STATEMENT OF BASIS

For the issuance of Air Permit # 1987-AOP-R8 AFIN: 30-00337

1. PERMITTING AUTHORITY:

Division of Environmental Quality
5301 Northshore Drive
North Little Rock, Arkansas 72118-5317

2. APPLICANT:

Arkansas Electric Cooperative Corporation - Magnet Cove Generating Station
410 Henderson Road
Malvern, Arkansas 72104

3. PERMIT WRITER:

Amanda Leamons

4. NAICS DESCRIPTION AND CODE:

NAICS Description: Fossil Fuel Electric Power Generation
NAICS Code: 221112

5. ALL SUBMITTALS:

The following is a list of ALL permit applications included in this permit revision.

Date of Application	Type of Application (New, Renewal, Modification, Deminimis/Minor Mod, or Administrative Amendment)	Short Description of Any Changes That Would Be Considered New or Modified Emissions
1/27/2022	Renewal	None
10/6/2021	Minor Mod	None

6. REVIEWER'S NOTES:

With the minor mod AECC requested permission to upgrade the combustion turbines (SN-01 and SN-02) with Siemens Next Gen Technology. The Next Gen modifications included changes to the Rotor Air Cooling (RAC) and Fuel Gas (FG) systems, including addition of a fourth FG system manifold ("Stage D"), a pilot bypass throttle valve, and RAC startup bypass valve. Other improvements included operating software, setpoint and instrumentation changes. Actual emissions of NO_X from the combustion turbines are expected to decrease as a result of the project. All other pollutant emissions will be unchanged. All other existing units were unaffected by the change, including the duct

burners associated with SN-01 and SN-02. The proposed project did not result in an increase in actual emissions that would trigger review under the Prevention of Significant Deterioration (PSD) program.

PM/PM_{10} stack testing requirement in Specific Condition 5 was removed at the facility's request. All tests performed by AECC have previously demonstrated compliance with particulate limits at the combustion turbines/duct burners (SN-01 and SN-02). All tests were 27% or less of the hourly and BACT limits. Continuing compliance with these limits shall be demonstrated by burning only pipeline quality natural gas and maintaining records.

The ammonia testing requirement in Specific Condition 25 has also been removed. The facility operates a NO monitor on each unit to ensure the appropriate amount of NH_3 is injected into the SCR. All previous tests conducted proved compliance.

7. COMPLIANCE STATUS:

The following summarizes the current compliance of the facility including active/pending enforcement actions and recent compliance activities and issues.

There are no pending or active compliance issues or enforcement activity.

8. PSD/GHG APPLICABILITY:

a) Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, etc.)? N
If yes, were GHG emission increases significant? NA

b) Is the facility categorized as a major source for PSD? Y
- *Single pollutant ≥ 100 tpy and on the list of 28 or single pollutant ≥ 250 tpy and not on list*

If yes for 8(b), explain why this permit modification is not PSD.
There were no emission increases associated with the addition of Next Gen technology.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
SN-01 & SN-02	NO_x	NSPS Subpart GG – *Standards of Performance for Stationary Gas Turbines*
	NO_x and SO_2	NSPS Db – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units and 40 CFR Part 75 – *Acid Deposition Control*
	VOC, CO, NO_x and PM_{10}	PSD

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
SN-16 & SN-17	HAP	NESHAP Subpart ZZZZ – *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*
SN-18	PM, VOC, CO, NO_x	NSPS Subpart IIII – *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*

10. UNCONSTRUCTED SOURCES:

Unconstructed Source	Permit Approval Date	Extension Requested Date	Extension Approval Date	If Greater than 18 Months without Approval, List Reason for Continued Inclusion in Permit
N/A				

11. PERMIT SHIELD – TITLE V PERMITS ONLY:

Did the facility request a permit shield in this application? Y
(Note - permit shields are not allowed to be added, but existing ones can remain, for minor modification applications or any Rule 18 requirement.)

If yes, are applicable requirements included and specifically identified in the permit? Y
If not, explain why.

For any requested inapplicable regulation in the permit shield, explain the reason why it is not applicable in the table below.

Source	Inapplicable Regulation	Reason
01 & 02	40 C.F.R. Par 60, Subpart Da	The rated heat input capacity of duct burners is not greater than 250 MMBtu/hr
01 & 02	40 C.F.R. Par 60, Subpart Dc	The rated heat input capacity of the facility process heater is less than 10 MMBtu/hr
01 & 02	40 C.F.R. 60 Subpart KKKK	Construction of the combustion turbines was started prior to February 18, 2005, the regulation's applicability date
04 thru 15	40 C.F.R. Part 63 Subpart Q	The cooling tower does not use chromates for water treatment
Facility	40 C.F.R. 60, Subpart Kb	Vapor pressure of diesel is below regulated threshold of 3.5 kPa
Facility	40 C.F.R. Part 63, Subpart YYYY	The facility is not a major source of HAP
Facility	40 C.F.R. Part 60 Subpart JJJJ	There are no stationary spark ignition engines at the facility

Source	Inapplicable Regulation	Reason
Facility	40 C.F.R. Part 64	The combustion turbines are subject to the requirements of Acid Rain; therefore, exempt from the CAM rule 40 CFR 64.2(b)(1)(iii)

12. COMPLIANCE ASSURANCE MONITORING (CAM) – TITLE V PERMITS ONLY:

List sources potentially subject to CAM because they use a control device to achieve compliance and have pre-control emissions of at least 100 percent of the major source level. List the pollutant of concern and a brief summary of the CAM plan (temperature monitoring, CEMs, opacity monitoring, etc.) and frequency requirements of § 64.

Source	Pollutant Controlled	Cite Exemption or CAM Plan Monitoring and Frequency
N/A		

13. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

14. AMBIENT AIR EVALUATIONS:

The following are results for ambient air evaluations or modeling.

a) NAAQS

A NAAQS evaluation is not required under the Arkansas State Implementation Plan, National Ambient Air Quality Standards, Infrastructure SIPs and NAAQS SIP per Ark. Code Ann. § 8-4-318, dated March 2017 and the DEQ Air Permit Screening Modeling Instructions.

b) Non-Criteria Pollutants:

1st Tier Screening (PAER)

Estimated hourly emissions from the following sources were compared to the Presumptively Acceptable Emission Rate (PAER) for each compound. The Department has deemed the PAER to be the product, in lb/hr, of 0.11 and the Threshold Limit Value (mg/m^3), as listed by the American Conference of Governmental Industrial Hygienists (ACGIH).

Pollutant	TLV (mg/m^3)	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
Ammonia	17.4	1.91	91.42	No
Acrolein	0.23	0.0253	0.0252	Yes
Beryllium	0.00005	0.0000055	0.00000588	No
Cadmium	0.002	0.00022	0.00054	No
PAH	0.20	0.022	0.00071	Yes

2nd Tier Screening (PAIL)

AERMOD air dispersion modeling was performed on the estimated hourly emissions from the following sources, in order to predict ambient concentrations beyond the property boundary. The Presumptively Acceptable Impact Level (PAIL) for each compound has been deemed by the Department to be one one-hundredth of the Threshold Limit Value as listed by the ACGIH. Since there are no increases in hourly emissions since the previous renewal, modeling for this renewal was not performed.

Pollutant	PAIL ($\mu g/m^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu g/m^3$)	Pass?
Ammonia	174.1	8.46	Y
Beryllium	0.0005	0.0000008	Y
Cadmium	0.02	0.02	Y

c) H_2S Modeling:

A.C.A. §8-3-103 requires hydrogen sulfide emissions to meet specific ambient standards. Many sources are exempt from this regulation, refer to the Arkansas Code for details.

Is the facility exempt from the H_2S Standards N
If exempt, explain: N/A no H2S emissions

15. CALCULATIONS:

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
01-02	Vendor data BACT	PM/PM_{10} 0.013 lb/MMBtu SO_2 0.28 ppmvd @ 15% O_2 VOC 4.0 ppmvd @ 15% O_2 CO 12 ppmvd @ 15% O_2 NO_X 3.5 ppmvd @ 15% O_2 Ammonia 10 ppmvd @ 15% O_2 Ammonium Sulfate 0.06 ppmvd @ 15% O_2	SCR, and low-NO_x oxidation catalyst	70% 22%	HAP testing showed some pollutants needed higher limit than AP-42 so they have been increased, others were non-detectable but have been left in the permit at 0.1 lb/hr
	HAPS Testing CATEF AP-42 Tables 1.4-3 and 1.4-4	Based on Testing CT/HRSG/DB: Acetaldehyde 0.5 lb/hr Benzene 0.5 lb/hr Xylene 0.10 lb/hr CATEF for Turbines: 1,3 Butadiene 1.27 E-04 lb/MMscf Acrolein 2.37 E-02 lb/MMscf Ethylbenzene 1.79E-02 Hexane 2.59E-01 Propylene Oxide 4.78E-02 Toluene 7.10E-02 Formaldehyde 9.17E-01 lb/MMscf POM/PAH 2.32 E-03 lb/MMscf Naphthalene 1.66E-03 lb/MMscf AP-42 for Duct Burner Dichlorobenzene 1.2E-02 lb/MMscf Hexane 1.8 Toluene 3.4E-03 Formaldehyde 7.5E-02 lb/MMscf POM/PAH 6.98E-04 lb/MMscf Naphthalene 6.10E-04 lb/MMscf Arsenic 2.00E-04 lb/MMscf Beryllium 1.20E-05 lb/MMscf Cadmium 1.10E-03 lb/MMscf Chromium 1.40E-03 lb/MMscf Cobalt 8.40E-05 lb/MMscf Lead 5.00E-04 lb/MMscf Manganese3.80E-04 lb/MMscf Mercury 2.60E-04 lb/MMscf Nickel 2.10E-03 lb/MMscf Selenium 2.40E-05 lb/MMscf	oxidation catalyst	80%	Acetaldehyde, benzene, and xylene emission rates are based on testing
04-15	AP-42	see application	drift eliminator		0.0005 % drift 1500 ppmw TDS

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
16,17	AP-42 AP-42 Table 3.3-1 and 3.3-2	PM/PM_{10} 0.31 lb/MMBtu SO_2 0.29 lb/MMBtu VOC 0.35 lb/MMBtu CO 0.95 lb/MMBtu NO_X 4.41 lb/MMBtu 1,3 Butadiene 3.91E-05 lb/MMBtu Acrolein 9.25 E-05 lb/MMBtu Acetaldehyde 7.67 E-04 Benzene 9.33E-4 lb/MMBtu Formaldehyde 1.18E-03 lb/MMBtu PAH 1.68E-04 lb/MMBtu Toluene 4.09E-4 lb/MMBtu Xylene 2.85E-4 lb/MMBtu			1.86 MMBtu/hr and 2.73 MMBtu/hr for 16 and 17 respectively
18	Manufacturer data, AP-42 Table 3.4-3 and 3.4-4	PM/PM_{10} 0.02 g/kWh SO_2 0.02 g/kWh VOC 0.04 g/kWh CO 0.6 g/kWh NO_X 6.2 g/kWh Acetaldehyde 2.52 E-05 lb/MMBtu Acrolein 7.88 E-06 lb/MMBtu Benzene 7.76 E-04 lb/MMBtu Formaldehyde 7.89 E-05 lb/MMBtu PAH 2.12 E-04 lb/MMBtu Toluene 2.81 E-04 lb/MMBtu Xylene 1.93 E-04 lb/MMBtu			17.8 MMBtu/hr

16. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutants	Test Method	Test Interval	Justification
SN-01 or SN-02	VOC	25A	5 yr	Confirmation of BACT limit(s)

17. MONITORING OR CEMS:

The permittee must monitor the following parameters with CEMS or other monitoring equipment (temperature, pressure differential, etc.)

SN	Parameter or Pollutant to be Monitored	Method (CEM, Pressure Gauge, etc.)	Frequency	Report (Y/N)
01 & 02	NO_x	CEMS	Continuously	Y
01 & 02	CO	CEMS	Continuously	Y

18. RECORDKEEPING REQUIREMENTS:

The following are items (such as throughput, fuel usage, VOC content, etc.) that must be tracked and recorded.

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
01-02	sulfur content of fuel	0.015% by volume at 15% oxygen on a dry basis	Daily	Y
01-02	combined hours of duct burner fire	5,000 hr/yr total	Monthly	Y
01-02	Startup/Shutdown	N/A	Each Occurrence	N
04-15	TDS or conductivity	1,500 ppmw	Monthly or If conductivity weekly	Y
16,17	Operating hours	500 hours each, calendar annual	Monthly	N
18	Operating hours	500 hours, rolling 12-month	Monthly	N

19. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
01-02	5%	Dept. Standard while firing natural gas	Use of natural gas
04-15	20%	Standard for cooling towers	TDS limit
16-17	20%	Rule 19.503	Annual Observation
18	20%	Rule 19.503	Annual Observation

20. DELETED CONDITIONS:

Former SC	Justification for removal
5	Removed 5yr PM/PM_{10} testing requirement – facility has proven compliance and the units burn only Natural Gas
25	Removed ammonia testing – facility has repeatedly proven compliance and shown that actual emissions are much lower than the permit limits.

21. GROUP A INSIGNIFICANT ACTIVITIES:

The following is a list of Insignificant Activities including revisions by this permit.

Source Name	Group A Category	Emissions (tpy)						
		PM/PM_{10}	SO_2	VOC	CO	NO_x	HAPs	
							Single	Total
Process Heater	A-1	0.31	0.03	0.24	3.61	4.29		0.08
320 gallon Diesel Tank	A-3			0.0003				
EDGE Diesel Storage	A-3			0.0006				
Stand-by Engine Diesel Fuel Tank	A-3			0.0006				
1000 gallon mobile equip diesel tank	A-3			0.0004				
Miscellaneous Oil Storage	A-13			4e-6				

22. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

The following is a list of all active permits voided/superseded/subsumed by the issuance of this permit.

Permit #
1987-AOP-R7

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

Fee Calculation for Major Source

Revised 03-11-16

Facility Name: Arkansas Electric Cooperative Corporation - Magnet Cove Generating Station
Permit Number: 1987-AOP-R8
AFIN: 30-00337

$/ton factor	25.13	Annual Chargeable Emissions (tpy)	945.4
Permit Type	Modification	Permit Fee $	1000

Minor Modification Fee $	500
Minimum Modification Fee $	1000
Renewal with Minor Modification $	500
Check if Facility Holds an Active Minor Source or Minor Source General Permit	☐
If Hold Active Permit, Amt of Last Annual Air Permit Invoice $	0
Total Permit Fee Chargeable Emissions (tpy)	0
Initial Title V Permit Fee Chargeable Emissions (tpy)	

HAPs not included in VOC or PM: *Chlorine, Hydrazine, HCl, HF, Methyl Chloroform, Methylene Chloride, Phosphine, Tetrachloroethylene, Titanium Tetrachloride*

Air Contaminants: *All air contaminants are chargeable unless they are included in other totals (e.g., H2SO4 in condensible PM, H2S in TRS, etc.)*

Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
PM		240.4	240.4	0		
PM_{10}		240.4	240.4	0	0	240.4
$PM_{2.5}$		0	0	0		
SO_2		13.7	13.7	0	0	13.7
VOC		70.8	70.8	0	0	70.8
CO		616.5	616.5	0		
NO_X		302.9	302.9	0	0	302.9

Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
Total HAPs	☐	16.93	15.64	-1.29		
Ammonia	☑	311.6	311.6	0	0	311.6
Ammonia Sulfate	☑	6	6	0	0	6