STATEMENT OF BASIS

for the issuance of Draft Air Permit # 0573-AOP-R9

1. PERMITTING AUTHORITY:

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

2. APPLICANT:

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

3. **PERMIT WRITER:**

Siew Low

4. PROCESS DESCRIPTION AND NAICS CODE:

NAICS Description: Nitrogenous Fertilizers Manufacturing; All Other Basic Inorganic Chemical Manufacturing NAICS Code: 325311; 325188

- 5. SUBMITTALS: September 11, 2008 and September 22, 2008
- 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. This minor modification authorizes the installation of the sulfuric acid cooling tower (SN-46). This mechanically induced, cross-flow draft cooling tower is an integral part of the double absorption process required by CAO LIS 03-175 (December 31, 2003). The potential emissions increase from this modification is 0.7 tpy of PM/PM₁₀.
- 7. COMPLIANCE STATUS: The following summarizes the current compliance status of the facility including active/pending enforcement actions and recent compliance activities and issues.

Last date of inspection was July 18, 2008. The facility was found out of compliance because excessive CEMs downtime at SN-08 and SN-09.

Permit #: 0573-AOP-R8 AFIN #: 70-00040 Page 2 of 15 8. APPLICABLE REGULATIONS:

A. Applicability

Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, et cetera) (Y/N) Y Has this facility underwent PSD review in the past (Y/N) Y Permit # <u>0573-AOP-R6</u> Is this facility categorized as a major source for PSD? (Y/N) Y \exists 100 tpy and on the list of 28 (100 tpy)? (Y/N) Y \exists 250 tpy all other (Y/N)

B. PSD Netting

Was netting performed to avoid PSD review in this permit? (Y/N) N

C. Source and	l Pollutant Specific	Regulatory Applicability
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Source	Pollutant	Regulation [NSPS, NESHAP (Part 61 & Part 63), or PSD <u>only</u>]
SN-13	NO _x	NSPS Subpart G
SN-41	PM ₁₀	PSD
SN-07	SO ₂ and sulfuric acid mist	NSPS Subpart H

9. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

10. MODELING:

A. Criteria Pollutants

Pollutant	Emission Rate (lb/hr)	NAAQS Standard (µg/m ³)	Averaging Time	Highest Concentration (µg/m ³)	% of NAAQS
		50	Annual	32.0*	64%
PM ₁₀	161.6	150	24-hour	91.4*	60.9%

Permit #: 0573-AOP-R8 AFIN #: 70-00040 Page 3 of 13

Pollutant	Emission Rate (lb/hr)	NAAQS Standard (µg/m ³)	Averaging Time	Highest Concentration (µg/m ³)	% of NAAQS
		80	Annual	12.5	15%
		1,300	3-hour	444	34%
SO_2	601.7	365	24-hour	119	32%
NO _X	592.2	100	Annual	13.97	19%
VOC	18.5	0.12	1-hour (ppm)	NA	0%
		10,000	8-hour	NA	0%
CO	12.0	40,000	1-hour	NA	0%

* - Background (24 ug/m³ for annual average, 39 ug/m³ for 24-hour average) are included to the modeled concentration.

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 PAER was deemed by the Department 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?
HNO ₃	5.15	0.5665	16.8	No
H ₂ SO ₄	0.2	0.022	4.72	No
NH ₃	17.41	1.915	168.8	No
Hexane	1762	193	0.6	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.

Permit #: 0573-AOP-R8 AFIN #: 70-00040 Page 4 of 13

Pollutant	PAIL $(\mu g/m^3) = 1/100$ of Threshold Limit Value	Modeled Concentration $(\mu g/m^3)$	Pass ?
HNO ₃	51.5	4.8	Yes
H ₂ SO ₄	2	0.95	Yes
NH ₃	174.1	56.2	Yes

11. CALCULATIONS:

SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/unco ntrolled, etc)
SN-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.
SN-05	Engineering Estimate	3.5 + 5.0 = 8.5 lb/hr NH ₃	Brinks Scrubber	-	-
SN-06	Testing	$PM_{10} - 67.0 \text{ lb/hr},$ 0.96 lb of PM_{10} per ton of ammonium nitrate produced.	-	-	Uncontrolled. Maximum prill production rate is 54 tons/hour.
			Brinks Mist		Remain the

SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/unco ntrolled, etc)
SN-07	Testing	SO ₂ – 600 lb/hr	Eliminator	-	previous permitted limit
SN-07	Testing	$H_2SO_4 - 0.123$ lb/ton	Brinks Mist Eliminator	-	-
SN-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-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
SN-10	AP-42	NO_X - 10.0 lb/ton	best operation	-	-
SN-10	Highest lb/hr from Stack Test results of 2001-2004	$HNO_{3} - 0.389 \times 1.25 \times 40/8.5 = 2.3 \text{ lb/hr} + 1.1 \text{ lb/hr from car barn} NO_{X} - 3.3 \times 1.25 \times 40/8.5 = 19.5 \text{ lb/hr}$		-	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.
SN-13	NSPS	3.0 lb/ton of acid	refrigerated absorption	-	-
SN-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

Permit #: 0573-AOP-R8 AFIN #: 70-00040 Page 6 of 13

SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/unco ntrolled, etc)
					data. Average + Std. Deviation = 36.18 + 8.0
SN-15	Testing	PM ₁₀ – 17.0 lb/hr	none	-	-
SN-15	Testing	NH ₃ – 18.0 lb/hr	none	-	-
SN-16A	AP-42	$\begin{array}{l} PM_{10}-7.6 \ lb/MMSCF\\ SO_2-0.6 \ lb/MMSCF\\ VOC-5.5 \ lb/MMSCF\\ CO-84 \ lb/MMSCF\\ NO_X \ - 280 \ lb/MMSCF \end{array}$	none	-	-
SN-16B	AP-42	$\begin{array}{l} PM_{10}-7.6 \ lb/MMSCF\\ SO_2-0.6 \ lb/MMSCF\\ VOC-5.5 \ lb/MMSCF\\ CO-84 \ lb/MMSCF\\ NO_X \ - 280 \ lb/MMSCF \end{array}$	none	-	-
SN-17	Testing	PM ₁₀ – 21.6 lb/hr	Pease-Anthony Scrubber	-	Routed to SN-05
SN-17	Testing	NH ₃ 5.0 lb/hr	Pease-Anthony Scrubber	-	Routed to SN-05
SN-18	Process Knowledge	PM ₁₀ – 0.033 lb/ton	Baghouse	-	-
SN-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		-	-	-

Permit #: 0573-AOP-R8 AFIN #: 70-00040 Page 7 of 13

SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/unco ntrolled, etc)
SN-21	Testing	PM ₁₀ – 0.1 lb/ton	Brinks Scrubber	-	-
SN-21	Testing	NH ₃ – 1.0 lb/ton	Brinks Scrubber	-	-
SN-22	СЕМ	NO _X - 3.0 lb/ton	cryogenic absorption	-	-
SN-22	Process Knowledge	HNO3 – 10.0 lb/hr	cryogenic absorption	-	-
SN-25	TANKS3	VOC	none	-	-
SN-26	TANKS3	NH ₃	none	-	-
SN-27	AP-42	PM ₁₀ – 0.0001 lb/ton	none	-	-
SN-28	AP-42	PM ₁₀ – 0.0001 lb/ton	none	-	_
SN-29	AP-42	HNO ₃ – 0.53 lb/1000 gallons	none	-	-
SN-30	AP-42 Section 5.2	H ₂ SO ₄ – 0.0281 lb/1000 gallons	none	-	$L_{L} = 12.46 x$ SPM/T =12.46 x 1.45 x 0.01 x 98.06/630
SN-31	SOCMI	NH ₃ – 0.5 lb/hr	none	-	-
SN-32	SOCMI	NH ₃ – 1.3 lb/hr	none	-	-
SN-33	Process Knowledge	$NO_X - 1.9$ lb/hr	none	-	-
SN-33	Process Knowledge	HNO ₃ – 1.8 lb/hr	none	-	-

SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/unco ntrolled, etc)
SN-34	Process Knowledge	$PM_{10} - 0.7 lb/ton x 1.16 ton/hr$	none	-	-
SN-35	Process Knowledge	$PM_{10} - 2.0 \ lb/hr$	baghouse	99%	-
SN-38	$EF_{PM} = Total liquid drift (lb/1000 gal)$ x TDS Fraction (ppm) = 1.7 lb/1000 gal x 1,560 ppm PM10 = EF_{PM} x flowrate = 9,000 gpm x EF_{PM}				0.17 lb/1000 gal is design drift loss percent provided by AP-42. Table 13.4-1
SN-39	$EF_{PM} = Total liquid drift (lb/1000 gal)$ x TDS Fraction (ppm) = 1.7 lb/1000 gal x 1,560 ppm PM10 = EF_{PM} x flowrate = 14,000 gpm x EF_{PM}				1.7 lb/1000 gal is design drift loss percent provided by AP-42. Table 13.4-1
SN-40	Engineering estimate	$NH_3 - 1.6$ lb/hr during laoding			1.6 lb/hr per truck x 2 trucks per day
SN-41	Stack testing	NH ₃ – 10.0 lb/hr PM/PM10 – 3.3 lb/hr	Chemical steam scrubber	-	-
SN-42	$EF_{PM} = Total liquid drift (lb/1000 gal)$ $x TDS Fraction (ppm)$ $= 0.17 lb/1000 gal x 1,560 ppm$ $PM10 = EF_{PM} x flowrate$ $= 16,000 gpm x EF_{PM}$		-	-	0.17 lb/1000 gal is design drift loss percent provided by manufacturer.
SN-43	$EF_{PM} = Total liquid drift (lb/1000 gal)$ x TDS Fraction (ppm) = 1.7 lb/1000 gal x 1,560 ppm PM10 = EF_{PM} x flowrate = 2,000 gpm x EF_{PM}				1.7 lb/1000 gal is design drift loss percent provided by AP-42. Table 13.4-1
SN-44	Mass Balance sulfuric acid.	e for sulfur oxides and m similar plant plus a	Scrubber	-	-

SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/unco ntrolled, etc)
	safety factor	of 25%.			
SN-46	3000 gpm x 0.000064 x 1,560 ppm = 0.2 lb/hr PM ₁₀		-	-	0.0064% is design drift loss percent provided by manufacturer.

13. TESTING REQUIREMENTS:

This permit requires stack testing of the following sources.

SN(s)	Pollutant	Test Method	Test Interval	Justification For Test Requirement
SN-10	NOx	7E	Every five years	Necessary for efficiency check on Venturi & Packed Tower Scrubber
SN-10	HNO3	approved method	Every five years	Necessary for efficiency check on Venturi & Packed Tower Scrubber
SN-07	SO ₂	6C	Initial performance test	NSPS Requirement
SN-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.
SN-17	NH3	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.
SN-15, SN-14, and SN-21	PM ₁₀	Modified 5	Every five years	Necessary to prove that PSD has not been triggered.

Permit #: 0573-AOP-R8 AFIN #: 70-00040 Page 10 of 13

SN(s)	Pollutant	Test Method	Test Interval	Justification For Test Requirement
SN-15	NH3	approved method	Yearly	Necessary to prove adherence to the non-criteria pollutant strategy.
SN-21	NH ₃	approved method	Every five years	Necessary to prove adherence to the non-criteria pollutant strategy.
SN-44	$SO_2 NO_x H_2SO_4 HNO_3$	approved method	Every five years	Necessary to prove adherence to the non-criteria pollutant strategy.
SN-08 and SN-09	NH ₃	CTM-027	Every five years	Verify emissions

14. MONITORING OR CEMS

The following are parameters that must be monitored with CEMs or other monitoring equipment (temperature, pressure differential, etc), frequency of recording and whether records are needed to be included in any annual, semiannual or other reports.

SN	Parameter or Pollutant to be Monitored	Method of Monitoring (CEM, Pressure Gauge, etc)	Frequency*	Report (Y/N)**
SN-13, SN- 22	NOx emission rate	CEM	Continuously	Y
SN-07	SO ₂ emission rate	СЕМ	Continuously	Y
SN-08, SN-09	NOx emission rate	СЕМ	Continuously	Y
SN-41	Ammonia and particulate emission rates	Daily two 12-hour composite sample	Continuously	Y

* Indicate frequency of recording required for the parameter (Continuously, hourly, daily, etc.)

** Indicates whether the parameter needs to be included in reports.

Permit #: 0573-AOP-R8 AFIN #: 70-00040 Page 11 of 13

15. RECORD KEEPING REQUIREMENTS

The following are items (such as throughput, fuel usage, VOC content of coating, etc) that must be tracked and recorded, frequency of recording and whether records are needed to be included in any annual, semiannual or other reports.

SN	Limit (as established i Recorded ItemRecorded Itempermit)		Frequency*	Report (Y/N)**
SN-08				
SN-09	weak nitric acid production	304,775 tons/12 months	monthly	Y
SN-13	weak nitric acid production	140,000 tons/12 months	monthly	Y
SN-22			· · · · · · · · · · · · · · · · · · ·	
SN-10	concentrated nitric acid	SN-22 - 118,260 tons/12	monthly	Y
Facility	production	months;		
SN-10	Scrubber parameter hydrogen peroxic concentration		daily	N
SN-29	nitric acid shipped	200,000 tons/12 months	monthly	Y
SN-07	Sulfuric acid production	200,750 ton/12 months		
SN-30	sulfuric acid shipped	200,750 tons/12 months	monthly	Y
All E2 Plant	Production	473,040 tons/12 months	Monthly	Y
SN-05	Scrubber liquid flow rate for each scrubber Gas pressure drop across unit	225 gal/min (minimum) 2.5 in. H_2O (minimum)	daily	N
514-05	Scrubber liquid pH	0.5 - 4.5	uarry	
	Scrubber liquid flow rate (dual scrubber) pH	120 gal/min (minimum)		
SN-17	Amperage	0.5 - 6.0	daily	N
	1 0	100 amp (minimum)	-	
All KT				
plant	production	252,000 tons/12 months	monthly	Y
SN-25	usage of gasoline	40,000 gallons/12 months	monthly	Y
SN-37	minimum gas pressure	10 in. H ₂ O (minimum)	When scrubber in operation	N

SN	Recorded Item	Limit (as established in permit)	Frequency*	Report (Y/N)**
SN-38	Total Dissolve solid	1,560 ppm	weekly	N
SN-39	Total Dissolve solid	900 ppm	weekly	N
SN-40	Loading tonnage	no more than 468,660 tons	monthly	N
SN-42	Total Dissolve solid	1,560 ppm	weekly	N
SN-43	Total Dissolve solid	1,560 ppm	weekly	N
SN-46	Total Dissolve solid	1,560 ppm	weekly	N
	Amount of Oleum offload into			
	the storage tank	394,000 tons		
	Percent strength of the Oleum			
	Amount of mixed acid	65%		
SN-44	produced.	219,000 tons	monthly	N

* Indicate frequency of recording required for the item (Continuously, hourly, daily, etc.) ** Indicates whether the item needs to be included in reports

16. OPACITY

SN	Opacity %	Justification (NSPS limit, Dept. Guidance, etc)	Compliance Mechanism (daily observation, weekly, control equipment operation, etc)
SN-08 SN-09	10%	Compliance assurance for SCR operation	daily observation
SN-13	10%	NSPS limit	daily observation
SN-10	20%	Previous permit	daily observation
SN-01A SN-01B	10%	Previous permit	daily observation
SN-07	10%	Previous permit	daily observation
SN-12 SN-18	5%	Department Guidance	daily observation
SN-21	10%	Previous permit	daily observation
SN-14	15%	Previous permit	daily observation
SN-05 SN-11 SN-15	20%	Previous permit	daily observation
SN-06 SN-27	25%	Previous permit	daily observation

Permit #: 0573-AOP-R8 AFIN #: 70-00040 Page 13 of 13

SN	Opacity %	Justification (NSPS limit, Dept. Guidance, etc)	Compliance Mechanism (daily observation, weekly, control equipment operation, etc)	
SN-28	, <u> </u>			
SN-41	15%	Department Guidance	daily observation	

17. DELETED CONDITIONS:

The following Specific Conditions were included in the previous permit, but deleted for the current permitting action.

Former SC	Justification for removal
None	N/A

18. GROUP A INSIGNIFICANT ACTIVITIES.

No insignificant activities are included in this modification.

19. VOIDED, SUPERSEDED OR SUBSUMED PERMITS

List all active permits for this facility which are voided/superseded/subsumed by issuance of this permit.

Permit #	
0573-AOP-R8	

20. CONCURRENCE BY:

The following supervisor concurs with the permitting decision:

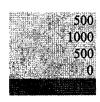
Karen Cerney, P.E.

Fee Calculation for Major Source

Facility Name: El Dorado Chemical Company Permit Number: 573-AOP-R9 AFIN: 70-00040

\$/ton factor Permit Type 20.96 Minor Mod Annual Chargeable Emission (tpy) Permit Fee \$ <u>3679.75</u> 500

Minor Modification Fee \$ Minimum Modification Fee \$ Renewal with Minor Modification \$ If Hold Active Permit, Amt of Last Annual Air Permit Invoice \$ Total Permit Fee Chargeable Emissions (tpy)



Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
РМ	ব	333.3	334	0.7	7	1.1
PM ₁₀	, ⊂	- 333.3	.334	0.7		
SO ₂	<u>고</u>	411.3	408.3	-3		
VOC	ন্থ	4.5	4.5	0		n in in 19 19 Anno Anno 19
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NH ₃		434	434.8	0.8	· · ·	
HNO ₃		67.6	67.6	0	· · · ·	
Hexane			1.2	0		
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