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VIA ELECTRONIC MAIL: *Air-Permits.Comments@dnr.ga.gov*
Mr. Steve Allison
Permitting Program Manager
Air Protection Branch
Environmental Protection Division
4244 International Parkway, Suite 120
Atlanta, GA 30354

RE: Public Comments on State Implementation Plan Air Permit Application No. 29947 for VoltaGrid.

Dear Mr. Allison:

On behalf of itself, Altamaha Riverkeeper, and Sustainable Newton, the Southern Environmental Law Center respectfully submits the following comments on the State Implementation Plan Air Permit Application No. 29947 for VoltaGrid's electric generation facility in Covington, Georgia. VoltaGrid seeks a permit to operate a behind-the-meter power generation unit for the sole purpose of powering a neighboring datacenter. This power generation unit (the "facility") consists of thirty-three Jenbacher J620 natural gas-fired, four-stroke lean-burn, reciprocating internal combustion engines ("J260 RICEs"); two Mesa Solutions natural gas-fired fuel gas heaters; one Algas natural gas-fired black start emergency engine generator; and five Caterpillar temporary engines. The location for the proposed facility is Hazelbrand Road NE, Covington, Georgia.

VoltaGrid's application underestimated its potential formaldehyde emissions and failed to justify its calculation of potential carbon monoxide ("CO") and nitrogen oxides ("NO_X") emissions. Georgia Environmental Protection Division ("EPD") must permit the facility as a major source of formaldehyde or otherwise include enforceable synthetic minor limits for formaldehyde. EPD must also require VoltaGrid to frequently test its J620 RICEs to ensure the facility-wide CO emissions will meet the facility's proposed synthetic minor permit limitation or impose more stringent synthetic minor limitations than proposed; and EPD must require VoltaGrid to justify its low NO_X emissions estimate.

I. VoltaGrid's calculations are unjustified and underestimate potential emissions of formaldehyde, CO, and NO_X.

The Clean Air Act's Title V major source threshold is the potential to emit at least 100 tons per year of a criteria pollutant.[1] The criteria pollutants are sulfur dioxide, NO_X, CO, lead, particulate matter, and precursors to ozone.[2] The Title V major source threshold for hazardous air pollutants is the potential to emit at least 10 tons per year of a single hazardous air pollutant, or 25 tons per year of total hazardous air pollutants.[3]

The potential to emit is defined as the "maximum capacity of a stationary source to emit any air pollutant under its physical and operational design."[4] This calculation must reflect "worst-case conditions" and "continuous 24 hours per day, 365 days per year operation."[5] But a source may also account for "[a]ny physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restriction on hours of operation or on the type or amount of material combusted, stored, or processed,"[6] so long as the limitation is "legally and practically enforceable."[7] For a limitation to be practically enforceable, it must be accompanied by "terms and conditions . . . sufficient to enable regulators and citizens to determine whether the limit has been exceeded and, if so, to take appropriate enforcement action."[8]

EPA provides and frequently updates a database of emission factors for various emission units, called AP-42.[9] In the absence of site-specific data, these generic emission factors can be used to calculate an emission unit's potential to emit. Each AP-42 emission factor is rated, and "factors based on many unbiased observations, or on widely accepted test procedures" receive higher ratings.[10]

VoltaGrid's proposed facility would have forty-one emission units, for which it calculated a potential to emit. These units are: thirty-three J260 RICEs; two Mesa Solutions natural gas-fired

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[1] 42 U.S.C. § 7661(2) (defining "major source" as used in Title V to include "[a] major stationary source as defined in section 7602 of this title"); *id.* § 7602(j) ("[T]he terms 'major stationary source' and 'major emitting facility' mean any stationary facility or source of air pollutants which directly emits, or has the potential to emit, one hundred tons per year or more of any air pollutant . . . .").
[2] *See generally* 40 C.F.R. § 50.
[3] 40 C.F.R. § 63.2 ("*Major source* means any stationary source . . . that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants.").
[4] 40 C.F.R. § 70.2.
[5] Georgia Department of Natural Resources, *Procedure to Calculate a Facility's "Potential to Emit" and To Determine Its Classification* 3 (2018).
[6] *Id.*; *see also* 40 C.F.R. § 70.2; GA. COMP. R. & REGS. 391-3-1-.01(ddd).
[7] GA. COMP. R. & REGS. 391-3-1-.01(ddd).
[8] *In the Matter of Orange Recycling & Ethanol Prod. Facility, Pencor-Masada Oxynol, llc.*, Order on Petition No. II-2001-05, at 7 (E.P.A. Apr. 8, 2002) [https://perma.cc/8AT6-54U2]; *see also In re Piedmont Green Power, LLC*, Order on Petition No. IV-2015-2 (Dec. 13, 2016), at 14.
[9] AP-42, Introduction (2024) [https://perma.cc/R6HY-WLEB].
[10] *Id.* at 9.

fuel gas heaters; one Algas natural gas-fired black start emergency engine generator; and five Caterpillar temporary engines.[11]

a. VoltaGrid is a major source of formaldehyde.

For formaldehyde, VoltaGrid calculated a facility-wide potential to emit of 5.26 tons per year;[12] but as described below, we calculate a potential to emit of 10.00394 tons per year, *without* including the five temporary engines. Therefore, EPD must permit the facility as a major source of formaldehyde or otherwise include enforceable synthetic minor limits for formaldehyde.

For the black-start emergency engine, and the two fuel gas heaters, VoltaGrid relied on AP-42 emission factors for all hazardous air pollutants.[13] But for the thirty-three J620 RICEs and the five temporary engines, VoltaGrid relied on AP-42 for all hazardous air pollutants *except* formaldehyde.[14] VoltaGrid instead relied on manufacturer specifications, which were provided in a Jenbacher "Emission letter" for the J620 RICEs and a Caterpillar "Gas Engine Technical Data" document for the temporary engines.

Jenbacher's emission letter comes with a performance guarantee, in which Jenbacher promises to replace a poorly performing J620 RICE. But Jenbacher failed to provide a formaldehyde emission factor in this letter, or anywhere else in the provided specifications.[15] Thus, should a J620 RICE not meet the formaldehyde emissions rate that VoltaGrid calculated, Jenbacher is under no obligation to replace the engine on that basis. VoltaGrid instead states that "CH2O emissions are based on test data for J620 engines at a comparable facility in Texas" but does not provide the referenced stack testing data or related protocols.[16] In contrast, Caterpillar, the temporary engine manufacturer, *did* provide a formaldehyde emission factor in its "Gas Engine Technical Data."[17] And Caterpillar's emission factor is slightly higher than that provided in AP-42.[18]

Because of the lack of manufacturer test data or "guarantee" regarding the formaldehyde emissions from the J620 RICEs, VoltaGrid should instead use the AP-42 formaldehyde emission factor for natural gas-fired, four-stroke lean-burn reciprocating internal combustion engines.[19]

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[11] VoltaGrid Air Permit Application, at 41,71–74.
[12] *See id.* at 57.
[13] *See* VoltaGrid Air Permit Application, at 65 n.1 ("Toxics/HAP emission factors are based on AP-42. Chapter 3.2-3."); *id.* at 66 n.3 ("Emission factors for HAPs and TAPs are based on AP-42, Section 1.4, Natural Gas Combustion (July 1998, Table 1.4-3 and 1.4-4.").
[14] *See id.* at 62 n.1, 74 n.1 ("Toxics/HAP emission factors are based on AP-42. Chapter 3.2-2. Emission factor for formaldehyde are provided by the manufacturer.").
[15] *Id.* at 134–35.
[16] *Id.* at 58 n.1.
[17] *Id.* at 154.
[18] *Id.* (listing emission factor as 0.18 g/bhp-hr, which, when converted to pounds, divided by 6,340 Btu/bhp-hr, and converted to MMBtu, equals 0.0626 lb/MMBtu compared to AP-42's 0.0205 lb/MMBtu).
[19] AP-42, Chapter 3.2 Natural Gas-fired Reciprocating Engines, at 3.2-12 (Oct. 2024) [https://perma.cc/9833-HNQC].

This emission factor is recent (2024), A-rated, and based on "emissions data points taken from 70 emission reports containing over 400 source tests."[20]

The AP-42 uncontrolled emission factor for formaldehyde emissions from a natural gas-fired, four-stroke, lean-burn reciprocating internal combustion engine is 0.0528 pounds formaldehyde per MMBtu.[21] The J620 RICE's heat input at 100% load is 26.028 MMBtu per hour.[22] Thus, using the AP-42 emission factor, a single J620 RICE operating at 100% load emits an uncontrolled 1.3743 pounds of formaldehyde per hour. And assuming the internal oxidation catalyst controls formaldehyde emissions at 95% efficiency,[23] the engine emits a controlled 0.06871 pounds of formaldehyde per hour.

The total potential to emit any pollutant from the thirty-three J620 RICEs is calculated using Equation 1, where "PTE" is potential to emit and "EF" is emission factor:[24]

Equation 1: Potential to Emit Calculation for the Thirty-Three J620 RICEs.

$$PTE\ (\frac{tons}{yr}) = \frac{33 \times (Controlled\ EF\ \left(\frac{lbs}{hr}\right) \times 8757\ \frac{hr}{yr} + Uncontrolled\ EF\ \left(\frac{lbs}{hr}\right) \times 3\ (\frac{hr}{yr})}{2000\ \frac{lbs}{ton}}$$

When calculated with the AP-42 controlled and uncontrolled emission factors, the total potential to emit formaldehyde from the thirty-three J620 RICEs operating at 100% load is 9.9965 tons per year.

VoltaGrid used an AP-42 formaldehyde emissions factor to calculate potential formaldehyde emissions from the black-start emergency engine (0.00486 tons per year[25]) and the fuel gas heaters (0.00258 tons per year[26]). Taken together and without including the five temporary engines, the thirty-three J620 RICEs, the black-start emergency engine generator, and the two fuel gas heaters have a combined annual total potential to emit of 10.00394 tons of formaldehyde. With the temporary engines added in, this comes to 12.64394 tons formaldehyde

[20] *Id.* at 3.2-6.
[21] *Id.*
[22] *See* VoltaGrid Air Permit Application, at 80 (listing the power input at 100% load as 26,028 MBtu per hour). VoltaGrid contradicts itself by listing the power input of the J260 RICE as 25 MMBtu per hour in Form 2.01 of its application but later claiming to list "Post Control Emissions (100% Load)" in its emissions calculations. *Id.* at 42, 58. Based on the Jenbacher specifications, a power input of 25 MMBtu per hour is closer to 96.2% load. *Id.* at 80.
[23] *See id.* at 58.
[24] *See id.* at 13 ("[U]p to one hour per month . . . and three (3) hours per year will be spent in startup for each engine. . . . [I]t is . . . assumed that 3 hours per engine per year results in uncontrolled emissions, and 8,757 hours per engine per year are controlled emissions.").
[25] *Id.* at 57; AP-42, Chapter 3.2 Natural Gas-fired Reciprocating Engines, at 3.2-16 (Oct. 2024) [https://perma.cc/9833-HNQC].
[26] VoltaGrid Air Permit Application, at 66–67. AP-42, Chapter 1.4 Natural Gas Combustion.

per year.[27] Both figures exceed the Title V major source threshold for a single hazardous air pollutant.

Given that the facility-wide potential to emit formaldehyde is 10.00395 tons per year, VoltaGrid must also rerun the SCREEN3 dispersion model for its Toxic Impact Assessment. The annual long-term Acceptable Ambient Concentration for formaldehyde is 0.09 µg per cubic meter and the current SCREEN3 result for annual formaldehyde long-term impact is 0.07 µg per cubic meter.[28] Although the relationship between potential to emit and dispersion is not exactly linear, it would stand to reason the formaldehyde short- and long- term impact would increase, if not outright double, when using the correct potential to emit.

b. VoltaGrid's synthetic minor permit limitation for carbon monoxide must be practically and legally enforceable.

VoltaGrid's calculated potential to emit CO exceeds the Title V major source threshold (115.10 tons per year); but VoltaGrid is requesting a permit limit under this threshold (99 tons per year).[29] If this request is granted, VoltaGrid would be a synthetic minor source of CO emissions, and EPD must include a legally and practically enforceable permit condition to physically or operationally limit VoltaGrid's CO emissions.[30]

But VoltaGrid failed to identify which physical or operational limit(s) it will take to meet the synthetic permit limit of 99 tons of CO per year, despite EPD guidance to the contrary. EPD states "the facility must determine if the pollution generating equipment can accept any of the following physical and operational limitations" including "[r]estriction on hours of operation to below 8760 hours per year;" "on types or amounts of material combusted;" "on types or amounts of material processed;" and "reduction of allowable emission limits supported by practically enforceable requirements for the operation of Air pollution control equipment."[31] The last of these limitations has already been assumed by VoltaGrid in its potential to emit calculation, and cannot be a limitation relied upon for synthetic minor status.[32]

In this same vein, VoltaGrid's assumption that the emergency generator will only run for 100 hours per year must also be incorporated as an enforceable permit limitation. In fact, EPD requires an assumption of 200 hours total operating hours per year "regardless of NSPS or RICE

[27] VoltaGrid calculated that the for the year the five temporary engines are operating, the engines will contribute 2.64 tons per year of formaldehyde. VoltaGrid Air Permit Application, at 74. This is based on the Caterpillar-provided "Gas Engine Technical Data." *Id.* at 154.
[28] *Id.* at 27.
[29] VoltaGrid Air Permit Application, at 15.
[30] GA. COMP. R. & REGS. 391-3-1-.01(ddd); Georgia Department of Natural Resources, *Procedure to Calculate a Facility's "Potential to Emit" and To Determine Its Classification*, at G-1 (2018).
[31] Georgia Department of Natural Resources, *Procedure to Calculate a Facility's "Potential to Emit" and To Determine Its Classification*, at G-1 (2018).
[32] *See* VoltaGrid Permit Application, at 58 (calculating the J620 RICE potential to emit using a control system efficiency).

MACT applicability" for emergency generators in Newton County unless "[l]ower operating limits" are "established by permit condition."[33]

c. VoltaGrid failed to justify inconsistent treatment for carbon monoxide emissions calculations from the J620 RICEs.

For CO, VoltaGrid calculated a facility-wide potential to emit using the Jenbacher "Emission letter," which guaranteed that controlled emissions performance of each J620 RICE will not exceed the emissions performance listed in the letter.[34] **Figure 1** is an excerpt from this letter:

Figure 1: Excerpt from Jenbacher "Emission Letter" for the J620 RICEs.[35]

Emission values (as half hour average values) *):

Pollutant	lb/hr	tpy
NOX	0,15	0,66
CO	0,62	2,84
VOC (as NMNEHC, expressed as C)	0,15	0,66
PM2,5	0,1	0,44
PM10	0,1	0,44
SO2**)	0,05	0,22

VoltaGrid calculated its controlled and uncontrolled potential to emit using the emissions factors provided for the J620 RICEs, with the addition of a formaldehyde emission factor from "test data . . . at a comparable facility in Texas."[36] But instead of relying solely on the Jenbacher guarantee, VoltaGrid added a "proposed safety factor" to calculate each controlled emission factor.[37] These buffered controlled emission factors were then used, along with the approximate control system efficiencies, to back-calculate the uncontrolled emissions factors for each pollutant.[38] **Figure 2** is VoltaGrid's potential to emit calculations per J620 RICE, with the "Proposed Safety Factor" column boxed in red:

[33] Georgia Department of Natural Resources, *Procedure to Calculate a Facility's "Potential to Emit" and To Determine Its Classification*, at D-1 (2018).
[34] VoltaGrid Permit Application, at 133.
[35] *Id.*
[36] *Id.* at 58 n.1.
[37] *Id.* at 58.
[38] *Id.*

Figure 2: VoltaGrid's Potential to Emit Calculations per J620 RICE.[39]

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Table 2. Engine Specifications and Vendor Emissions Data

Parameter	Units	Post-Control Emissions (100% Load)	Proposed Safety Factor	Post-Control Emissions (100% Load) with Safety Factor	Calculated Pre-Control Emissions	Control Device	Approx. Control Efficiency
Model	Jenbacher J620						
Number of Engines	33						
Generator Rating [1]	MWe	3.30					
MW to hp; 1 MW =	1341.0 hp						
Engine Power[1]	hp	4,425					
Brake-Specific Fuel Consumption[1]	BTU/hp-hr	5,657					
Heat Input Rate	MMBtu/hr	25.0					
Natural Gas HHV [2]	Btu/scf	1,020					
Fuel Consumption[1]	scf/hr	0.025					
VOC[1]	lb/hr per engine	0.15	20%	0.18	3.60	Oxidation Catalyst	95%
NOx[1]	lb/hr per engine	0.15	20%	0.18	9.00	SCR	98%
CO[1]	lb/hr per engine	0.62	5%	0.65	13.02	Oxidation Catalyst	95%
PM/PM_{10}/$PM_{2.5}$[1]	lb/hr per engine	0.10	20%	0.12	0.12	N/A	0%
SO_2[1]	lb/hr per engine	0.05	20%	0.06	0.06	N/A	0%
CH_2O[1]	lb/hr per engine	0.015	20%	0.018	0.36	Oxidation Catalyst	95%

Notes:

1. Information provided by Jenbacher and VoltaGrid. CH2O emissions are based on test data for J620 engines at a comparable facility in Texas.
2. Natural gas HHV based on a typical value of 1,020 Btu/scf.

VoltaGrid used a 20% "safety factor" for all pollutants with a guaranteed emission factor from Jenbacher, *except* CO, for which it used 5%. VoltaGrid failed to explain the use of these safety factors, or why it thinks its power generation facility will run less efficiently than the Jenbacher guarantees. VoltaGrid also failed to explain why CO is calculated at a buffer four times smaller than for all other pollutants. We calculated the J620 RICEs' total potential to emit using safety buffers ranging from 0% to 20%, displayed in **Table 1**.

[39] VoltaGrid Permit Application, at 58.

Table 1: Comparison of Emissions Factors and Potential to Emit Carbon Monoxide for J620 RICEs at Safety Factors Between 0% and 20% and the Impact on Facility-Wide Emissions.

Safety Factor	Controlled Emission Factor (lbs/hr)	Uncontrolled Emission Factor (lbs/hr)	Total controlled potential to emit for J620 RICEs (tons/yr)	Facility-wide total controlled potential to emit (tons/yr)
0%	0.62	12.4	90.20	110.59
5%	0.65	13.02	94.71	115.10
10%	0.68	13.64	99.22	119.61
15%	0.71	14.26	103.73	124.12
20%	0.74	14.88	108.24	128.63

Table 1 demonstrates that regardless of which safety factor is used, the facility-wide total controlled potential to emit puts the facility squarely above the Title V major source threshold for CO. This begs the question, why use a significantly smaller safety factor for CO? The only plausible answer is that, despite its obvious concerns with Jenbacher's provided emissions factors, VoltaGrid wants to avoid even more stringent synthetic minor permit limitations.

But frequent testing of each engine should alleviate VoltaGrid's concerns—if testing demonstrates that even one J620 RICE is running 5% worse than Jenbacher promised (0.65 pounds CO per hour rather than 0.62 pounds CO per hour), as reflected in VoltaGrid's emissions calculations, then Jenbacher is obligated to cure this issue.[40] Rather than rely on a safety buffer that is inconsistently applied across pollutants for the *same* equipment, frequent testing is a much more reliable indicator of performance and would allow VoltaGrid to take advantage of the Jenbacher guarantee.

And testing only one of the thirty-three engines is insufficient because, according to EPA,"[i]t is not unusual to test emissions from two identical engines in the same plant, operated by the same personnel, using the same fuel, and have the test results show significantly different emissions."[41] Plus the Jenbacher guarantee is engine specific.

Alternatively, VoltaGrid must take more stringent synthetic minor permit limitations that reflect the 20% safety buffer applied to all other criteria pollutants and formaldehyde.

[40] *See* VoltaGrid Permit Application, at 131 ("In the case the must meet emission performance guarantees are not achieved after the cure period INNIO Jenbacher will replace the affected Unit.").
[41] AP-42, Chapter 3.2 Natural Gas-fired Reciprocating Engines, at 3.2-3 (Oct. 2024) [https://perma.cc/9833-HNQC].

d. VoltaGrid underestimated its NO_X emissions.

Jenbacher guaranteed that the J620 RICEs emit no more than 0.15 pounds of NO_X per hour per engine from 85% to 100% load. VoltaGrid's safety buffer bumps this emission factor to 0.18 pounds of NO_X per hour. Using the buffered emission factor, VoltaGrid calculated that the J620 RICEs have a total potential to emit of 26.45 tons of NO_X per year.

But both the manufacturer's guarantee and the buffered factor are considerably lower than the AP-42 emission factors for NO_X emissions for both 90% to 105% load and less than 90% load. For 90% to 105% load, a four-stroke, lean-burn reciprocating internal combustion engine emits an uncontrolled 4.08 pounds NO_X per MMBtu. Using this AP-42 emission factor, the thirty-three J620 RICEs have the potential to emit 312.154 tons NOx per year at 90% to 105% load.[42]

At less than 90% load, a four-stroke, lean-burn reciprocating internal combustion engine emits an uncontrolled 0.847 pounds per MMBtu.[43] Using this AP-42 emission factor, the thirty-three J620 RICEs have the potential to emit 50.280 tons of NO_X per year. And the same exercise at 50% load results in 35.245 tons of NO_X per year.

VoltaGrid calculated a potential to emit of 26.45 tons of NO_X per year from the J620 RICEs running anywhere from 85% to 100% load using a manufacturer guaranteed emission factor. Yet applying the AP-42 emissions factors to the J620 RICEs at 100%, 75%, and 50% load begets larger NO_X emissions than what VoltaGrid calculates at 100% load. VoltaGrid failed to explain why the J620 RICEs emit the same amount of NO_X at such a wide range of loads or why the Jenbacher guarantee is significantly lower than the AP-42 factors.

II. Conclusion.

VoltaGrid's formaldehyde, CO, and NO_X emissions calculations are either underestimated, unjustified, or both. For formaldehyde, EPD must permit the facility as a Title V major source of hazardous air pollutants or otherwise include enforceable synthetic minor limits. For CO, EPD must require VoltaGrid to frequently test each J620 RICE to confirm the accuracy of that emission factor. Otherwise, EPD should treat all pollutants the same and add a 20% safety buffer to the CO emission factor, which would then require inclusion of more stringent synthetic minor limits. And for NO_X, VoltaGrid must justify its use of a single emission factor for a variety of operating loads, as well as why its estimates are so much lower than those calculated using AP-42.

Additionally, the synthetic minor permit limitation for CO (as well as any other pollutant that is above the Title V major source threshold, such as formaldehyde) must be included in a permit

[42] At 26.028 MMBtu per hour, which is the power input for a J620 RICE at 100% load, the engine emits an uncontrolled 106.194 pounds NOx per hour. *See VoltaGrid Permit Application*, at 154. Assuming the control system performs at 98% efficiency, this would be controlled emission of 2.124 pounds NOx per hour. *Id.* at 58. This is calculated using Equation 1. *See supra* Equation 1.

[43] At 75% load, a J620 RICE power input is 20.196 MMBtu per hour. *See VoltaGrid Permit Application*, at 154. Thus, the NOx emission factor is an uncontrolled 17.106 pounds per hour and a controlled 0.342 pounds per hour. *Id.* at 58 (listing control system efficiency for J620 RICE).

condition that is practically and legally enforceable. At this time, the public does not know how EPD will draft this permit condition and thus cannot comment upon the enforceability of the limit. This is a prime example of why the public should continue to be able to comment on synthetic minor draft permits, along with the applications.

Sincerely,

/s/Marissa Land

Marissa Land
Associate Attorney
Southern Environmental Law Center