

STATEMENT OF BASIS

For the issuance of Draft Air Permit # 0573-AOP-R19 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:**

Shawn Hutchings

4. **NAICS DESCRIPTION AND CODE:**

NAICS Description: Nitrogenous Fertilizer Manufacturing
NAICS Code: 325311

5. **SUBMITTALS:**

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
11/18/2016	PSD MOD	Increase in Annual Emission rates for boiler
8/19/2016	None	Only changes to instack and ambient monitoring requirements.

PSD Issues in permit 0573-AOP-R19

This modification is an adjustment of the annual usage of the start-up boiler, SN-61. All hourly limits of the source are unchanged. Those hourly rates were used to do previous modeling and other impact analysis. Those analyses remain unchanged as a result of this modification and were not reviewed further.

BACT

This modification only increased the annual throughput of the boiler, SN-61. All previously established BACT limits were set on a short term basis and need not be altered with this modification except for the CO₂e annual limit. All other BACT limits established as part of this PSD project were not changed.

BACT Analysis Summary				
Source	Description	Pollutant	Control Technology	BACT Limit
SN-61	Start-up Boiler (240 MMBtu/hr)	GHG	Good operating practices	CO ₂ e 123,500 tons per rolling 12 months

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 permit is a PSD modification to remove operating limits for SN-61, the start-up boiler. This project was part of the previous PSD modifications for the facility and only addresses issues which need changing for the source. The only PSD permit limit needing changed is the CO₂e BACT limit for the source. This permit also removes the ambient NO₂ monitoring requirement for the facility. The facility submitted refined modeling which demonstrated predicted impacts lower than those relied on for the initial PSD application. The N₂O requirements for SN-59 were revised to use a specific N₂O monitor and not the NO₂ monitor to monitor both pollutant. Also, the opacity requirements in Specific Condition 206 were adjusted.

7. COMPLIANCE STATUS:

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

The facility has a CAO in routing for failed stack tests.

8. PSD APPLICABILITY:

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

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 is not PSD. This modification was an Administrative Amendment for addition of an insignificant activity.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
SN-41	PM ₁₀	PSD
SN-49, SN-53, SN-54, SN-56, SN-57, & SN-61	SO ₂ VOC CO NO _x GHG Opacity	PSD
SN-50	VOC CO GHG	PSD
SN-51	VOC CO GHG	PSD
SN-59	NO _x GHG Opacity	PSD
SN-61	NO _x	40 CFR Part 60, Subpart Db
SN-13	NO _x	40 CFR Part 60, Subpart G
SN-59	NO _x	40 CFR Part 60, Subpart Ga
SN-07	SO ₂ and sulfuric acid mist	40 CFR Part 60, Subpart H
SN-65 and 66	There are no specific emission limits or pollutants identified, but the rules generally regulate HAPs	40 CFR Part 63, Subpart ZZZZ
SN-48, SN49, SN-54, & SN-61		40 CFR Part 63, Subpart DDDDD
SN-25		40 CFR Part 63, Subpart CCCCC
SN-65	CO, PM, NMHC + NO _x	40 CFR Part 60, Subpart IIII
SN-66	CO, VOC, NO _x	40 CFR Part 60, Subpart JJJJ

10. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

11. AMBIENT AIR EVALUATIONS:

- a) The facility updated 1 – hour NO₂ modeling from previous PSD projects to justify their request to remove the NO₂ ambient monitor. Results of their modeling are summarized below.

Pollutant	Emission Rate (lb/hr)	NAAQS Standard (µg/m ³)	Averaging Time	Highest Concentration (µg/m ³)	% of NAAQS
NO _x	998.6	188	1-hour	181.9	96

The receptor which recorded the predicted concentration and also recorded all instances where the model was predict to exceed 90% of the NAAQS were the same. This receptor was located near an emergency generator located at another facility. When ADEQ ran the model to verify EDCCs results and excluded this receptor there were no instances above 90%.

b) Non-Criteria Pollutants:

The non-criteria pollutants listed below were evaluated. Based on Department procedures for review of non-criteria pollutants, emissions of all other non-criteria pollutants are below thresholds of concern.

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). Only HNO₃ and H₂SO₄ increased over previous screened emission rates.

Pollutant	TLV (mg/m ³)	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
HNO ₃	5.15	0.56	4.1	No
H ₂ SO ₄	0.2	0.022	2.97	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 ($\mu\text{g}/\text{m}^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu\text{g}/\text{m}^3$)	Pass?
HNO ₃	51.5	36	Yes
H ₂ SO ₄	2.0	0.61	Yes

12. CALCULATIONS:

SN	Emission Factor Source	Emission Factor	Control Equipment	Control Equipment Efficiency	Comments
05A and B	Vendor Specification	PM ₁₀ – 0.085 mg/acf	Brinks Scrubber	-	-
	Engineering Estimate	0.8 lb/hr NH ₃	Brinks Scrubber	99.5%	-
07	NSPS limit	SO ₂ – 92.0 lb/hr	Brinks Mist Eliminator	-	Remain the previous permitted limit
	Testing	H ₂ SO ₄ – 0.123 lb/ton	Brinks Mist Eliminator	-	-
08	Testing	NO _x - 52.2 lb/hr Ammonia – 40.0 lb/hr	Refrigeration SCR	-98.5%	
09	Testing	NO _x - 52.2 lb/hr Ammonia – 40.0 lb/hr	Refrigeration SCR	-98.5%	-
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	-	-
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	-	-	-	
25	TANKS 4.0.9	VOC	none	-	-
26	TANKS 4.0.9	NH ₃	none	-	-
27	Testing	PM 4.8E-7 lb/ton	none	-	-
28	Testing	PM 4.8E-7 lb/ton	none	-	-
30	AP-42 Section 5.2	H ₂ SO ₄ – 0.0034 lb/1000 gallons	none	-	-
31	SOCMI	NH ₃ – 0.5 lb/hr	none	-	-
32	SOCMI	NH ₃ – 1.6 lb/hr	none	-	-
33	Process Knowledge	NO _x – 0.1 lb/hr	none	-	-
	Process Knowledge	HNO ₃ – 0.1 lb/hr	none	-	-
34	Process Knowledge	PM ₁₀ – 0.7 lb/ton x 1.46 ton/hr	none	-	-
35A	Testing	PM ₁₀ – 0.1 lb/hr	baghouse	99%	-
35B	AP-42	PM 19.7 lb/hr	none		
38	EF _{PM} = Total liquid drift			-	

	$\begin{aligned} & (\text{lb}/1000 \text{ gal}) \times \\ & \text{TDS Fraction} \\ & (\text{ppm}) \\ & = 0.0834 \text{ lb}/1000 \\ & \text{gal} \times 1,560 \text{ ppm} \\ \text{PM}_{10} & = \text{EF}_{\text{PM}} \times \\ & \text{flowrate} \\ & = 9,000 \text{ gpm} \times \\ & \text{EF}_{\text{PM}} \end{aligned}$				
40	TANKS Program	NH ₃ – 0.22lb/hr			-
41	Stack testing	NH ₃ – 10.0 lb/hr PM/PM10 – 4 lb/hr	Chemical steam scrubber	-	24-hr BACT limit is 13.8 lb/hr 30-day rolling BACT limit is 3.4 lb/hr
44	Mass Balance for sulfur oxides and sulfuric acid. Stack test from similar plant plus a safety factor of 25%.	Scrubber	-	-	
46	0.00013 lb/1000 gal	-	-	0.001% is design drift loss percent provided by manufacturer.	
13	NSPS EPA/DOJ Vendor Info	NO ₂ (3-hr): 3.0 lb/ton NO ₂ (3-hr): 1.0 lb/ton (excluding SSM) NO ₂ (rolling 365-days): 0.6 lb/ton NH ₃ : 20 ppm	SCR	95%	After installation of SCR and Tail gas preheater
65 and 66	AP-42 or NSPS	varied	none	--	
67	AP-42	0.02 lb/ton	None		

14 and 21	Vendor Specification	0.085 mg/acf PM	Scrubber	99.5 for ammonia	
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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
05A and B	PM ₁₀	Approved method	Initial and alternating annually.	Necessary to prove that PSD has not been triggered.
14, & 21	PM, PM ₁₀ , PM _{2.5}	Method 5 or 201A, and 202	Annually until 2 consecutive passes, then once every 5 years	Necessary to prove that PSD has not been triggered.
21	NH ₃	Approved method	Annually until 3 consecutive passes, then once every 3 years	Necessary to prove adherence to the non-criteria pollutant strategy.
44	SO ₃ 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 or equivalent	Every five years	Verify emissions

SN	Pollutants	Test Method	Test Interval	Justification
59	NH ₃	CTM-027 or equivalent	Annually until 2 consecutive passes, then once every 5 years	Necessary to prove adherence to the non-criteria pollutant strategy.
49	PM PM ₁₀ PM _{2.5} SO ₂ VOC CH ₄ CO CO ₂ N ₂ O	Method 5 & 202 Method 201A & Method 202 Method 6C Method 25A Method 18 Method 10 Method 3A Method 320, ASTM D6348-03 or other approved method	Annually until 2 consecutive passes, then once every 5 years	Verify emissions
50	VOC CO ₂	25A 3A	One Time Test	Verify emissions
50	Methanol	18 or 25A	Annually until 2 consecutive passes, then once every 5 years	Verify emissions
51	VOC Pre and Post Control CO NH ₃	25A 10 320	One Time Test	Verify emissions
51	Methanol CO ₂	18 or 25A 3A	Annually until 2 consecutive passes, then once every 5 years	Verify emissions

SN	Pollutants	Test Method	Test Interval	Justification
61	PM PM ₁₀ PM _{2.5} SO ₂ VOC CO NO _x	Method 5 & 202 Method 201A & Method 202 6C 25A 10 7E	Annually until 2 consecutive passes, then once every 5 years	Verify emissions
13	NH ₃	CTM-027 or equivalent	Annually until 2 consecutive passes, then once every 5 years	Necessary to prove adherence to the non-criteria pollutant strategy.

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)
13	NO _x	CEM	Continuously	Y
07	SO ₂ emission rate	CEM	Continuously	Y
08 & 09	NO _x	CEM	Continuously	Y
41 and 63	Ammonia and particulate emission rates	Daily sampling consisting of two 12-hour composite sample	Continuously	Y
59	NO _x and N ₂ O	CEM	Continuously	Y
49	NO _x	CEM	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

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
13	weak nitric acid production	140,000 tons/12 months	Monthly	Y
38, 46, 52, 60	Total Dissolve solid	1,560 ppm	Weekly	N
59	weak nitric acid production	461,725 tons/12 months	Monthly	Y
47	strong nitric acid production	5.2 tons per hour	Hourly	Y
47	strong nitric acid production	45,625 tons/12 months	Monthly	Y
10	Scrubber parameter	hydrogen peroxide concentration	Daily	N
07	Sulfuric acid production	200,750 ton/12 months	Monthly	Y
	Sulfuric acid production	550 tons of 100% sulfuric acid per day	Daily	Y
	Sulfuric acid emission limit	4.0 lb of SO ₂ per ton of acid production, expressed as 100% H ₂ SO ₄ , and based on a 3-hr average.	Continuously and averaged every 3-hours	N
	Annual SO ₂ Emissions (tpy on a calendar basis)	N/A	Annually	N
30	Sulfuric acid shipped	200,750 tons/12 months	Monthly	Y
All E2 Plant	Production	525,600 tons/12 months	Monthly	Y
05A and B	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 – 6.0	Daily	N

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
41	BACT Limit PM	24-hour Average 0.223 lb/ton	Daily	Y
		30-day Average 0.054 lb/ton	Monthly	Y
All KT plant	Production	394,200 tons/12 months	Monthly	Y
14	Scrubber liquid flow rate	225 gal/min (minimum)	Daily	N
	Gas Pressure Drop Across Unit	2.5 in H ₂ O (minimum)		
	pH	0.5 – 6.0		
	Exhaust Flow Rate	131,452 acfm (maximum)		
18	Baghouse Pressure Drop	0.5 – 8.0 in H ₂ O	Daily	N
21	Scrubber liquid flow rate	225 gal/min (minimum)	Daily	N
	Gas Pressure Drop Across Unit	2.5 in H ₂ O (minimum)		
	pH	0.5 – 6.0		
	Exhaust Flow Rate	131,452 acfm (maximum)		
63	PM emissions	24-hour Average 0.223 lb/ton	Daily	Y
		30-day Average 0.054 lb/ton	Monthly	Y
	AN Production	547,500 tons/12 months	Monthly	Y
49	NH ₃ production	565,750 tons/12 months	Monthly	Y
	Natural gas usage	7,076.7 MMscf per 12 months	Monthly	Y
53	Natural gas usage	9.0 MMscf per 12 months	Monthly	Y
	Hours of operation	No more than 3 hours during any 24-hour period	Daily	Y

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
		unless HRU outage		
51	Scrubber parameters	30 gpm 2 in H ₂ O	Daily	N
56	Natural gas usage	8.2 MMscf per 12 months	Monthly	Y
57	Natural gas usage	1.5 MMscf per 12 months	Monthly	Y
54	Natural gas usage	18.63 MMscf per 12 months	Monthly	Y
54, 56, 57	Flare maintenance	No limit	As required	Y
44	Amount of Oleum offload into the storage tank Percent strength of the Oleum Amount of mixed acid produced.	394,000 tons 30% 219,000 tons	Monthly	N
44	Scrubber liquid flow rate for each scrubber Gas pressure drop across unit Scrubber liquid pH	5.0 gal/min (minimum) 10 – 35 in. H ₂ O 0.5 – 7.5	Daily	N
25	usage of gasoline	40,000 gallons/12 months	Monthly	Y
29	Nitric Acid Shipped	250,000 tons/12 months	Monthly	Y
40	AN Loading tonnage	65,000,000 tons/12 months	Monthly	Y
58	Ammonia Loading	226,300 tons/12 months	Monthly	Y
65 and 66	Hours of operation	100 hours per calendar year	Monthly	Y
65 and 66	Engine maintenance	Change oil and filter every 500 hours of operation, or	As needed	N

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
		annually, whichever comes first; Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first; and Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.		
67	Prills Unloaded	36,500 tons per 12 months	Monthly	Y

16. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
08 & 09	10%	Compliance assurance for SCR operation	Daily Observation
07 & 13	10%	NSPS limit	Daily Observation
54, 61	5%	Department Guidance	Natural Gas Combustion
49, 59	0%	BACT limit	Daily Observation
53, 56, 57	0%	BACT limit	Natural Gas Combustion
05A and B, 18, 35A, 47, 63	5%	Department Guidance	Weekly Observation
52, 60	5%	Department Guidance	Weekly TDS
21, 27, 28	10%	Department Guidance	Daily Observation
14, 19	15%	Department Guidance	Daily Observation
34, 44	20%	Previous permit	Daily Observation

Natural Gas Pipeline Knockout Pot	A-13			0.14						
Portable Cooling Tower	A-13	0.043								
E2 Prill Warehouse	A-13	1.03								
Total	A-13	5.49	0.01	2.26	0.01	0.01	0.13	0.54	0.01	0.01
Sulfuric Acid Solution Storage Tanks	B-21									

19. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

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

Permit #
0573-AOP-R18

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

Fee Calculation for Major Source

Revised 03-11-16

El Dorado Chemical Company
 Permit #: 0573-AOP-R19
 AFIN: 70-00040

\$/ton factor	23.93	Annual Chargeable Emissions (tpy)	1925.34
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	<input type="checkbox"/>
If Hold Active Permit, Amt of Last Annual Air Permit Invoice \$	0
Total Permit Fee Chargeable Emissions (tpy)	24.2
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		114.7	122.1	7.4	7.4	122.1
PM ₁₀		94.3	101.7	7.4		
PM _{2.5}		89.8	95.7	5.9		
SO ₂		402.9	403.4	0.5	0.5	403.4
VOC		37.3	40.3	3	3	40.3
CO		130.1	157.3	27.2		
NO _x		708	721.3	13.3	13.3	721.3
CO _{2e}	<input type="checkbox"/>	1207090	1293490	86400		

