

STATEMENT OF BASIS

For the issuance of Draft Air Permit # 0573-AOP-R10 AFIN: 70-00040

1. PERMITTING AUTHORITY:

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

2. APPLICANT:

El Dorado Chemical Company
4500 North West Avenue
El Dorado, Arkansas 71730

3. PERMIT WRITER:

Joseph Hurt

4. PROCESS DESCRIPTION AND NAICS CODE:

NAICS Description: Nitrogenous Fertilizer Manufacturing
NAICS Code: 325311

5. SUBMITTALS:

2/27/2009

6. REVIEWER'S NOTES:

El Dorado Chemical Company (EDCC) owns and operates a chemical manufacturing facility located at 4500 North West Avenue in El Dorado, Arkansas. With this modification the facility requested:

1. Revisions to particulate matter (PM/PM₁₀) monitoring requirements for the E2 Plant Chemical Steam Scrubber (SN-41) based on the Environmental Protection Agency's (EPA's) position on condensable PM in the recently released New Source Review (NSR) implementation rule for PM_{2.5}.
2. Relocation of the Ammonium Nitrate (AN) Solution Loading facility (SN-40).
3. Removal of the obsolete Sampling Method for SN-41 (Appendix D) from the permit.
4. Revisions to the PM/PM₁₀ stack testing requirements for the KT LDAN Dryer/Cooler (SN-15) based on EPA's current position on condensable PM.

5. Corrections to compliance demonstration references for various specific conditions related to the E2 Ammonium Nitrate Plant, KT Ammonium Nitrate Plant, Natural Gas Fired Boilers, and the Magnesium Oxide Silo Baghouse.

This modification authorizes all of the above requests except for #1. Revisions to a BACT limit requires PSD review, as such the BACT limit will remain until modified by a PSD application. There are no permitted emission changes with this modification.

7. COMPLIANCE STATUS:

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

The last inspection, performed on January 29, 2009, indicated that the facility was still operating under an active CAO (CAO LIS 08-134). Per Ron Allen on 02/05/09 – the facility is to submit for a period of 3 months CEMs related data such as QA/QC and other related CEMs activities until March 20, 2009.

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?

The permit modification does not include any net emission increases above PSD thresholds.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
SN-13	NO _x	NSPS, Subpart G
SN-41	PM ₁₀	PSD
SN-07	SO ₂ and sulfuric acid mist	NSPS, Subpart H

10. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

11. MODELING:

Criteria Pollutants

Pollutant	Emission Rate (lb/hr)	NAAQS Standard ($\mu\text{g}/\text{m}^3$)	Averaging Time	Highest Concentration ($\mu\text{g}/\text{m}^3$)	% of NAAQS
PM ₁₀	161.6	50	Annual	32.0*	64 %
		150	24-Hour	91.4*	60.9 %
SO ₂	601.7	80	Annual	12.5	15 %
		1300	3-Hour	444	34 %
		365	24-Hour	119	32 %
VOC	18.5	0.12	1-Hour (ppm)	N/A	N/A
CO	12.0	10,000	8-Hour	N/A	N/A
		40,000	1-Hour	N/A	N/A
NO _x	592.2	100	Annual	13.97	19%
Pb	--	0.15	Rolling 3-month Period over 3 years (not to be exceeded in any 3 month period)	N/A	N/A

* - Background ($24 \mu\text{g}/\text{m}^3$ for annual average, $39 \mu\text{g}/\text{m}^3$ for 24-hour average) are included to the modeled concentration.

Note: No modeling was performed with this modification.

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) = $0.11 \times \text{TLV}$	Proposed lb/hr	Pass?
Hexane	176.2	19.3	0.6	Yes

Pollutant	TLV (mg/m ³)	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
HNO ₃	5.1	0.567	16.8	NO
H ₂ SO ₄	0.2	0.022	4.72	NO
NH ₃	17.4	1.9	168.8	NO

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.

Pollutant	PAIL (µg/m ³) = 1/100 of Threshold Limit Value	Modeled Concentration (µg/m ³)	Pass?
HNO ₃	51.0	4.8	Yes
H ₂ SO ₄	2.0	0.95	Yes
NH ₃	174	56.2	Yes

Other Modeling:

Odor:

Odor modeling for sources emitting styrene.

Pollutant	Threshold value 1-hour average	Modeled Concentration (µg/m ³)	Pass?
Styrene	1361 µg/m ³	N/A	N/A

H₂S 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 H₂S Standards

Y

If exempt, explain: N/A

Pollutant	Threshold value	Modeled Concentration (ppb)	Pass?
H ₂ S	20 parts per million (5-minute average*)	N/A	N/A
	80 parts per billion (8-hour average) residential area	N/A	N/A
	100 parts per billion (8-hour average) nonresidential area	N/A	N/A

*To determine the 5-minute average use the following equation

$$C_p = C_m (t_m/t_p)^{0.2} \text{ where}$$

C_p = 5-minute average concentration

C_m = 1-hour average concentration

t_m = 60 minutes

t_p = 5 minutes

12. CALCULATIONS:

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
05	Testing	$PM_{10} - 13.0$ lb/hr, 0.96 lb of PM_{10} per ton of ammonium nitrate produced. With SN-17's exhaust routed to SN-05 21.6 lb/hr x $(1-0.95) = 1.1$ lb/hr PM	Brinks Scrubber	-	97% particulate control efficiency. 95% particulate control efficiency is used in calculations as Brinks scrubber control efficiencies for the exhaust from SN-17 passing thru Brinks scrubber.
	Engineering Estimate	$3.5 + 5.0 = 8.5$ lb/hr NH_3	Brinks Scrubber	-	-
06	Testing	$PM_{10} - 67.0$ lb/hr, 0.96 lb of PM_{10} per ton of ammonium nitrate produced.	-	-	Uncontrolled. Maximum prill production rate is 54 tons/hour.
07	Testing	$SO_2 - 600$ lb/hr	Brinks Mist Eliminator	-	Remain the previous permitted limit
	Testing	$H_2SO_4 - 0.123$ lb/ton	Brinks Mist Eliminator	-	-
08	Testing	$NO_x - 200.1$ lb/hr Ammonia - 40.0 lb/hr	Refrigeration SCR	~98.5%	11.5 lb/ton x 17.4 ton/hr = 200.1 lb/hr

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
09	Testing	NO _x - 200.1 lb/hr Ammonia - 40.0 lb/hr	Refrigeration SCR	~98.5%	11.5 lb/ton x 17.4 ton/hr = 200.1 lb/hr
10	AP-42	NO _x - 10.0 lb/ton	best operation	-	-
	Highest lb/hr from Stack Test results of 2001-2004	HNO ₃ - 0.389 x 1.25 x 40/8.5 = 2.3 lb/hr +1.1 lb/hr from car barn NO _x - 3.3 x 1.25 x 40/8.5 = 19.5 lb/hr	-	-	Maximum nitric acid production rate is 8.5 tons/hr, and maximum nitric acid blend production is 40 tons/hr. Stack test + 25% safety factor.
13	NSPS	3.0 lb/ton of acid	refrigerated absorption	-	-
14	Testing	PM ₁₀ - 44.2 lb/hr	none	-	Hourly emission rate increase as a result of a fail stack testing. 44.2 lb/hr is based on March 2, 2004 stack test data. Average + Std. Deviation = 36.18 + 8.0
15	Testing	PM ₁₀ - 17.0 lb/hr	none	-	-
	Testing	NH ₃ - 18.0 lb/hr	none	-	-

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
16A & 16B	AP-42	PM ₁₀ – 7.6 lb/MMSCF SO ₂ – 0.6 lb/MMSCF VOC – 5.5 lb/MMSCF CO – 84 lb/MMSCF NO _x - 280 lb/MMSCF	none	-	-
17	Testing	PM ₁₀ – 21.6 lb/hr	Pease-Anthony Scrubber	-	Routed to SN-05
	Testing	NH ₃ – 5.0 lb/hr	Pease-Anthony Scrubber	-	Routed to SN-05
18	Process Knowledge	PM ₁₀ – 0.033 lb/ton	Baghouse	-	-
19	PM – 50,556 scfm x 011677 lb/mmft ³ x 60 min/hr x 1.2 NH ₃ - 50,556 scfm x 25 ppm x 17.1 lb/lb-mol x lb-mol/385.2 ft ³ 60min/hr x 1.2	-	-	-	
21	Testing	PM ₁₀ – 0.1 lb/ton	Brinks Scrubber	-	-
	Testing	NH ₃ – 1.0 lb/ton	Brinks Scrubber	-	-

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
22	CEM	NO _x - 3.0 lb/ton	cryogenic absorption	-	-
	Process Knowledge	HNO ₃ - 10.0 lb/hr	cryogenic absorption	-	-
25	TANKS3	VOC	none	-	-
26	TANKS3	NH ₃	none	-	-
27	AP-42	PM ₁₀ - 0.0001 lb/ton	none	-	-
28	AP-42	PM ₁₀ - 0.0001 lb/ton	none	-	-
29	AP-42	HNO ₃ - 0.53 lb/1000 gallons	none	-	-
30	AP-42 Section 5.2	H ₂ SO ₄ - 0.0281 lb/1000 gallons	none	-	$L_L = 12.46 \times \text{SPM/T}$ $= 12.46 \times 1.45 \times 0.01 \times 98.06/630$
31	SOCMI	NH ₃ - 0.5 lb/hr	none	-	-
32	SOCMI	NH ₃ - 1.3 lb/hr	none	-	-
33	Process Knowledge	NO _x - 1.9 lb/hr	none	-	-
	Process Knowledge	HNO ₃ - 1.8 lb/hr	none	-	-
34	Process Knowledge	PM ₁₀ - 0.7 lb/ton x 1.16 ton/hr	none	-	-
35	Process Knowledge	PM ₁₀ - 2.0 lb/hr	baghouse	99%	-

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
38	$EF_{PM} = \text{Total liquid drift (lb/1000 gal)} \times \text{TDS Fraction (ppm)}$ $= 1.7 \text{ lb/1000 gal} \times 1,560 \text{ ppm}$ $PM_{10} = EF_{PM} \times \text{flowrate}$ $= 9,000 \text{ gpm} \times EF_{PM}$			0.17 lb/1000 gal is design drift loss percent provided by AP-42. Table 13.4-1	
39	$EF_{PM} = \text{Total liquid drift (lb/1000 gal)} \times \text{TDS Fraction (ppm)}$ $= 1.7 \text{ lb/1000 gal} \times 1,560 \text{ ppm}$ $PM_{10} = EF_{PM} \times \text{flowrate}$ $= 14,000 \text{ gpm} \times EF_{PM}$			1.7 lb/1000 gal is design drift loss percent provided by AP-42. Table 13.4-1	
40	Engineering estimate	NH ₃ – 1.6 lb/hr during loading			1.6 lb/hr per truck x 2 trucks per day
41	Stack testing	NH ₃ – 10.0 lb/hr PM/PM10 – 3.3 lb/hr	Chemical steam scrubber	-	-

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
42	$EF_{PM} = \text{Total liquid drift (lb/1000 gal)} \times \text{TDS Fraction (ppm)}$ $= 0.17 \text{ lb/1000 gal} \times 1,560 \text{ ppm}$ $PM_{10} = EF_{PM} \times \text{flowrate}$ $= 16,000 \text{ gpm} \times EF_{PM}$	-	-	0.17 lb/1000 gal is design drift loss percent provided by manufacturer.	
43	$EF_{PM} = \text{Total liquid drift (lb/1000 gal)} \times \text{TDS Fraction (ppm)}$ $= 1.7 \text{ lb/1000 gal} \times 1,560 \text{ ppm}$ $PM_{10} = EF_{PM} \times \text{flowrate}$ $= 2,000 \text{ gpm} \times EF_{PM}$			1.7 lb/1000 gal is design drift loss percent provided by AP-42. Table 13.4-1	
44	<p>Mass Balance for sulfur oxides and sulfuric acid.</p> <p>Stack test from similar plant plus a safety factor of 25%.</p>	Scrubber	-	-	
46	$3000 \text{ gpm} \times 0.000064 \times 1,560 \text{ ppm} = 0.2 \text{ lb/hr } PM_{10}$	-	-	0.0064% is design drift loss percent provided by manufacturer.	

13. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutants	Test Method	Test Interval	Justification
10	NO _x	7E	Every five years	Necessary for efficiency check on Venturi & Packed Tower Scrubber
10	HNO ₃	Approved method	Every five years	Necessary for efficiency check on Venturi & Packed Tower Scrubber
07	SO ₂	6C	Initial performance test	NSPS Requirement
05	PM ₁₀	Approved method	Every five years to do an analysis. See Specific Condition 64.	Necessary to prove that PSD has not been triggered.
17	NH ₃	Approved Method	Every five years or upon failure, pass two consecutive stack testings to go back to the five years cycle.	Necessary to prove that PSD has not been triggered.
15, 14, & 21	PM ₁₀	Method 5	Every five years	Necessary to prove that PSD has not been triggered.
15	NH ₃	Approved method	Yearly	Necessary to prove adherence to the non-criteria pollutant strategy.
21	NH ₃	Approved method	Every five years	Necessary to prove adherence to the non-criteria pollutant strategy.
44	SO ₂ NO _x H ₂ SO ₄ HNO ₃	Approved method	Every five years	Necessary to prove adherence to the non-criteria pollutant strategy.
08 & 09	NH ₃	CTM-027	Every five years	Verify 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	Frequency	Report (Y/N)
13 & 22	NO _x emission rate	CEM	Continuously	Y
07	SO ₂ emission rate	CEM	Continuously	Y
08 & 09	NO _x emission rate	CEM	Continuously	Y
41	Ammonia and particulate emission rates	Daily two 12-hour composite sample	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)
08 & 09	weak nitric acid production	304,775 tons/12 months	monthly	Y
13	weak nitric acid production	140,000 tons/12 months	monthly	Y
22, 10, & Facility	concentrated nitric acid production	SN-22 - 118,260 tons/12 months;	monthly	Y
10	Scrubber parameter	hydrogen peroxide concentration	daily	N
29	nitric acid shipped	200,000 tons/12 months	monthly	Y
07	Sulfuric acid production	200,750 ton/12 months		
30	sulfuric acid shipped	200,750 tons/12 months	monthly	Y
All E2 Plant	Production	473,040 tons/12 months	Monthly	Y

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
05	Scrubber liquid flow rate for each scrubber Gas pressure drop across unit Scrubber liquid pH	225 gal/min (minimum) 2.5 in. H ₂ O (minimum) 0.5 – 4.5	daily	N
17	Scrubber liquid flow rate (dual scrubber) pH Amperage	120 gal/min (minimum) 0.5 – 6.0 100 amp (minimum)	daily	N
All KT plant	production	252,000 tons/12 months	monthly	Y
25	usage of gasoline	40,000 gallons/12 months	monthly	Y
37	minimum gas pressure	10 in. H ₂ O (minimum)	When scrubber in operation	N
38	Total Dissolve solid	1,560 ppm	weekly	N
39	Total Dissolve solid	900 ppm	weekly	N
40	Loading tonnage	no more than 468,660 tons	monthly	N
42	Total Dissolve solid	1,560 ppm	weekly	N
43	Total Dissolve solid	1,560 ppm	weekly	N
46	Total Dissolve solid	1,560 ppm	weekly	N

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
44	Amount of Oleum offload into the storage tank Percent strength of the Oleum Amount of mixed acid produced.	394,000 tons 65% 219,000 tons	monthly	N

16. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
08 & 09	10%	Compliance assurance for SCR operation	daily observation
13	10%	NSPS limit	daily observation
10	20%	Previous permit	daily observation
07	10%	Previous permit	daily observation
12 & 18	5%	Department Guidance	daily observation
21	10%	Previous permit	daily observation
14	15%	Previous permit	daily observation
05, 11, & 15	20%	Previous permit	daily observation
06, 27, & 28	25%	Previous permit	daily observation
41	15%	Department Guidance	daily observation

17. DELETED CONDITIONS:

Former SC	Justification for removal
	N/A

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18. GROUP A INSIGNIFICANT ACTIVITIES

Source Name	Group A Category	Emissions (tpy)						
		PM/PM ₁₀	SO ₂	VOC	CO	NO _x	HAPs	
							Single	Total
No new Insignificant activities were added with this modification.								


19. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

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

Permit #
0573-AOP-R9

20. CONCURRENCE BY:

The following supervisor concurs with the permitting decision.



Thomas Rheaume, P.E.

Fee Calculation for Major Source

Facility Name: El Dorado Chemical Company
 Permit Number: 0573-AOP-R10
 AFIN: 70-00040

\$/ton factor	22.07	Annual Chargeable Emissions (tpy)	3678.55
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	☐
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)	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	☑	334	334	0	0	334
PM ₁₀	☐	334	334	0		
SO ₂	☑	408.3	408.3	0	0	408.3
VOC	☑	4.5	4.5	0	0	4.5
CO	☐	52.3	52.3	0		
NO _x	☑	2410.2	2410.2	0	0	2410.2
Hexane*	☐	1.2	1.2	0		
HNO ₃	☑	67.6	67.6	0	0	67.6
H ₂ SO ₄	☑	19.15	19.15	0	0	19.15
NH ₃	☑	434.8	434.8	0	0	434.8