

STATEMENT OF BASIS

For the issuance of Draft Air Permit # 1936-AOP-R3 AFIN: 30-00229

1. PERMITTING AUTHORITY:

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

2. APPLICANT:

KGen Power Corporation - KGen Hot Spring, LLC
696 Black Branch Road
Malvern, Arkansas 72104

3. PERMIT WRITER:

Patty Campbell, PE

4. PROCESS DESCRIPTION AND NAICS CODE:

NAICS Description: Electric Power Generation
NAICS Code: 221112

5. SUBMITTALS:

7/1/2008

6. REVIEWER'S NOTES:

KGen Hot Spring, LLC is a subsidiary of Duke Energy Generation Services of Houston, Texas. KGen Hot Spring, LLC is a 1240-MW gas turbine/steam turbine combined-cycle electric power plant (NAICS 221112) located at 696 Black Branch Road, Malvern, Hot Spring County, Arkansas 72104. This permitting action is necessary to incorporate the Clean Air Interstate Rule (CAIR) into the facility's permit. There is no emission change associated with this permitting action.

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 active or pending enforcement issues at this time.

8. PSD APPLICABILITY:

a. Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, etc.)? N

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, explain why this permit modification not PSD?

This was a modification to insert the new Clean Air Interstate Rule (CAIR) into the permit.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
SN-01 through SN-04	SO ₂ , VOC, CO, NO _x , and PM/PM ₁₀	NSPS Subpart GG (NO _x and SO ₂ only) PSD (all pollutants listed)
SN-01 through 04	PM/PM ₁₀ , SO ₂ , NO _x	NSPS Subpart Da
SN-05 and 06	records only	NSPS Subpart Da

10. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

11. MODELING:

Criteria Pollutants

Air Quality Analysis Prior Permit #1936-AOP-R2

As part of the PSD permitting procedure a new source must perform an air quality analysis to assess impact to local NAAQS and to evaluate the increment consumption. The first step in this review is to evaluate the impact of pollutants that will increase by PSD significant levels. In this case, the pollutants evaluated are PM₁₀, NO₂, SO₂, and CO. SCREEN3 dispersion modeling was used in the case of each pollutant. For NO_x (annually averaged) and PM₁₀ (24-hour and annually averaged) ISCST3 modeling procedures were used because the SCREEN3 results exceeded or nearly exceeded PSD modeling significant impacts. The dispersion modeling shows that these pollutants do not exceeded significant impact levels; therefore, multi-source refined modeling is not necessary to satisfy PSD requirements. The following table summarizes the results of dispersion modeling.

Pollutant		PSD Modeling Significant Impact	Impact from HS Energy
PM10	annual	1	0.525
	24-hour	5	4.64
NO ₂	annual	1	0.746
SO ₂	annual	1	0.826
	24-hour	5	4.26
	3-hour	25	9.59
CO	8-hour	500	91.0
	1-hour	2000	130

Ozone formation near the facility could result from the emissions of NO_x and VOCs. Scheffe Screening Tables are often used in this case as an initial step to estimating levels of ozone formation. In this case, the rural based ozone impact predicted by Scheffe tables is less than 0.02 ppm averaged annually. The local background ozone level in this area in nearby Montgomery County is 0.092 ppm; therefore, it can be assumed that the facility will have no noticeable impact.

Non-Criteria - *HAPs and Ammonia*

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/m³), as listed by the American Conference of Governmental Industrial Hygienists (ACGIH). This analysis shows that most non-criteria pollutants passed the first level of modeling (except acetaldehyde, ammonia, and formaldehyde). PAER from Permit #1936-AOP-R2.

Pollutant	TLV (mg/m ³)	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
Ammonia	94.0	17.3	1.91	No
1,3-Butadiene	4.4	0.484	0.04	Yes
Acetaldehyde	45	4.95	0.32	Yes
Acrolein	0.23	0.025	0.08	No

Pollutant	TLV (mg/m ³)	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
Benzene	32	3.52	0.14	Yes
Ethylbenzene	434	47.74	0.28	Yes
Formaldehyde	1.5	0.165	2.10	No
Hexane	176	19.36	0.34	Yes
Propylene Oxide	48	5.28	0.24	Yes
Toluene	188	20.68	1.06	Yes
Xylene	434	47.74	0.52	Yes
POM*	52.4	5.76	0.04	Yes
Arsenic	0.01	0.0011	5.19E-05	Yes
Cadmium	0.01	0.0011	2.58E-03	Yes
Chromium	0.01	0.0011	3.29E-03	Yes
Mercury	0.01	0.0011	6.10E-04	Yes
Lead	1.5	0.165	0.01	Yes

- Naphthalene used as representative POM

2nd Tier Screening (PAIL)

These two species are modeled with ISCST3 dispersion methods to show compliance with the Presumptively Acceptable Impact Level (PAIL). 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.

Pollutant	PAIL (µg/m ³) = 1/100 of Threshold Limit Value	ISCST3 Modeled Concentration (µg/m ³)	Pass?
Ammonia	173	1.79	Yes
Acrolein	450	0.01	Yes
Formaldehyde	15	0.03	Yes

12. CALCULATIONS:

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
01-04	Vendor data for criteria, and AP-42 for HAPs. 10 ppm for ammonia slip.	emission factors can be found in the permit BACT determinations	SCR, and low-NO _x		From permit #1936-AOP-R2
05-06	Vendor data for criteria, and AP-42 for HAPs.	emission factors can be found in the permit BACT determinations	low-NO _x		From permit #1936-AOP-R2
07-30	AP-42	see application	drift elimination design		0.005 % drift 1280 ppmw TDS From permit #1936-AOP-R2
32-33	Vendor data for criteria	see application	NA		From permit #1936-AOP-R2

13. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutants	Test Method	Test Interval	Justification
2 of SN-01 through 04 and 03 and 04 if built	PM/PM ₁₀	5 and 202 and/or 201A&202	5 yrs	Confirmation of BACT limit(s)
	VOC	25A	5 yrs	Confirmation of BACT limit(s)
03 and 04 if built	CO	10	Initial	Confirmation of BACT limit(s)
	NO _x	7E	Initial	Confirmation of BACT limit(s)
01 through 04	NH ₃	206	5 yrs	To assure facility accurately estimated emissions

14. 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)
01-04	NO _x	CEMS	Continuously	Y
	CO	CEMS	Continuously	Y

15. 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)
01-04	natural gas only	NA	verify per inspection	Y
05-06	individual hours of boiler fire	2,000 hr/yr each	monthly	Y
07-30	TDS	1280 ppmw	monthly	Y
32-33	hours of engine fire	500 hrs per year each	monthly	Y

16. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
01-06	5%	Dept. Standard while firing natural gas	Use of natural gas.
07-30	20%	Standard for cooling towers	TDS limit
32-33	20%	Standard for diesel	Use of diesel

17. DELETED CONDITIONS:

Former SC	Justification for removal
None identified.	

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18. GROUP A INSIGNIFICANT ACTIVITIES

This is a CAIR revision only.

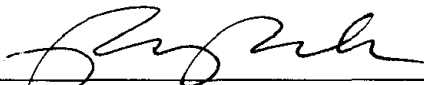
19. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

List all active permits voided/superseded/subsumed by the issuance of this permit.

Permit #
1936-AOP-R2

20. CONCURRENCE BY:

The following supervisor concurs with the permitting decision.



Paula Parker, P.E.

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

Fee Calculation for Major Source

Facility Name: Kgen Hot Springs, LLC
 Permit Number: 1936-AOP-R3
 AFIN: 30-00229

\$/ton factor	22.07	Annual Chargeable Emission (tpy)	2196.8
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 Permit	<input type="checkbox"/>
If Hold Active Permit, Amt of Last Annual Air Permit Invoice \$	0
Total Permit Fee Chargeable Emissions (tpy)	0

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 condensable 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	<input checked="" type="checkbox"/>	524.2	524.2	0	0	524.2
PM ₁₀	<input type="checkbox"/>	489.6	489.6	0		
SO ₂	<input checked="" type="checkbox"/>	214.8	214.8	0	0	214.8
VOC	<input checked="" type="checkbox"/>	328.2	328.2	0	0	328.2
CO	<input type="checkbox"/>	1928	1928	0		
NO _x	<input checked="" type="checkbox"/>	539.2	539.2	0	0	539.2
Lead	<input type="checkbox"/>	0.06	0.06	0		
1,2-butadiene	<input type="checkbox"/>	0.04	0.04	0		
acetaldehyde	<input type="checkbox"/>	1.28	1.28	0		
acrolein	<input type="checkbox"/>	0.2	0.2	0		

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benzene	┌	0.42	0.42	0		
ethylbenzene	┌	1	1	0		
formaldehyde	┌	8.38	8.38	0		
hexane	┌	1.34	1.34	0		
propylene oxide	┌	0.92	0.92	0		
toluene	┌	4.1	4.1	0		
xylene	┌	2	2	0		
POM	┌	0.08	0.08	0		
arsenic	┐	0.06	0.06	0		
cadmium	┌	0.06	0.06	0		
chromium	┌	0.06	0.06	0		
mercury		0.06	0.06	0		
ammonia		590.4	590.4	0	0	590.4
		0	0	0		
		0	0	0		

2/2/2009