STATEMENT OF BASIS

For the issuance of Draft Air Permit # 1590-AR-24 AFIN: 29-00125

1. PERMITTING AUTHORITY:

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

2. APPLICANT:

Hexion, Inc. - Hope Plant
185 North Industrial Drive
Hope, Arkansas 71801

3. PERMIT WRITER:

Alexander Sudibjo

4. NAICS DESCRIPTION AND CODE:

NAICS Description: Plastics Material and Resin Manufacturing
NAICS Code: 325211

5. ALL SUBMITTALS:

The following is a list of ALL permit applications included in this permit revision.

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
10/11/2023	Deminimis	Increased formaldehyde content

6. REVIEWER'S NOTES:

With this deminimis modification, the facility is increasing the maximum formaldehyde content for blends to 55% and increasing the temperature limits for certain formaldehyde formulation. This results in an increase in SN-01 and SN-10 emissions. The facility is also increasing total wax production to 65,000,000 lb/yr. This change only affects sources in the insignificant activities list. The facility's permitted annual emissions are increasing by 0.05 tpy formaldehyde.

7. COMPLIANCE STATUS:

As of October 11, 2023, there are no compliance issues with the facility. ECHO (https://echo.epa.gov/detailed-facility-report?fid=110000451190) shows no air violations identified as of July 23, 2021.

8. PSD/GHG APPLICABILITY:

a) Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, etc.)? N
If yes, were GHG emission increases significant?

b) Is the facility categorized as a major source for PSD? N
- *Single pollutant ≥ 100 tpy and on the list of 28 or single pollutant ≥ 250 tpy and not on list*

If yes for 8(b), explain why this permit modification is not PSD.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
02	Fuel records only	40 CFR Part 69 Subpart Dc
SN-08 and tanks T-73, T-74, T-75, T-76, T-77, T-83, and T-84 and phenol tanks T-71 and T-72	VOC	40 CFR Part 60 Subpart Kb
Facility	VOC	40 CFR Part 60 Subpart III
Entire Facility	Equipment leak, VOC	40 CFR Part 60 Subpart VV

10. UNCONSTRUCTED SOURCES:

Unconstructed Source	Permit Approval Date	Extension Requested Date	Extension Approval Date	If Greater than 18 Months without Approval, List Reason for Continued Inclusion in Permit
N/A				

11. PERMIT SHIELD – TITLE V PERMITS ONLY:

Did the facility request a permit shield in this application? N
(Note - permit shields are not allowed to be added, but existing ones can remain, for minor modification applications or any Rule 18 requirement.)

If yes, are applicable requirements included and specifically identified in the permit? If not, explain why.

For any requested inapplicable regulation in the permit shield, explain the reason why it is not applicable in the table below.

Source	Inapplicable Regulation	Reason
N/A		

12. COMPLIANCE ASSURANCE MONITORING (CAM) – TITLE V PERMITS ONLY:

List sources potentially subject to CAM because they use a control device to achieve compliance and have pre-control emissions of at least 100 percent of the major source level. List the pollutant of concern and a brief summary of the CAM plan (temperature monitoring, CEMs, opacity monitoring, etc.) and frequency requirements of § 64.

Source	Pollutant Controlled	Cite Exemption or CAM Plan Monitoring and Frequency
N/A		

13. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

14. AMBIENT AIR EVALUATIONS:

The following are results for ambient air evaluations or modeling.

a) NAAQS

A NAAQS evaluation is not required under the Arkansas State Implementation Plan, National Ambient Air Quality Standards, Infrastructure SIPs and NAAQS SIP per Ark. Code Ann. § 8-4-318, dated March 2017 and the DEQ Air Permit Screening Modeling Instructions.

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 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 × TLV	Proposed lb/hr	Pass?
Formaldehyde	0.37	0.041	10.70	N
Phenol	19.25	2.12	2.71	N
Methanol	262.09	28.83	11.80	Y
Triethylamine	4.14	0.455	1.52	N

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 ($\mu g/m^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu g/m^3$)	Pass?
Formaldehyde	15	40.38	N
Phenol	192.5	52.40	Y
Triethylamine	41.4	62.27	N

SN-01 contributes a negligible (3%) portion of the modeled concentration. An increase in SN-01 emissions have minimal effect on the following risk assessment.

Formaldehyde Risk Assessment

Results of the Tier I - Presumptively Acceptable Emission Rate (PAER) and Tier II - Presumptively Acceptable Impact Level (PAIL) comparison performed by the department exceeded the screening threshold levels for formaldehyde. For this reason, a Tier III screening level human health risk assessment was performed to demonstrate to the department that the projected ambient formaldehyde concentrations at nearby occupied buildings do not result in unacceptable impacts to human health. This analysis includes consideration of both chronic or long-term exposure and related health effects; as well as consideration of acute or 1-hr exposure related health effects.

Long-Term Exposure Analysis

To evaluate long-term exposures, this screening level assessment was completed by comparing modeled air concentrations with USEPA human health Risk-Based Screening Levels (RSLs). RSLs were developed by USEPA to support risk-based decisions making under Superfund and RCRA programs. RSLs are considered by EPA to be protective for

humans (including sensitive groups) over a lifetime of exposure. The screening level assessment process is intended to provide conservative estimates of potential health impacts. If chemical concentrations fall below the RSLs, no further action is warranted.

The screening level analysis was completed using the USEPA Online SL calculators. The analysis includes evaluation of both offsite worker and resident exposure scenarios. The following table summarizes the comparison of SLs with modeled annual air concentrations for the offsite worker and resident exposure scenarios.

Exposure Scenario	Carcinogenic RSL ($\mu g/m^3$)	Non-carcinogenic RSL ($\mu g/m^3$)	Modeled Concentration ($\mu g/m^3$)	Pass?
Offsite Worker	9.43	43.0	Less than 9.43 $\mu g/m^3$ at nearby commercial & industrial buildings	Y
Resident	1.87	10.2	Less than 1.87 $\mu g/m^3$ at nearby residential subdivision	Y

If the modeled concentrations are less than the recommended RSLs, adverse health effects are not expected and therefore considered protective of human health. For purposes of this screening level risk assessment a target hazard quotient of 1.0 and a target cancer risk of 1x10E-05 were used. As shown in the previous table, modeled concentrations are below the Carcinogenic and Non-carcinogenic SLs. As such, there is confidence in the conclusion that no adverse health effects are expected from exposure to formaldehyde emission attributable to the operation of the facility.

The modeled concentrations contour map shows the modeled annual concentrations of formaldehyde around the facility. A residential area lies approximately 800 meters to the southeast of the facility and the 1.87 $\mu g/m^3$ concentration contour does not encompass it. There are several nearby commercial and industrial buildings and the smaller 9.43 $\mu g/m^3$ concentration contour does not encompass them.

Short-Term Exposure Analysis

USEPA RSLs currently only address long-term exposure; therefore an acute exposure analysis was also performed to evaluate the potential for short-term health effects. Acute inhalation exposure guidelines are designed to protect a variety of exposure groups including occupational workers and the general public and are intended to protect against a variety of toxicity endpoints ranging from discomfort or mild adverse health effects to serious or potentially life threatening effects. For this study, the Acute Exposure Guideline Level 1 (AEGL-1) for formaldehyde is used. The AEGL-1 is the airborne concentration, expressed as parts per million or milligrams per cubic meter (ppm or mg/m3) of a substance above which it is predicted that the general population, including

susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

The AEGL-1 for formaldehyde is 0.90 ppm (1,107 $\mu g/m^3$) for periods of 10 minutes through 8 hours.

The acute inhalation exposure analysis was performed by comparing the modeled 8-hr maximum air concentrations with the AEGL-1 value referenced above. The highest modeled maximum 8-hr concentration is approximately 1,748 $\mu g/m^3$. The area exceeding the 1,107 $\mu g/m^3$ AEGL-1 limit for formaldehyde occurs within 70 meters of the NE plant boundary. No residential, commercial, or industrial areas are affected. As such, there is confidence in the conclusion that no adverse health effects are expected from short-term exposure to formaldehyde emission attributable to the operation of the facility.

Triethylamine Risk Assessment

AERMOD air dispersion modeling of 24-hr maximum air concentration shows the area exceeding the 41.4 $\mu g/m^3$ PAIL limit for triethylamine occurs within 70 meters from the NE plant boundary and 50 meters from the SW plant boundary. No residential, commercial, or industrial areas are affected. As such, there is confidence in the conclusion that no adverse effects are expected from triethylamine emission attributable to the operation of the facility.

c) H_2S 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 H_2S Standards Y
If exempt, explain: the facility does not have H_2S emissions.

15. CALCULATIONS:

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
01	TANKs Stack Test AP-42 5.2	varied	Fume Scrubber	53% formaldehyde 80% methanol and phenol	Fume scrubber controls emissions from resin production plant (phenol and amine storage tanks)

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
02	AP-42 1.4	lb/MMscf PM/PM_{10}: 7.6 SO_2: 0.6 VOC: 5.5 CO: 84 NOx: 100	-	-	16.76 MMBtu/hr max capacity
03A	Vendor Information	lb/hr formaldehyde: 0.32 dimethyl ether: 4.51 methanol: 0.40 methyl formate: 0.019 VOC: 5.25 CO: 7.46	Catalytic Oxidizer	98%	-
05	AP-42, 5.2	varied	N/A		Truck Loading and Tank Farm Loss
04	AP-42, 13.2.4	varied	Dust collector	N/A	Bulk solids loading of urea and non-urea
08	AP-42, 7.1.3.1.2, TANKS	Tanks emission calculations Varied	Internal Floating Roof	N/A	Fugitive emissions from PF resin & UF resin storage tank farms
09A	AP-42 7.1.3.1.2	$L_W = 0.001 * M_V * P_{va} * Q * K_N * K_P$	-	-	L_W = working loss M_V = vapor MW P_{VA} = vapor pressure Q = annual throughput K_N = turnover factor K_P = working loss factor L_{MAX} = max lb/hr FR_M = max fill rate N = turnovers per yr TC_G = tank capacity (gallons)
	TCEQ Technical Guidance for Chemical Sources	$L_{MAX} = L_W * FR_M / (N * TC_G)$			
10	TCEQ October 2000 Draft Equipment Leak Fugitives	varied	varied	varied	Fugitive emissions from various components throughout facility
11	AP-42, 3.3-1	varied	-	-	300 hours per year

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
12	AP-42, 5.1	Drift factor: 0.005%	-	-	Max Flow: 7,925 gpm Max TDS: 5,000 ppm

16. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutants	Test Method	Test Interval	Justification
Facility	VOC leaks	21	Varies per source	Subpart VV leak requirements.
03A	TOC destruction	18	Initial	NSPS III required
			5 year	To insure continued compliance

17. 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)
03A	Temperature	Thermocouple	15min	Y
08	Kb required inspections	Outlined in subpart	Varied	Y
03A	Catalyst inspection	Not specified	Annually	N

18. 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)
Facility	**Production	UF Resin = 500,000,000 lbs	Monthly	N

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
		PF Resin = 250,000,000 lbs Maximum total resin production = 500,000,000 lbs. 50% Formaldehyde Solution = 265,000,000 lbs Hydrolyzed UF Resin = 4,000,000 lbs.		
05	Formaldehyde loaded	140,000,000 lbs	Monthly	N
03A	Record of initial compliance test for Subpart III	98% control or 20 ppmv on dry basis	Kept on site at all times	N
Facility	Leak detection records	No specific limit	Varies per type of equipment	Y
Kb Tanks	Kb records of dimension and product stored	No limit	Kept on site at all times	N
08	Kb required records	No limit	Kept on site at all times	N
02	Dc fuel usage records	None	Monthly	N
11	Hours of Operation	300 hours per calendar year	Monthly	N
	Maintenance Records	N/A	Kept on site at all times	N
12	TDS Content	5,000 ppm	Quarterly	N
03A	Additional Methanol to the Inlet of Incinerator	80 lb/hr	Monthly	N

19. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
02	5%	Rule 18.501	Inspector observation

SN	Opacity	Justification for limit	Compliance Mechanism
04	20%	Rule 18.501	Inspector observation
11	5%	Rule 18.501	Inspector observation

20. DELETED CONDITIONS:

Former SC	Justification for removal
N/A	

21. GROUP A INSIGNIFICANT ACTIVITIES:

The following is a list of Insignificant Activities including revisions by this permit.

Source Name	Group A Category	Emissions (tpy)						
		PM/ PM_{10}	SO_2	VOC	CO	NO_x	HAPs	
							Single	Total
UF Washwater Storage Tank T-10	A-13			1.70E-2				1.70E-2
PF Washwater Storage Tank T-11	A-13			8.00E-3				8.00E-3
PF Washwater Storage Tank T-12	A-13			8.00E-3				8.00E-3
UF Washwater Storage Tank T-13	A-13			4.02E-2				4.02E-2
Chilled Water Tank T-41	A-13			0.0				0.0
Wax Emulsion Storage Tank T-64	A-13			1.68E-4				6.57E-5
Wax Emulsion Storage Tank T-65	A-13			1.68E-4				6.57E-5
Slack Wax/Tallow Storage Tank T-66	A-13			9.21E-3				7.95E-3
Slack Wax/Tallow Storage Tank T-67	A-13			9.21E-3				7.95E-3
Seal Water Storage Tank V-12	A-13			3.06E-3				3.06E-3
Resin Solids Drying Pad	A-13			0.65				0.65
Additive Truck Transload to Truck/Totes – Additive Loading	A-13			3.78E-4				0.0
Additive Truck Transload to Truck/Totes – BP-05 Loading	A-13			8.85E-4				6.47E-4
MEA Truck Transload	A-13			2.15E-3				0.0
Wax Loading (65,000,000 lb/yr Wax Production)	A-13			1.40E-3				4.31E-6

Source Name	Group A Category	Emissions (tpy)						
		PM/ PM_{10}	SO_2	VOC	CO	NO_x	HAPs	
							Single	Total
Additive Storage T-69	A-13			0.08				0.08
Slack Wax Storage Tank T-82	A-13			1.08E-2				9.33E-3
Q55BC-wd Tote Loading	A-13			0.10				0.102
TOTAL ALL A-13 SOURCES				0.95				0.95
Dowtherm A Tank DT-1	A-3							
Premix/Slack Wax Tank T-60	A-3			4.06E-3				3.38E-3
Wax Washwater Tank T-61	A-3			1.77E-4				1.74E-4
TEA Storage Tank T-62	A-3			5.17E-3				0.0
Stearic Acid Storage Tank T-63	A-3			1.50E-4				0.0
Formic Acid Tank T-85	A-3			3.24E-3				0.0
500 Gallon Diesel Storage Tank	A-3			1.25E-4				0.0
TOTAL ALL A-3 SOURCES				1.29E-2				3.55E-3
Sodium Hydroxide Storage Tank T-81	A-4							
Potassium Hydroxide Storage Tank T-82	A-4			0.0				0.0
Sodium Hydroxide Storage Tank M-3	A-4							

22. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

The following is a list of all active permits voided/superseded/subsumed by the issuance of this permit.

Permit #
1590-AR-23

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

Fee Calculation for Minor Source

Revised 03-11-16

Facility Name: Hexion, Inc.
Permit Number: 1590-AR-24
AFIN: 29-00125

				Old Permit	New Permit
$/ton factor	28.14		Permit Predominant Air Contaminant	51.2	51.2
Minimum Fee $	400		Net Predominant Air Contaminant Increase	0	
Minimum Initial Fee $	500				
			Permit Fee $	400	
Check if Administrative Amendment	☐		Annual Chargeable Emissions (tpy)	51.2	

Pollutant (tpy)	Old Permit	New Permit	Change
PM	8.2	8.2	0
PM_{10}	8.2	8.2	0
$PM_{2.5}$	0	0	0
SO_2	0.3	0.3	0
VOC	51.2	51.2	0
CO	39.5	39.5	0
NO_X	9.5	9.5	0
Formaldehyde	6.99	7.04	0.05
Phenol	0.81	0.81	0
Methanol	8.45	8.45	0
Triethylamine	4.54	4.54	0
Ethylene Glycol	0.49	0.49	0
Total Other HAPs	0.04	0.04	0
Formic Acid	1.03	1.03	0
Ammonia	3.44	3.44	0
Hydrogen Peroxide	0.08	0.08	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
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