be leaders in that transformation. Choosing methane gas turbines over clean technologies represents a profound failure of imagination and responsibility.

Approving this permit would not only pollute a vulnerable community - it would betray the promises of economic revitalization and environmental progress.

For all these reasons, the Southern Alliance for Clean Energy urges the Shelby County Health Department to deny this permit, and shut down xAI's current turbine operations until any potential legal violations are resolved. A just and sustainable future for Memphis demands bold leadership, not a retreat to outdated fossil fuel energy infrastructure.

Sincerely,

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