

Commonwealth of Kentucky
Division for Air Quality
STATEMENT OF BASIS / SUMMARY

Title V, Operating
Permit: V-25-001
East Kentucky Power Cooperative, Inc. in care of Bavarian County Landfill
12760 McCoys Fork Road
Walton, KY 41094
January 15, 2025
Ossama Ateyeh, Reviewer

SOURCE ID:	21-015-00138
AGENCY INTEREST:	44393
ACTIVITY:	APE20240001

Table of Contents

SECTION 1 – SOURCE DESCRIPTION	2
SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM.....	3
SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS	4
SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS	8
SECTION 5 – PERMITTING HISTORY	9
SECTION 6 – PERMIT APPLICATION HISTORY.....	10
APPENDIX A – ABBREVIATIONS AND ACRONYMS	10

SECTION 1 – SOURCE DESCRIPTION

SIC Code and description: 4911, Electric Services (other electric power generation)

Single Source Det. Yes No If Yes, Affiliated Source AI: 275

Source-wide Limit Yes No If Yes, See Section 4, Table A

28 Source Category Yes No If Yes, Category:

County: Boone

Nonattainment Area N/A PM₁₀ PM_{2.5} CO NO_x SO₂ Ozone Lead
If yes, list Classification:

PTE* greater than 100 tpy for any criteria air pollutant Yes No

If yes, for what pollutant(s)?

PM₁₀ PM_{2.5} CO NO_x SO₂ VOC

PTE* greater than 250 tpy for any criteria air pollutant Yes No

If yes, for what pollutant(s)?

PM₁₀ PM_{2.5} CO NO_x SO₂ VOC

PTE* greater than 10 tpy for any single hazardous air pollutant (HAP) Yes No

If yes, list which pollutant(s): Formaldehyde

PTE* greater than 25 tpy for combined HAP Yes No

*PTE does not include self-imposed emission limitations.

Description of Facility:

East Kentucky Power Cooperative, Inc. (EKPC) in care of Bavarian County Landfill, purchases and combusts treated landfill gas from Bavarian County Landfill located at 12764 McCoys Fork Road, Walton, KY 41094 to produce energy.

SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM

Permit Number: V-25-001

Activities: APE20240001

Received: November 7, 2024,

Application Complete Date(s): January 14, 2025

Permit Action: Initial Renewal Significant Rev Minor Rev Administrative.

Construction/Modification Requested? Yes No NSR Applicable? Yes No

Previous 502(b)(10) or Off-Permit Changes incorporated with this permit action Yes No

Description of Action:

This is a permit renewal, the only change to the emission unit covered by this permit is the addition of a parts washer. The parts washer is being added as an insignificant activity as requested by the Division. The change in PTE shown in the table below is the result of refinements made to the emission calculations consistent with previous determinations made by the Division.

V-25-001 Emission Summary				
Pollutant	2023 Actual (tpy)	Previous PTE V-17-047 (tpy)	Change (tpy)	Revised PTE V-25-001 (tpy)
CO	208.5	235.35	67.29	302.64
NO _x	108.2	119.40	33.83	153.23
PT	6.42	7.50	1.94	9.44
PM ₁₀	6.42	7.50	1.94	9.44
PM _{2.5}	6.33	7.34	2.1	9.44
SO ₂	30.9	36.0	-33.08	2.92
VOC	47.8	55.0	15.72	70.72
Lead	0	0	0	0
Greenhouse Gases (GHGs)				
Carbon Dioxide	17,257	20,099	3,499	23,598
Methane	0.30	1.25	0.18	1.43
Nitrous Oxide	0.22	0.25	0.03	0.28
CO ₂ Equivalent (CO ₂ e)		20,206	3,511	23,717
Hazardous Air Pollutants (HAPs)				
Formaldehyde	12.02	14.51	-0.03	14.48
Benzene		0.082	-0.058	0.024
Hexane; N-Hexane	0.18	0.211	-0.0138	0.073
Toluene	0.38	0.44	-0.418	0.022
Xylenes (Total)		0.078	0.088	0.166
Combined HAPs:		19.21	-3.65	15.65

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS

Emission Unit #EU01-1, EU01-2, EU01-3, and EU01-4 Internal Combustion Engines

Initial Construction Date:

4/3/2003 EU01-1

4/10/2003 EU01-2; EU01-3; & EU01-4

Process Description:

These are Caterpillar G3516LE 4SLB stationary SI RICE that combust only treated (filtered, de-watered, and compressed) landfill gas supplied by the adjacent Bavarian Landfill.

Mechanical Power in bhp:	1,148
Specific Fuel Consumption rate:	7,897
Fuel Input (MMBtu/hr)	9.1 MMBtu/hr
Annual Average heating Value	618 Btu/scf
Typical Methane Content:	55%

Applicable Regulation:

401 KAR 63:002 Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines is applicable because these are stationary RICEs at a major or area source of HAP emissions.

Non-applicable Regulation:

401 KAR 60:005 Section 2(2)(eeee), 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines is non-applicable because although the date of construction commencement is after the classification date 6/12/06, the manufacture date is before the sub-classification date 1/1/08 for lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP.

Comments:

No emission limitations apply to these emission units.

Fuel Consumption in terms of SCC = $1148 * 7897 / 618 / 1000000 = 0.0147$ MMscf/hr

The emission factor used for formaldehyde is a conservative 40.5 lb/MMscf based upon a Michigan DEQ determination for a similar LGTE facility (same engines). The facility, Adrian Energy Associates, LLC, altered their emission factor after Caterpillar found increased formaldehyde emissions and updated the spec sheet.

This is a major source of HAP;

Note: Trace emissions of HAP'S will occur due to incomplete combustion of methane and other organic compounds in the landfill gas. **Emission Factors for incomplete combustion are not available for landfill gas combustion system. Therefore Emission factors for natural gas combustion in 4-stroke lean burn engines provided in AP-42 Table 3.2-2** was used in the calculation of Formaldehyde.

Emission Unit #EU03-1 Internal Combustion Engine				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
NO _x	3.0 g/HP-hr. (220 ppmvd at 15% O ₂)	40 CFR 60.4233(e)	642.39 lb./MMscf	The permittee shall demonstrate compliance by purchasing a certified engine and demonstrating compliance according to 40 CFR 60.4243(a) or purchasing a non-certified engine, demonstrating compliance with the requirements in 40 CFR 60.4244 as applicable, keeping a maintenance plan and records of conducted maintenance, and conduct performance testing every 8,760 hours of operation or 3 years, whichever comes first.
CO	5.0 g/HP-hr. (610 ppmvd at 15% O ₂)	40 CFR 60.4233(e)	1070.66 lb./MMscf	
VOC	1.0 g/HP-hr. (80 ppmvd at 15% O ₂)	40 CFR 60.4233(e)	214.13 lb./MMscf	

Initial Construction Date:5/2/2008

Process Description:

Caterpillar G3520 4SLB stationary SI RICE that combust only treated (filtered, de-watered, and compressed) landfill gas supplied by the adjacent Bavarian Landfill.

Mechanical Power in bhp: 2,233 bhp
 Specific Fuel Consumption rate: 6,357
 Fuel Input MMBtu/hr 14.2 MMBtu/hr
 Annual Average heating Value 618 Btu/scf
 Typical Methane Content: 55%

Applicable Regulation:

401 KAR 63:002 Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines is applicable because these are stationary RICEs at a major or area source of HAP emissions.

401 KAR 60:005 Section 2(2)(eeee), 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS (CONTINUED)

Testing Requirements/Results

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
EU03-1		NO _x	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	7E	220PPM@ 15%O ₂	78.75	High (1640 KW)	CMN20160001	12/20/2016
EU03-1		VOC(TG NMO)	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	Alt-096	80PPM @15%O ₂	1.52	High (1640 KW)	CMN20160001	12/20/2016
EU03-1		CO	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	10	610PPM@ 15%O ₂	442.80	High (1640 KW)	CMN20160001	12/20/2016
EU03-1		NO _x	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	7E	220PPM@ 15%O ₂	28.55	High (1642 KW)	CMN20170001	9/6/2017
EU03-1		VOC(TG NMO)	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	Alt-096	80PPM @15%O ₂	33.12	High (1642 KW)	CMN20170001	9/6/2017
EU03-1		CO	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	10	610PPM@ 15%O ₂	479.65	High (1642 KW)	CMN20170001	9/6/2017
EU03-1		NO _x	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	7E	220PPM@ 15%O ₂	49.50	High (1658 KW)	CMN20180001	10/16/2018
EU03-1		VOC(TG NMO)	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	Alt-096	80PPM @15%O ₂	11.60	High (1658 KW)	CMN20180001	10/16/2018
EU03-1		CO	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	10	610PPM@ 15%O ₂	487.40	High (1658 KW)	CMN20180001	10/16/2018
EU03-1		NO _x	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	7E	220PPM@ 15%O ₂	48.42	High (1635.2 KW)	CMN20190001	10/15/2019
EU03-1		VOC(TG NMO)	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	Alt-096	80PPM @15%O ₂	11.85	High (1635.2 KW)	CMN20190001	10/15/2019
EU03-1		CO	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	10	610PPM@ 15%O ₂	377.43	High (1635.2 KW)	CMN20190001	10/15/2019

EU03-1		NO _x	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	7E	220PPM@ 15%O ₂	35.94	High (1615.2 KW)	CMN20200001	10/20/2020
EU03-1		VOC(TG NMO)	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	Alt-096	80PPM @15%O ₂	33.49	High (1615.2 KW)	CMN20200001	10/20/2020
EU03-1		CO	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	10	610PPM@ 15%O ₂	372.82	High (1615.2 KW)	CMN20200001	10/20/2020
EU03-1		NO _x	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	7E	220PPM@ 15%O ₂	37.28	High (1617.1 KW)	CMN20200002	12/7/2021
EU03-1		VOC(TG NMO)	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	Alt-096	80PPM @15%O ₂	18.24	High (1617.1 KW)	CMN20200002	12/7/2021
EU03-1		CO	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	10	610PPM@ 15%O ₂	240.50	High (1617.1 KW)	CMN20200002	12/7/2021
EU03-1		NO _x	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	7E	220PPM@ 15%O ₂	21.64	High (1553 KW)	CMN20230001	11/3/2023
EU03-1		VOC(TG NMO)	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	Alt-096	80PPM @15%O ₂	23.18	High (1553 KW)	CMN20230001	11/3/2023
EU03-1		CO	40 CFR 60.4243(b)	8,760 hrs or 3 years, first	10	610PPM@ 15%O ₂	414.17	High (1553 KW)	CMN20230001	11/3/2023

FOOTNOTES

No testing requirements currently apply to EU01-1 EU01-2 EU01-3 or EU1-4 unless requested by the Cabinet.

EPA Method 7E – NO_x EPA Method Alt-096 – VOC(TG NMO)

EPA Method 10 – CO EPA Method 3A – O₂

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:

N/A

Table B - Summary of Applicable Regulations:

Applicable Regulations	Emission Unit
401 KAR 63:002 Section 2(4)(eeee) , 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ) National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.	EU01-1 EU01-2 EU01-3 EU01-4 & EU03-1
401 KAR 60:005 Section 2(2)(eeee) , 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	EU03-1

Table C - Summary of Precluded Regulations:

N/A

Table D - Summary of Non Applicable Regulations:

Non Applicable Regulations	Emission Unit
401 KAR 60:005 Section 2(2)(eeee) , 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	EU01-1 EU01-2 EU01-3 & EU01-4

Air Toxic Analysis

N/A

Single Source Determination

Bavarian Trucking Company is co-located with the East Kentucky Power Cooperative – Bavarian Station Gas to Electric Plant. These two entities also have SIC codes containing the same first two digits (49), and otherwise appear to be a single source. However, based on the information provided to the Division, these two entities do not share a common control relationship. Among other reasons, the two entities do not share employees, neither relies on the other for compliance with applicable regulations, and one does not exert control or have ownership over the other. If the relationship between these two entities were to change such that they become commonly controlled, the Division will reevaluate its position. Accordingly, based on available information, the Division has determined that these two entities constitute separate sources under regulation and will be treated as such.

SECTION 5 – PERMITTING HISTORY

Permit	Permit Type	Activity#	Complete Date	Issuance Date	Summary of Action
G-02-002	Initial	APE20060001	--	3/14/2003	Initial Title V General Constructing / Operating Permit
G-07-002	Renewal	APE20070001	9/23/2007	2/19/2008	Permit Renewal
G-12-002	Renewal	APE20120001	10/14/2012	6/19/2013	Permit Renewal
V-17-047	Renewal	APE20170001	12/22/2017	5/11/2020	Renewal Title V Permit

SECTION 6 – PERMIT APPLICATION HISTORY

N/A

APPENDIX A – ABBREVIATIONS AND ACRONYMS

AAQS	– Ambient Air Quality Standards
BACT	– Best Available Control Technology
Btu	– British thermal unit
CAM	– Compliance Assurance Monitoring
CO	– Carbon Monoxide
Division	– Kentucky Division for Air Quality
ESP	– Electrostatic Precipitator
GHG	– Greenhouse Gas
HAP	– Hazardous Air Pollutant
HF	– Hydrogen Fluoride (Gaseous)
MSDS	– Material Safety Data Sheets
mmHg	– Millimeter of mercury column height
NAAQS	– National Ambient Air Quality Standards
NESHAP	– National Emissions Standards for Hazardous Air Pollutants
NO _x	– Nitrogen Oxides
NSR	– New Source Review
PM	– Particulate Matter
PM ₁₀	– Particulate Matter equal to or smaller than 10 micrometers
PM _{2.5}	– Particulate Matter equal to or smaller than 2.5 micrometers
PSD	– Prevention of Significant Deterioration
PTE	– Potential to Emit
SO ₂	– Sulfur Dioxide
TF	– Total Fluoride (Particulate & Gaseous)
VOC	– Volatile Organic Compounds