

STATEMENT OF BASIS

for the issuance of Air Permit # 0573-AOP-R6

1. PERMITTING AUTHORITY:

Arkansas Department of Environmental Quality
8001 National Drive
Post Office Box 8913
Little Rock, Arkansas 72219-8913

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: June 24, 2005, October 17, 2005, November 14, 2005, December 27, 2005, January 5, 2006, January 17, 2006, January 26, 2006, February 1, 2006, and February 10, 2006.

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 permitting action includes:

- a. a minor modification to install a new Mixed Acid Plant Scrubber (SN-44),
- b. revision of the language of stack testing for SN-05, removal of stack testing requirements for SN-06, clarification of permit requirements, and revision of control equipment monitoring parameters in the permit issued on April 12, 2005 and the agreed upon changes in the Permit Appeal Resolution (PAR),
- c. incorporate hard-wired emission factors for the E2 and KT plants, and
- d. PSD application to increase the ammonium nitrate production limit of the E2 Plant to maximum equipment potential.

Air Permit 0573-AOP-R3 issued on February 20, 2003 authorized the installation the third neutralizer. The additional of the third neutralizer debottlenecked the ammonium nitrate

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production of the E2 plant, and EDCC took a production limit of 228,071 ton of ammonium nitrate produce at E2 plant to avoid PSD review. In this application, EDCC calculated the PM₁₀ emissions increase using actual-to-potential, and the calculations show the PM₁₀ increase to be 46.3 tpy.

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 August 30, 2005. The facility was in compliance at the time of this inspection.

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) N Permit # ___N_____

Is this facility categorized as a major source for PSD? (Y/N) Y

≥ 100 tpy and on the list of 28 (100 tpy)? (Y/N) Y

≥ 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 Pollutant Specific Regulatory Applicability

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

9. EMISSION CHANGES:

The following table summarizes plantwide emission changes associated with this permitting action.

Plantwide Permitted Emissions (ton/yr)

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Pollutant	Air Permit 0573-AOP-R5	Air Permit 0573-AOP-R6	Change
PM/PM ₁₀	318.7	318.8	+0.1
SO ₂	2520.4	2526.8	+6.4
VOC	4.5	4.5	0
CO	52.3	52.3	0
NO _x	2408.5	2410.2	+1.7
H ₂ SO ₄	33.2	39.6	+6.4
NH ₃	309.6	309.6	0
HNO ₃	74.4	75.3	+0.9
Hexane	1.2	1.2	0

10. MODELING:

A. Criteria Pollutants

Pollutant	Emission Rate (lb/hr)	NAAQS Standard (µg/m ³)	Averaging Time	Highest Concentration (µg/m ³)	% of NAAQS
PM ₁₀	193.6	50	Annual	27.2*	54%
		150	24-hour	132.5*	88%
SO ₂	601.7	80	Annual	13.8	17%
		1,300	3-hour	494.7	38%
		365	24-hour	140.7	38%
NO _x	592.0	100	Annual	13.97	19%
VOC	18.5	0.12	1-hour (ppm)	NA	0%
CO	12.0	10,000	8-hour	NA	0%
		40,000	1-hour	NA	0%

* - Background (24 µg/m³) is added 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/m³), 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	20.0	No
H ₂ SO ₄	0.2	0.022	9.1	No
NH ₃	17.41	1.915	85.6	No
Hexane	1762	193	0.6	Yes

2nd Tier Screening (PAIL)

SCREEN3 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	51.5	28.6	Yes
H ₂ SO ₄	2	1.96	Yes
NH ₃	174.1	163.3	Yes

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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/uncontrolled, etc)
SN-05	Testing	PM ₁₀ – 13.0 lb/hr, 0.96 lb of PM ₁₀ per ton of ammonium nitrate produced.	Brinks Scrubber	-	97% particulate control efficiency.
SN-05	Engineering Estimate	NH ₃ – 100 lb/hr x 0.1 x (100%-65%)	Brinks Scrubber	-	65 % control efficiency for ammonia emissions.
SN-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.
SN-07	Testing	SO ₂ – 600 lb/hr	Brinks Mist Eliminator	-	-
SN-07	Testing	H ₂ SO ₄ – 7.5 lb/hr	Brinks Mist Eliminator	-	360 ton/day x 0.5 lb/ton
SN-08	Testing	NO _x - 200.1 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	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	Stack Test Data	HNO ₃ – 0.389 lb/hr NO _x 3.3 lb/hr	-	-	Permitted lb/hr is stack test data plus 25% safety factor.
SN-13	NSPS	3.0 lb/ton of acid	refrigerated	-	-

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/uncontrolled, etc)
			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 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	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	-	-
SN-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	-	-
SN-17	Testing	PM ₁₀ - 21.6 lb/hr	Pease-Anthony Scrubber	-	
SN-17	Testing	NH ₃ - 5.0 lb/hr	Pease-Anthony Scrubber	-	-
SN-18	Process	PM ₁₀ - 0.033 lb/ton	Baghouse	-	-

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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/uncontrolled, etc)
	Knowledge				
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	-	-	-
SN-21	Testing	PM ₁₀ – 0.1 lb/ton	Brinks Scrubber	-	-
SN-21	Testing	NH ₃ – 1.0 lb/ton	Brinks Scrubber	-	-
SN-22	CEM	NO _x - 3.0 lb/ton	cryogenic absorption	-	-
SN-22	Process Knowledge	HNO ₃ – 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	H ₂ SO ₄ – 0.0334 lb/1000 gallons	none	-	-
SN-31	SOCMI	NH ₃ – 0.5 lb/hr	none	-	-
SN-32	SOCMI	NH ₃ – 1.3 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/uncontrolled, etc)
SN-33	Process Knowledge	NO _x – 1.9 lb/hr	none	-	-
SN-33	Process Knowledge	HNO ₃ – 1.8 lb/hr	none	-	-
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-37	Process knowledge	3 gal HNO ₃ /car x 2 car/day, 37.65 lb HNO ₃ /car x efficiency x 1 vent period/106 minutes.	Scrubber	80%	-
SN-38	EF _{PM} = Total liquid drift (lb/1000 gal) x TDS Fraction (ppm) = 1.7 lb/1000 gal x 1,560 ppm PM ₁₀ = 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 PM ₁₀ = 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/PM ₁₀ – 3.3 lb/hr	Chemical steam scrubber	-	The facility will conduct a continuous engineering study to verify

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/uncontrolled, etc)
					emission rate.
SN-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.
SN-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
SN-44	Mass Balance for sulfur oxides and sulfuric acid. Stack test from similar plant plus a safety factor of 25%.		Scrubber	-	-

13. TESTING REQUIREMENTS:

This permit requires stack testing of the following sources.

SN(s)	Pollutant	Test Method	Test Interval	Justification For Test Requirement
SN08 & SN-09	NOx	7E	Yearly or every three years if pass three consecutive years of annual testing	Necessary for efficiency check on SCR's
SN08 & SN-09	NOx	approved method	Monthly	Necessary for efficiency check on SCR's
SN-10	NOx	7E	Every five years	Necessary for efficiency check on Venturi & Packed Tower Scrubber
SN-10	HNO ₃	approved	Every five years	Necessary for efficiency

SN(s)	Pollutant	Test Method	Test Interval	Justification For Test Requirement
		method		check on Venturi & Packed Tower Scrubber
SN-07	SO ₂	6C	Every five years	Necessary for efficiency check on operation of the sulfuric acid plant
SN-07	H ₂ SO ₄	8	Every five years	Necessary for efficiency check on operation of the sulfuric acid plant
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	PM ₁₀ NH ₃	Method 5 with back-half 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-41	PM ₁₀ NH ₃	Approved Method	Particulate testing starts after the completion of the engineering study. See Specific Condition 69 Every three years	To verify emission rates Necessary to prove adherence to the non-criteria pollutant strategy.
SN-15, SN-14, and SN-21	PM ₁₀	Modified 5	Every five years	Necessary to prove that PSD has not been triggered.
SN-15	NH ₃	approved method	Yearly	Necessary to prove adherence to the non-criteria pollutant strategy.
SN-21, SN-17	NH ₃	approved method	Every five years	Necessary to prove adherence to the non-criteria pollutant strategy.
SN-44	SO ₂	approved	Every five years	Necessary to prove adherence

SN(s)	Pollutant	Test Method	Test Interval	Justification For Test Requirement
	NO _x H ₂ SO ₄ HNO ₃	method		to the non-criteria pollutant strategy.

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	NO _x emission rate	CEM	Continuously	Y
SN-07***	SO ₂ emission rate	CEM	Continuously	Y
SN-08, SN- 09	Inlet and outlet temperatures	Temperature probes and an electronic data logger	Continuously	Y

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

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

*** Applicable if the plant is operated at a rate greater than 300 tpd

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	Recorded Item	Limit (as established in permit)	Frequency*	Report (Y/N)**
SN-08 SN-09	weak nitric acid production	292,320 tons/12 months	monthly	Y
SN-08 SN-09	Inlet and outlet temperatures	See Specific Condition #3	continuously	Y
SN-13	weak nitric acid production	140,000 tons/12 months	monthly	Y

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SN	Recorded Item	Limit (as established in permit)	Frequency*	Report (Y/N)**
SN-22 SN-10 Facility	concentrated nitric acid production	SN-22 - 118,260 tons/12 months; SN-10 - 62,900 tons/12months; facility - 126,056 tons/12 months	monthly	Y
SN-10	Scrubber parameter	hydrogen peroxide concentration	daily	N
SN-22	start-up and shutdown emissions of NO _x lb/hr and opacity over limits	see S.C. 30 & 31	daily	Y
SN-29	nitric acid shipped	200,000 tons/12 months	monthly	Y
SN-07	daily production	300 TPD w/o CEM 360 TPD w/ CEM	daily	Y
SN-30	sulfuric acid shipped	126,000 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 Scrubber liquid pH	225 gal/min (minimum) 2.5 in. H ₂ O (minimum) 0.5 – 4.5	daily	N
SN-17	Scrubber liquid flow rate (dual scrubber) pH Amperage	120 gal/min (minimum) 0.5 – 6.0 100 amp (minimum)	daily	N
SN-41	Flow rate to top tray of scrubber Conductivity of stack gas Scrubber liquid pH	120 gal/min per scrubber (minimum) 77 (max) μMhos 3.0 – 10.0	daily	N
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-44	Amount of Oleum offload into the storage tank	394,000 tons	monthly	N
	Percent strength of the Oleum	65%		
	Amount of mixed acid produced.	219,000 tons		

• 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-22	10%*	Previous permit	daily observation
SN-07	15%	Previous permit	daily observation
SN-12 SN-18	5%	Department Guidance	daily observation
SN-21	10%	Previous permit	daily observation
SN-14 SN-17	15%	Previous permit	daily observation
SN-05 SN-11 SN-15	20%	Previous permit	daily observation

SN	Opacity %	Justification (NSPS limit, Dept. Guidance, etc)	Compliance Mechanism (daily observation, weekly, control equipment operation, etc)
SN-06 SN-27 SN-28	25%	Previous permit	daily observation
SN-41	15%	Department Guidance	daily observation

* - except for startup and shutdown situations covered by S.C. 30 & 31

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

18. VOIDED, SUPERSEDED OR SUBSUMED PERMITS

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

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19. CONCURRENCE BY:

The following supervisor concurs with the permitting decision:

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David Triplett, P.E.